

Report No. 16625-AM

# Republic of Armenia Transport Sector Review

(In Three Volumes) Volume II: Technical Report

May 30, 1997

Infrastructure Operations Division  
Country Department IV  
Europe and Central Asia Region



## CURRENCY UNITS and EQUIVALENTS

Dr	Dram - Introduced Nov. 22, 1993	US\$1 = 14	Dr	(November, 1993)
		US\$1 = 425	Dr	(October, 1996)
Rbl	Ruble	US\$1 = 2,600	Rbl	(October 1993)
US\$	US Dollar			
USc	US cent			

## WEIGHTS, MEASURES and OTHER UNITS

bln	billion
inh	inhabitant
kg	kilogram
km	kilometer
mln	million
pass	passenger
sq km, km <sup>2</sup>	square kilometer
t	ton (metric, 1,000 kg)
th	thousand
toe	ton oil equivalent
vpd	vehicles per day

## CONVERSION FACTORS

1 mile = 1.609 meters
1 kg = 2.205 lbs
1 US gallon = 3.785 liters
1 sq km = 0.386 square miles

## CHEMICAL COMPOUNDS

C <sub>x</sub> H <sub>y</sub> , HC	Hydrocarbons
CO	Carbon Monoxide
CO <sub>2</sub>	Carbon Dioxide
NO <sub>x</sub>	Nitrogen Oxides
SO <sub>2</sub>	Sulfur Dioxide

## FISCAL YEAR

January 1 - December 31

Vice President:	Johannes Linn, ECAVP
Director:	Basil G. Kavaksly, EC4DR
Division Chief:	Dominique Lallement, EC4IN
Task Manager:	Pedro N. Taborga, EC4IN

## GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ATC	Air Traffic Control
ARD	Armenian Road Directorate
CIF	Cost-Insurance-Freight
CIS	Commonwealth of Independent States
CLAU	Caucasus Logistics Advisory Unit
CMEA	Council for Mutual Economic Assistance
COTIF	Bern Convention of May 9, 1980
EBRD	European Bank for Reconstruction and Development
ECAC	European Civil Aviation Conference
EDI	Electronic Data Interchanges
ESAF	Extended Structural Adjustment Facility
EU	European Union
FIATA	Fédération Internationale des Associations des Transitaires et Assimilés
FOB	Free-On-Board
FSU	Former Soviet Union
GATT	General Agreement on Tariffs and Trade
GDCA	General Department of Civil Aviation
GDI	Gross Domestic Investment
GDP	Gross Domestic Product
GNP	Gross National Product
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IMF	International Monetary Fund
L/C	Letter of Credit
MNEP	Ministry of Nature and Environment
MOT	Ministry of Transport
NEAP	National Environmental Action Plan
OECD	Organization for Economic Cooperation and Development
PIP	Public Investment Plan
SAC	Structural Adjustment Credit
SEPA	State Enterprise of Special Assignment
SGS	FSU Railway Association
SMGS	USSR Rail Waybill
SOE	State Organizations and Enterprises
STF	Systemic Transformation Facility
SZD	FSU's Soviet Union Railways
TACIS	Technical Assistance for Commonwealth of Independent States
TIR	International Road Transport
VAT	Value Added Tax
WTO	World Trade Organization

---



## **ACKNOWLEDGEMENTS**

The Review is based on findings of a World Bank mission which visited Armenia in October, 1996. The members of the mission were P. N. Taborga (mission leader); Anders Bonde (Highway Specialist); Alexis Bonnel (Financial Analyst); Jean-Paul Desgranges (Aviation Specialist); Parbo Juchnewitsch (Railway Reform Specialist); Paul van der Lande (Environmentalist); Rene Meews (Containerization Specialist); Cyril Muller (Regional Issues); Robert Nooter (Transport Economist) and Ovadia Salama (Transport and Trade Facilitation).

M. Henry Kochinian, Minister of Transport, was the main counterpart of the mission on the Armenian side. The study has relied heavily on official sources of information and statistics as well as interviews and meetings with Government ministries and agencies. It also draws on the Armenia Structural Adjustment Credit operation, on-going World Bank and IMF work on the macro-economic conditions of the country, other sector work, studies supported by EBRD, EU and UN-WFP, and findings from various World Bank missions.

---



# ARMENIA

## TRANSPORT SECTOR REVIEW

### TABLE OF CONTENTS

#### I. INTRODUCTION

A.	Purpose of the Study .....	2
B.	Organization of the Study .....	3

#### II. TRANSPORT AND ECONOMIC ADJUSTMENT

A.	Structure of the Economy .....	5
B.	Macro-economic Performance .....	6
C.	Role of the Transport Sector .....	11

#### III. THE REGIONAL CONTEXT OF TRANSPORT DEMAND

A.	The Transport Sector in the Regional Context .....	15
B.	The Transport Sector in a Changing Economic Situation .....	17
C.	Growth Scenarios .....	19
D.	Historic and Projected Traffic .....	21

#### IV. TRANSPORT AND TRADE FACILITATION

A.	Overview .....	25
B.	Excess Costs and Corrective Actions by Physical Source .....	26
C.	Further Benefits - Trade and Welfare Gains .....	40

#### V. ROADS AND ROAD TRANSPORT

A.	Road Infrastructure .....	42
B.	Road Transport Services .....	55

#### VI. ARMENIAN RAILWAYS

A.	Organization and Staff .....	64
B.	Physical Description .....	66
C.	Traffic Levels .....	68
D.	Railway Operations .....	73
E.	Legal Framework of Labor Relations .....	76
F.	Financial Issues and the Need for Restructuring .....	77

## **VII. CIVIL AVIATION**

A.	Overview.....	84
B.	Institutional Organization of the Sub-Sector .....	86
C.	Airline Operations.....	89
D.	Airport Infrastructure and Facilities.....	92
E.	Air Traffic Control .....	94
F.	Financial Issues and the Need to Restructure .....	94

## **VIII. TRANSPORT, ENVIRONMENT AND RESETTLEMENT**

A.	Transport and the Environment .....	106
B.	Involuntary Resettlement.....	111

## **IX. RECOMMENDATIONS**

A.	Overview.....	113
B.	Sector Adjustment.....	114
C.	Investment Priorities and Possible Bank Assistance .....	124

### **ANNEX 1 Multimodal Transport and Containerization in Armenia**

### **ANNEX 2 Proposed Investment Plan for the Armenian Railways**

### **MAP 1**

## **STATISTICAL APPENDIX**

---

## I. INTRODUCTION

1.1 Armenia is a small landlocked country in the southern part of the Caucasus with a land area of 29,800 square kilometers. Turkey lies to the west, Georgia to the north, Iran to the south and Azerbaijan to the east. It became independent on September 23, 1991, as the Soviet Union disintegrated. Since then, Armenia has faced several political and economic challenges. Despite few resources and stony land, its ethnically homogenous 3.7 million people (including about 400,000 refugees from Azerbaijan and Karabakh) have survived through a high level of education, strong entrepreneurial traditions and trade with those around them. Armenia is the second most densely populated country of the FSU. About 67 percent of its population is classified as urban, and its capital, Yerevan, has about 1.4 million inhabitants. Armenia's GNP per capita was \$570 in 1995, making it one of the poorest countries of the FSU.

1.2 Under the Soviet system, Armenia's production structure was highly dependent on trade with the rest of the FSU (exports and imports represented more than 50 percent of GDP during the 1980s) and on industry (60 percent of GNP). Armenia was producing large volumes of light industrial goods (40 percent of total exports in 1991), but also exporting substantial quantities of heavy industrial products as well as food-stuffs and semi-finished goods, mainly for the Soviet market. In the absence of raw materials and primary processing facilities, Armenia had to rely heavily on imports of semi-finished goods and critical inputs, particularly primary energy resources.

1.3 The economic situation in Armenia, already altered by the effects of the 1988 earthquake, which killed more than 25,000 people and made 500,000 homeless, deteriorated sharply after Independence. First, the collapse of regional trade, payment and financial agreements with other states of the FSU and the resulting terms of trade shock dealt a severe blow to the economy. The high degree of Armenia's integration into the FSU economy, the elimination of non-market pricing in trade between FSU states, the subsequent rise in energy import prices and the lack of comparative advantage of significant parts of Armenia's productive base further aggravated the economic downturn. Second, the conflict in the Nagorno-Karabakh region as well as other regional conflicts led to a transport blockade with Azerbaijan (traditionally Armenia's principal transit route for oil, gas and other products), the closure of the Turkish border and serious obstacles for transport to and through Georgia. Last but not least, the task of dismantling the central planning system and replacing it with a market economy proved more difficult than anticipated. This situation induced a dramatic decline in output (between 1991 and 1993, GDP dropped by about 60 percent) accompanied by hyperinflation, falling real wages and drastic energy shortages, causing hardship to the population despite the Government's efforts to maintain a social safety net.

1.4 Since 1994, the situation has improved markedly. On the political front, a cease-fire in the Nagorno-Karabakh region since mid-1994 and efforts to reach a permanent peace settlement have improved stability. Furthermore, several recent positive developments in Armenia's relations with its neighbors are easing tensions in the region. However, trade with Azerbaijan and Turkey is still disrupted and the blockade at their borders continues to place a heavy burden on the economy

both in terms of high transport costs and the limited availability of goods, including essential raw materials for industry.

1.5 On the economic front, the Government of Armenia has undertaken widespread reforms to restructure the economy to allow the market forces a greater role in allocating resources. Financial policies have been tightened, public expenditures limited to priority items, central bank financing of the fiscal deficit curtailed and a privatization process implemented. Accordingly, low inflation and broad stability in the exchange rate has enhanced confidence in the new Armenian currency, and, after the huge decline in GDP during 1991-1993, growth of 5.4 and 6.9 percent were recorded in 1994 and 1995 respectively. Armenia was one of the few countries of the FSU to report economic growth in 1994. The relative political stability and the commitment to economic reform were recognized in the approval by the World Bank of a Structural Adjustment Credit (SAC) on February, 1996.

1.6 The pattern of transport in Armenia was deeply altered by the shift in trade routes and the change in trade partners following both the collapse of the Soviet Union and the economic blockade. As a result, and even today, despite encouraging trends, getting goods in and out of the country is a formidable problem, with transport costs amounting to significant shares of the final cost of many products. Furthermore, given the scarcity of resources at the disposal of the Government and institutional difficulties within the sector, it has been impossible to stop the erosion of existing infrastructure, let alone the removal of key transportation bottlenecks that are hampering economic recovery and the development of the country's comparative advantages.

1.7 Armenia's transport sector consists of 7,800 km of roads (excluding municipal, agricultural and forestry roads), 840 km of broad gauge, electrified, railroad tracks, and five paved airfields, one of which is of international standard. In addition, the vehicle fleet consists of about 240,000 passenger cars, 30,000 trucks and 4,000 buses. Recent efforts and support from external donors in the transport sector include the World Bank Highway Credit (approved in August, 1995), which aims at expanding maintenance for the main road network and improving the efficiency of road maintenance operations, and an EBRD-financed project to build a new cargo terminal at Zvartnots airport in Yerevan.

### **A. Purpose of the Study**

1.8 This study has been carried out as a direct response to the Government's request to develop a program of assistance in support of a comprehensive transport strategy, with emphasis on the following objectives:

- a) identifying key policy reform;
- b) reviewing and accelerating the privatization program in the sector; and
- c) formulating action plans for restructuring railways, managing road infrastructure, reorganizing civil aviation and urban transport.

1.9 In addition to meeting the above objectives, the study identifies priority expenditures suitable for inclusion in a Government Public Investment Plan (PIP) and eventual discussion with other donors.

1.10 The study has relied heavily on official sources of information--statistics as well as interviews and meetings with Government ministries and agencies. It also draws from past and ongoing World Bank and IMF economic work, other sector reviews, e.g., trade, agriculture, in addition to studies being carried on behalf of EU, EBRD, UN-WFP and findings from various World Bank missions.

## B. Organization of the Study

1.11 The study is presented as nine chapters, 2 annexes, and a statistical appendix. The chapters are as follow:

1.12 **Transport and Economic Adjustment.** Chapter II gives a summary description of Armenia's economic situation, current constraints and agenda for reform, followed by a discussion on the role of the transport sector and its possible contribution to economic recovery. The current situation of the transport sector, its cost recovery performance, lack of mobilization of resources and inappropriate investment plans are highlighted, and the potential for transport and trade facilitation explored.

1.13 **The Regional Context of Transport Demand.** In Chapter III, the future transport demand of Armenia is explored and analyzed, and the link with macro-economic and sector reform made. Particular attention is given to possible growth and trade development scenarios depending on the degree of easing of the regional political situation.

1.14 **Transport and Trade Facilitation.** Chapter IV addresses the barriers to transport and trade, the costs they impose on the economy, and the facilitation measures required to alleviate them. The potential of transport as an internationally traded service, implications of facilitation measures on the balance of payments, and their costs and benefits are also catalogued.

1.15 **The Road Sub-Sector.** Chapter V covers the current situation, main issues and financial problems of the sub-sector. The presentation is organized as follows: a) Road Infrastructure; and b) Road Transport Services. In addition to discussing privatization of bus and truck fleets, the restructuring of the Yerevan subway is reviewed.

1.16 **Railways.** Chapter VI addresses the many issues faced by the Armenian railways. It gives a description of the physical condition of the railways, nature and quality of operations, current traffic and prospects, and main and financial issues. Institutional performance is forecast with and without restructuring to illustrate the path of possible recovery for the railways.

1.17           **Civil Aviation.** Chapter VII gives an account of the present situation for civil aviation, its institutional issues and organizational characteristics, priorities in fleet renewal, infrastructure and air traffic control and financial difficulties. The potential for institutional and financial restructuring in addressing the problems of the sector closes the chapter.

1.18           **Transport, Environment and Resettlement.** Chapter VII covers the current situation, legislation and institutional authorities with jurisdiction over environmental and resettlement questions arising in the transport sector. The presentation is made in two sub-chapters, Environment and Resettlement. After reference to relevant legislation, recommendations concerning standards and norms and their future applications close each of the sub-chapters.

1.19           **Recommendations.** Chapter IX gives a recompilation of the specific sub-sector recommendations. Under a scenario of continued economic reform and easing of regional tensions, the recommendations are presented under the following headings:

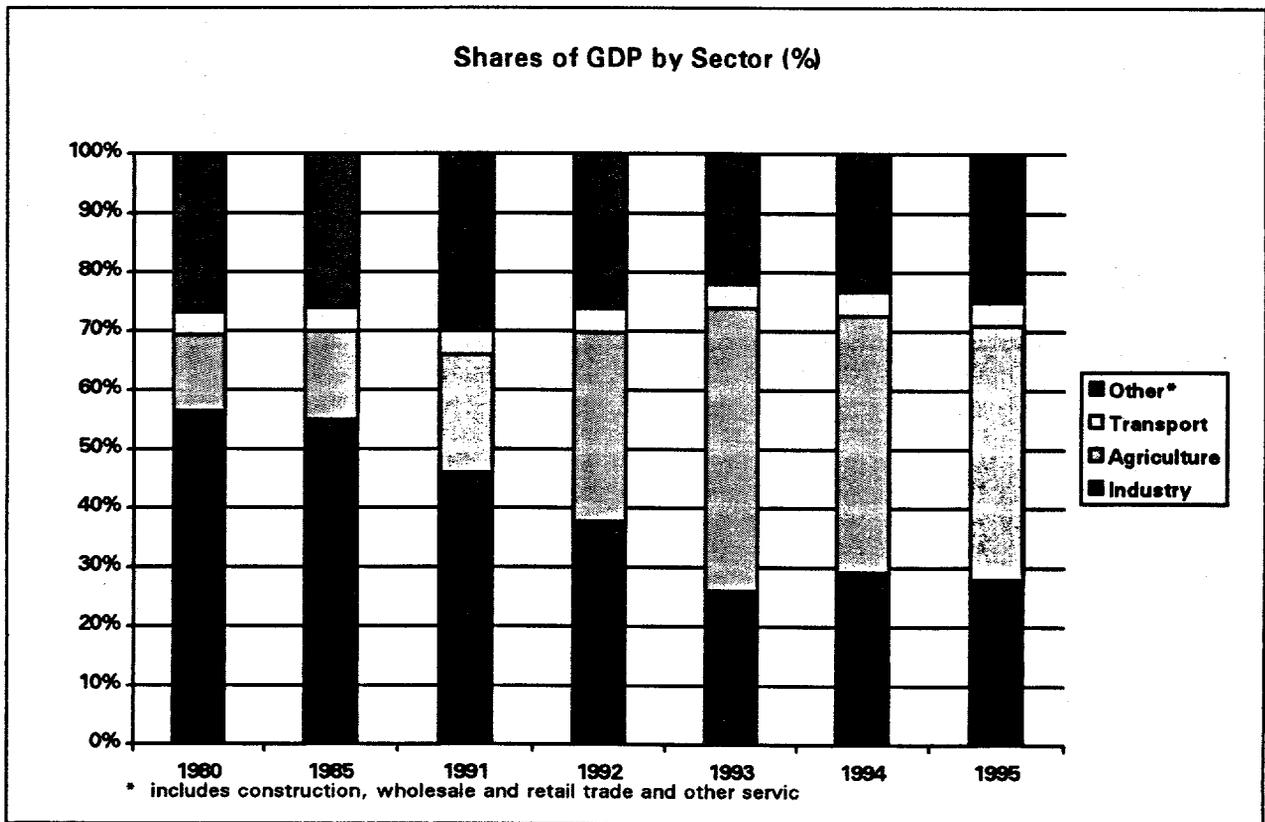
- a)     Policy Reform
  - b)     Transport and Trade Facilitation
  - c)     Sub-sectors
  - d)     Investment Priorities and Possible Bank Assistance
-

## II. TRANSPORT AND ECONOMIC ADJUSTMENT

### A. Structure of the Economy

2.1 Before Independence, the economy of Armenia was largely industrial --chemicals, electronic and optic products, machinery, processed food, synthetic rubber and textiles-- and highly dependent on outside resources. Armenia has a small amount of mineral resources (copper, molybdenum, gold) and its agriculture accounted for only 20 percent of GDP and 10 percent of employment before 1991. Most energy and materials for industry as well as most agricultural goods were imported from other Soviet republics. This structure of production, a legacy of Soviet central planning, was not always justified in terms of comparative advantage.

2.2 The economic structure of Armenia has been largely reshaped since Independence, as seen in Figure II.1. Each sector of the economy has been affected by the problematic availability of essential raw materials and energy, severe shocks from price adjustments to world levels, and structural reforms undertaken throughout the economy. Unlike the Soviet era, when imports supplied the needs of the economy, Armenia has basically had to rely on domestic production and humanitarian aid (mainly consisting of wheat, rice and fuel). Adding to these problems, physical infrastructure is deteriorating at a fast pace due to lack of funds for maintenance.



**Figure II. 1** Sources: Trends in Developing Economies, The World Bank, 1994; IMF; U.S. Government and Mission Estimates

2.3 Historically, transport has amounted to about 4 percent of GDP. Transport flows reflect the recent evolution of the economy: despite recent modest growth, total public and private tonnage transported in 1995 represented no more than 10 percent of 1991 levels (see Chapter III). Transport-sector specific issues, including the worsening condition of transport infrastructure, slow progress towards privatization and resulting high transportation costs, represent obstacles to economic stabilization, transformation and recovery.

2.4 Armenia has significant strengths. It has become politically stable and market oriented, with some of the most liberal trade regulations in the CIS. It is endowed with a well educated, highly qualified and currently under-employed labor force and can draw upon its trade and entrepreneurial traditions as well as the strategic importance of its location in Transcaucasia. In addition, it has developed a manufacturing industrial base and a relatively good transport and communications infrastructure, albeit with some serious deterioration problems. Last but not least, the importance of the Armenian Diaspora (there are some seven million Armenians throughout the world, including one million in the United States) represents a key asset to attract foreign investment into the country. The pace of economic recovery will now depend on how well the necessary macro-economic and sector specific reforms are designed and implemented.

2.5 The *structural constraints* expected to be removed as a result of economic reform include:

- Resource intensiveness of energy, transport and industry, as prices increasingly reflect economic costs.
- Deterioration of physical and social infrastructure as a result of systematic cost recovery and emphasis on maintenance and priority rehabilitation.

2.6 The *primary institutional constraints* to be addressed relate to:

- Economic management, which needs to be strengthened to allow the timely implementation of the reform program.
- Financial management of enterprises, which needs to be restructured to respond to the new situation.
- The financial sector, where intermediation and credit assessment capacity needs to increase.

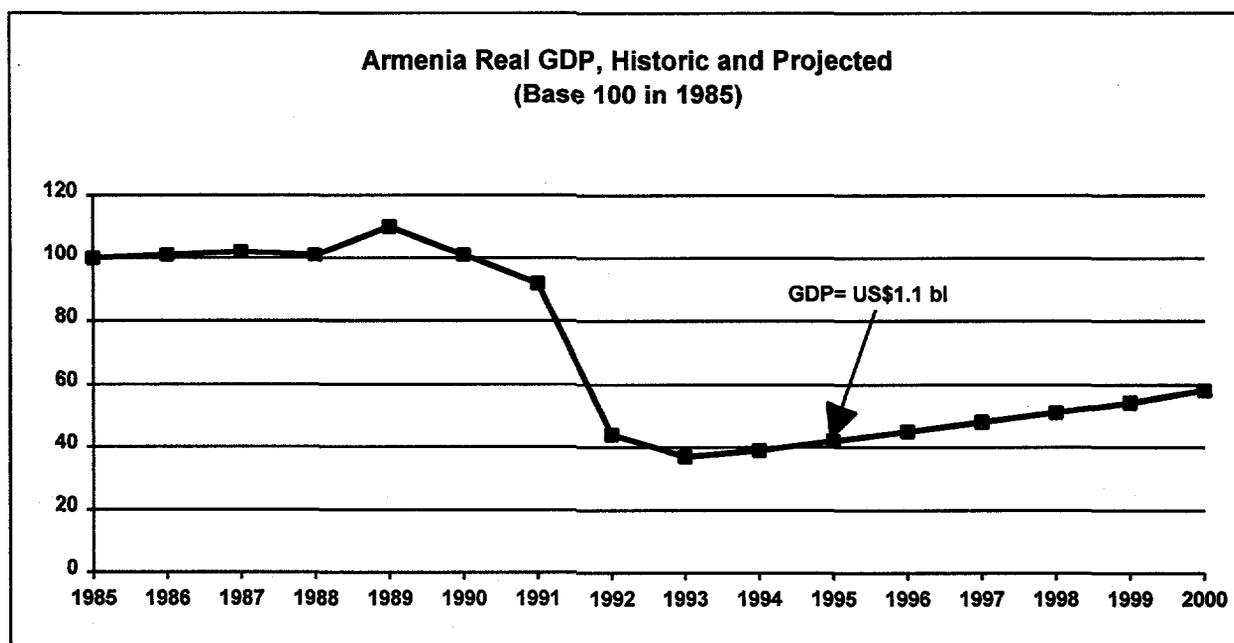
## **B. Macro-Economic Performance**

2.7 Armenian GDP fell by about 60 percent between 1991 and 1993, reflecting the economic and geopolitical difficulties. The year 1994 marked a watershed in the economy. Following the cease-fire between Azerbaijan, Nagorno-Karabakh and Armenia, the Armenian

Government turned to the international community to seek assistance for the reconstruction of its shattered economy.

**2.8 Reform Program and External Support.** Supported by resources under the IMF's Systemic Transformation Facility (STF) beginning in December 1994, a Stand-by Agreement (SBA) approved in June 1995, and a Rehabilitation Credit from the World Bank in February 1995, the authorities began to implement austere fiscal and monetary policies accompanied by widespread structural reforms to achieve sustained price stability and economic growth. The implementation of these reforms and increased regional stability fostered growth in 1994 and 1995 (5.4 and 6.9 percent respectively, see Figure II.2 below).

**2.9** The 1996 program, supported by an IMF Extended Structural Adjustment Facility (ESAF) and a World Bank Structural Adjustment Credit (SAC), has focused on deepening the process of structural reforms. The Government has initiated reforms in public administration by undertaking measures to restore public sector pay, rationalize the structure of the Government and limit budget-financed employment. It is also in the process of reforming the health and education sectors with a view to increase cost recovery and private sector participation. At the same time, the Government has taken actions to increase financial discipline by eliminating clearing trade with Turkmenistan, restructuring the energy sector and increasing collection rates, and reforming and consolidating the financial sector. Financial discipline is also strengthened by the acceleration of privatization: over 3,400 small-scale and 900 medium and large enterprises have been privatized to date.



**Figure II. 2**

Source: IMF, World Bank SAC and Mission Estimates

**2.10 Implications for Growth.** Actual growth during the first six months of 1996 is estimated at 4.3 percent, and growth of 6.5 percent is expected for the full year. However, it is not clear how much of this growth is due to the slow healing of the least damaged sectors of the

economy, to new and vigorous production renaissance and/or to the fact that fiscal and structural reforms throughout the economy tend to reintegrate into official GDP statistics many informal activities that have developed since Independence.

2.11 For this economic revival to be sustained and accompanied by growth in new sectors, the Government needs to continue to pursue policies that lay the foundations for a market economy and reduce the role of the State in production and distribution. Private sector output has already increased from a little over 12 percent of GDP in 1990 to 44 percent in 1995, and, if further encouraged, this trend would continue to provide the basis for continued economic growth. Expansion of trade and the development of the service sectors would also contribute to positive growth. Under a sustainable growth framework for Armenia, GDP would increase by 6 to 7 percent per year, as projected in Figure II.2.

2.12 **Currency, Inflation and Wages.** Until November, 1993, Armenia used the Soviet ruble as its currency. On November 22, 1993, the Government introduced its own currency, the Dram (valued at 14 Dram to the dollar). However, the Dram soon lost its value and by the end of 1993, it had sunk to 75 Dram/US\$. The depreciation of the Dram thereafter accelerated and by the end of 1994, the exchange rate was 405 Dram/US\$. Inflation in 1994, as measured by the Consumer Price Index (CPI), was 1,884 percent. Reflecting the slowdown in monetary aggregates under the reform program supported by the IMF and the World Bank, inflation declined in 1995 to 31.9 percent and to only 5.6 percent in the first six months of 1996 (see Table II.1 below).

	1993	1994	1995	1996*
End-of-Period Inflation	—	1,884	31.9	5.6
Exchange Rate, End-of-Period (Dram/US\$)	75	405	403	420
Exchange Rate, Average (Dram/US\$)	—	287	406	410
<b>Wages (in US\$)</b>				
Minimum Monthly Wage	—	1	2	2
Average Monthly Wage – State Sector	—	7	15	20
Average Monthly Wage – Transport Sector	—	16	24	35

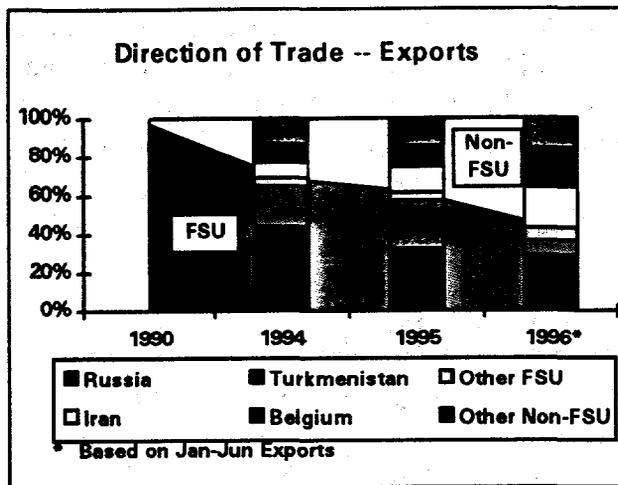
\* Jan-Jun data

**Table II. 1** Source: Armenian State Department of Statistics, IMF and Mission estimates

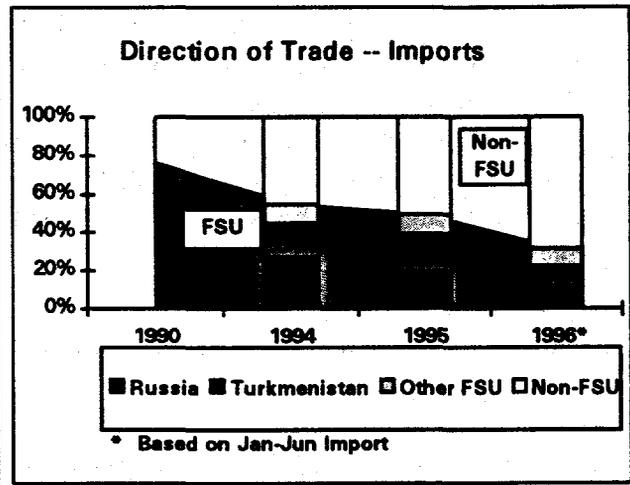
2.13 As experienced in most FSU countries, wages in Armenia plummeted between 1992-94, falling by 42 percent in 1993 and an additional 76 percent in 1994. State sector real wages, however, began to recover in 1995, increasing by 18 percent. Recent efforts to downsize Government employment have been accompanied by wage increases. Wages vary considerably among sectors in the economy and although the disparity appears to be decreasing, recorded transport sector wages were at 14,800 Dram/month (US\$35/month), or about 1.7 times the State sector average wage. Table II.1 shows key currency, inflation and wage statistics.

2.14 **Foreign Trade.** Trade traditionally was and still remains particularly significant to the economy of Armenia. The value of imports represented about 62 percent of GDP in 1995, while exports amounted to 25 percent of GDP. The market for Armenia's products was predominantly in other republics of the FSU, chiefly Russia. Armenia also overwhelmingly relied on the FSU for its economic inputs. Partly as a result of deliberate decisions over decades by Soviet economic planners, Armenia had become heavily dependent on "external" trade, but only minimally with partners outside the FSU.

2.15 Armenians now realize that they enjoyed a protected market in the FSU for many of their goods and services. While they remain confident that these markets will be open to them in the future, they now have other options to satisfy their needs, as seen in the sharp increase of non-FSU trade since 1991 (see Figures II.3 and II.4 below).



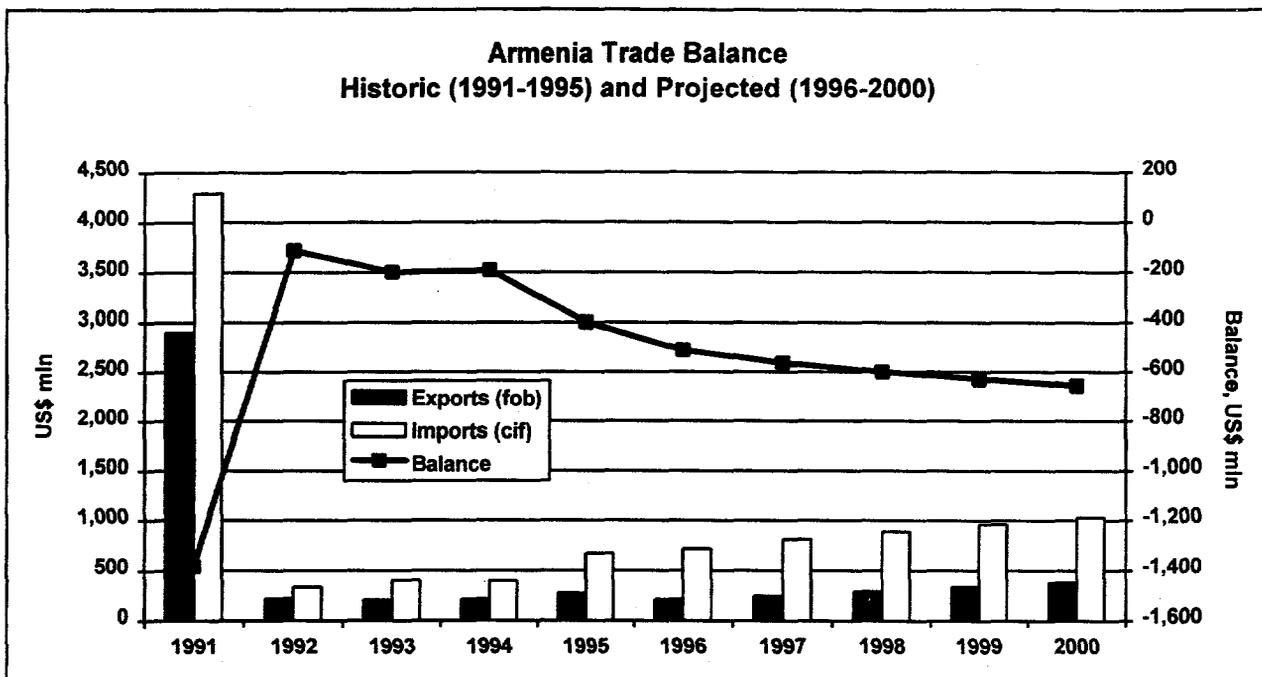
**Figure II. 3**  
Sources: USSR Statistics, IMF



**Figure II. 4**

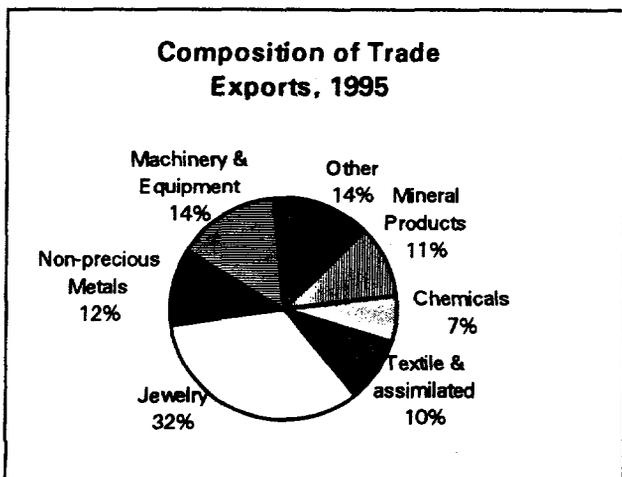
2.16 Trade volumes in Armenia sharply decreased after Independence, reflecting the drastic geopolitical and economic changes. In 1991, total trade was about US\$ 7.2 billion, whereas in 1995, it amounted to only US\$ 0.9 billion<sup>1</sup>. In the past two years, however, increased regional stability and trade liberalization steps have reversed the trend and active trade with neighboring countries, although largely unrecorded (in particular with Turkey, whose border with Armenia is still officially closed), is taking place. Figure II.5 below pictures the historic and projected evolution of trade in Armenia.

<sup>1</sup> The development of informal trade after 1991 is not recorded in export and import statistics. Trade volumes might actually be higher than indicated by the official accounts.

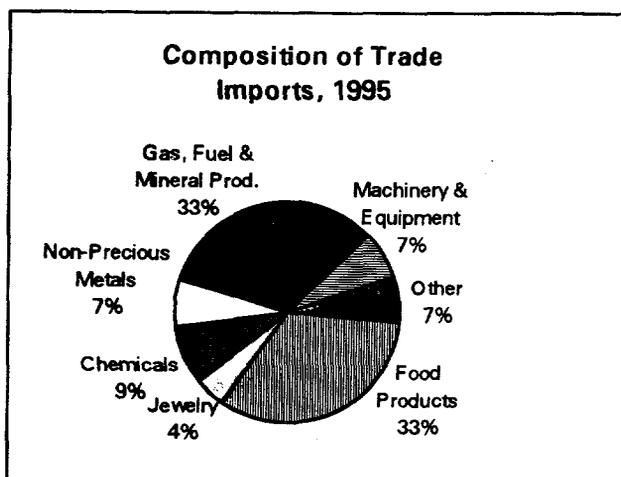


**Figure II. 5**  
Source: Trends in Developing Economies, The World Bank, 1994; IMF and Mission Estimates

2.17 In 1995, most of Armenia’s exports were relatively low-technology, high-value added commodities, notably jewelry. Gold and diamonds are imported from Russia for processing, and re-exported to the West. Jewelry accounted for about one third of total exports in 1995 and the first six months of 1996, while machinery and equipment accounted for about 14.6 percent in the second quarter of 1996. Other main exports include textile products, shoes and hats (see Figure II.6 and II.7). On the import side, the main imports are food products related to humanitarian aid (33 percent of total imports in 1995) and gas and fuel, which accounted for over 30 percent.



**Figure II. 6**  
Sources: State Department of Statistics, IMF



**Figure II. 7**

2.18 Changes in Armenia's trade patterns are likely to continue although some features of the previous system may persist. Armenia's comparative advantages in light manufacturing (textiles, jewelry) as well as in machinery and equipment are still expected to play a significant role. The development of service-oriented businesses, including tourism, is also likely to develop and benefit from the country's substantial human resource potential.

2.19 Once political stability is confirmed and relations with neighboring countries improve, Armenia may also return to a role as a crucial link in a land corridor between Europe and Asia by providing transit facilities for oil and gas pipelines from Central Asia and container transit traffic for trade between Europe, Central and Eastern Asia, and the Persian Gulf. However, the present competition by corridors through Russia and/or Turkey and Georgia and the fact that Armenia has not been able so far to take advantage of its strategic location needs to be kept in mind (see Chapter III). Hopefully, competition rather than political factors will determine the most effective routing.

### C. Role of the Transport Sector

2.20 **The Transport Sector Before Independence.** Prior to Independence, Armenia's transport system was closely integrated with that of the FSU, and the country served as an important transit channel for the other republics of the Caucasus. The transport system characteristics in Armenia were determined by central authorities in Moscow and reflected patterns encountered throughout the FSU. These included: (a) overuse of transportation because of planned separation and specialization of production units in a few locations; (b) over-reliance on rail transport, especially for short hauls; (c) centralized control of investments affecting all international transport; (d) technical competence of administrative and managerial structures, coupled with unfamiliarity of benefit/cost and other market-based analyses; and (e) the almost exclusive use of transport equipment made within the Council for Mutual Economic Assistance (CMEA) trading area, equipment that typically was not efficient by world market standards.

2.21 Armenia also made use of the same institutional arrangements for its transport system that were the pattern generally in the FSU: the Ministry of Transport received budgetary proposals of various enterprises in the transport sector, setting their charging policies and the level of mandatory payments to the Government, authorizing investments and providing support from general Government finances if revenues were inadequate. In addition, the aviation fleets were based in airports and operated as combined enterprises with them; freight booking and follow-up was handled through central organizations; transport enterprises typically provided many social services (health, education, etc.) to their staff at little or no cost; and the design, construction and maintenance of roads and other infrastructure was carried out by semi-independent units that were not subject to competitive discipline.

2.22 **Current Situation.** The transport sector has particularly suffered from the economic and geopolitical hardships Armenia has endured since Independence, including the

transportation blockade imposed by Turkey<sup>2</sup> and Azerbaijan have severely altered transport patterns in the country. During the past four years, traffic volumes on most modes of transport declined sharply: about one tenth of 1990 total (public and private) tonnage transported was observed in 1995, while public and private passenger transport flows in 1995 were at about 50 percent of 1990 levels (see Chapter III). The decline is even larger when considering public transport only: 1995 public freight traffic was at only 3.5 percent of 1990 levels and public passenger transport flows at 32 percent of 1990 traffic. While modest traffic growth was recorded in 1995 owing to economic recovery, transport demand still represents a small fraction of what it was in 1990.

2.23 Little, if any, maintenance (even basic routine maintenance) is being done. The impression is that the transport system is “existing on its capital stock”. The asset base is eroding, equipment and rolling stock are aging and delayed maintenance and rehabilitation keeps accumulating. Throughout the sector, repair facilities and rolling stock are in need of a substantial overhaul. The situation may, within the next five years, deteriorate to the point at which maintenance and rehabilitation are no longer possible. If this occurs, the only option will be costly and complete reconstruction.

2.24 The sector still operates under many of the organizational and policy structures of earlier days. Practically all transport enterprises and infrastructure sub-sectors, including the national road network, the railway company, the national airline, several airports, the civil aviation department, the Yerevan Metro system, an extensive array of municipal and long distance bus, trucking and taxi enterprises, as well as many organizations involved in transport-related maintenance and construction, are still State-owned units reporting to the Ministry of Transport. Also, many of them do not operate as independent, self-financing and commercially viable entities.

2.25 Severe budget constraints added to the financial difficulties of the sector, leading to sharp cuts in maintenance expenditures. Pervasive in the sector is the absence of meaningful cost recovery and resource mobilization, with the inevitable consequence of unfunded operating entities, poor service and a degradation of infrastructure and equipment. The effects of the deterioration of the transport sector are being felt by other economic sectors that rely upon it.

2.26 Since 1994 and the beginning of economic recovery, several steps have been taken to address the difficulties of the sector. A US\$16 million, World Bank financed Highway Credit aiming at increasing the level of maintenance for the main road network and at improving the efficiency of future maintenance operations was approved in 1995. Also, following the elimination of most subsidies for public transport companies and the privatization of several taxi companies and a few bus companies, the Government plans to privatize all trucking, taxi and some bus companies soon. However, privatization of trucking and bus transport, according to the 3-year privatization program adopted in 1994, has been delayed. Armenian authorities also intend to retain ownership of the railway, the metro system and the national airline, while encouraging the entry of private airlines.

---

<sup>2</sup> Recent and encouraging progress on this issue might lead to a border opening with Turkey by 1997.

2.27 The sector needs to move towards faster privatization and much greater use of the market mechanism than previously. The present reduced economic activity provides a convenient time in which to effect the institutional changes necessary. The period before the economy recovers at a sustained pace may be limited, and the sector may need to be restructured to be able to perform under increasing traffic volumes. Armenian officials are beginning to accept the logic and inevitability of the changes that will be needed, and there is evidence that they also realize the extent to which their roles and responsibilities will be altered.

2.28 The major issues related to the transportation industry are:

- the erosion of the asset base of the transport sector, and mounting maintenance, rehabilitation, and renewal backlogs as well as technical innovation and equipment upgrading that are not yet being addressed;
- the slow pace of reform in the sector, including the restructuring, commercialization and privatization of transport operations;
- the need to reach full cost recovery by means of a combination of road user charges and elimination of price controls, leading to market determined tariffs;
- the adoption of transport and trade facilitation measures to reduce trade costs.

2.29 This implies the need to define a new role for the Government vis a vis transport, where ministerial functions are policy making, formulation and enforcement of safety and environmental regulations. Operations, construction and maintenance would be functions to be performed by independent commercial entities across the sector.

2.30 **Transport in the Balance of Payments.** The balance of payments account (see Table 2.1, Statistical Appendix, and Figure II.5 above for historic and projected trade balances) is, in the case of Armenia, the only source of internationally comparable information on international service transactions, including transportation. This views transport as an internationally traded service, as opposed to a simple support to the production function or a social service to consumers.

2.31 Armenia is a net importer of transport services. The services balance for 1995 shows a deficit of US\$ 70 million for freight and travel services, representing 70 percent of the overall service transactions deficit. Transport is therefore the largest item in the service balance in Armenia. These characteristics reflect the unusually high transportation costs experienced in Armenia. They are likely to remain unchanged unless the cheapest transport options are searched for in support of trade development.

2.32 With the removal of unnecessary transport costs to trade, significant direct savings could be obtained. The example of freight factors is particularly demonstrative of such potential savings. Freight factors, defined as the proportion of freight costs to merchandise value, are significantly higher in Armenia than in Western Europe or even other FSU republics. The overall freight factor, i.e. the ratio of the absolute sum of freight debits and credits to total merchandise value is 12 percent ad valorem for overall merchandise foreign account transactions in Armenia. This is about 8 times the freight factor for Europe<sup>3, 4</sup>.

2.33 Freight factors are high throughout the FSU. If they could achieve the European Union (EU) averages, Estonia could improve its balance of payments surplus/deficit by about 17 percent, Lithuania by 25 percent, Turkmenistan by 30 percent, Belarus by 100 percent, Moldova by 35 percent and in the case of Armenia by 21 percent. Considering Armenia's US\$944 million merchandise flow in 1995, this discrepancy represents a potential loss of about US\$100 million<sup>4</sup>.

2.34 A refined study on direct excess costs to trade and transport is carried out in Chapter IV (Transport and Trade Facilitation). The study is based on an analysis of total non-factor services debits and credits and on detailed excess-cost estimates for each barrier to trade and transport identified. Total actual excess costs resulting from such barriers to trade are estimated at about US\$65 million annually as a minimum (see paras. 4.4 and 4.5). Given the importance of transport to the development of Armenia's economy, any efficiency gains in the sector would contribute both to macro-economic stabilization and further development of trade.

---

<sup>3</sup> For the 1988-1991 period, the freight factor for the European Union was 1.5%.

<sup>4</sup> This analysis, however, should be regarded as purely indicative and all figures presented interpreted with caution. At least two elements, not related to direct excess-costs to trade and transport, partly explain the large discrepancy between Armenian and Western European freight factors.

First, a significant share of imports in Armenia consist of humanitarian aid, whose cost to the country is in some cases limited to that of its transportation. Because they represent grants, the inclusion of the value of humanitarian aid shipments in trade account statistics remains unclear. If these grants are indeed not accounted for, humanitarian aid transactions effectively increase freight debits without really affecting total import values as they appear in the balance of payments. Accordingly, the freight factor ratio is artificially increased.

A second partial explanation of the high freight factors observed in Armenia is linked to the blockade of the country, and the fact that an unusually high share of cargo imports and exports was carried out by air in 1995, even for short distance shipments. High freight factors would then be partly due to forced transport modal (mis)allocation because of regional instability.

Nevertheless, even when accounting for these two distortions, freight factors in Armenia remain several times higher than those observed in Western Europe.

### III. THE REGIONAL CONTEXT OF TRANSPORT DEMAND

#### A. The Transport Sector in the Regional Context

3.1 Armenia as a small landlocked country is heavily dependent on its neighbors' transport networks and policies. Well developed transport networks in neighboring countries and open access to these networks would foster Armenia's external trade and contribute to economic growth. Being a small landlocked country in itself need not be an impediment to trade expansion and economic growth. Well-known examples of successful landlocked small open economies are Switzerland and Austria. In the case of Switzerland and Austria, the development of transport networks, in particular the North-South European transport corridor through the Alps, has led to a perception that these two countries benefit from a favorable geographic location, being at a crossroads rather than being landlocked.

3.2 Armenia could be in a comparable situation, with the possible development of major North-South and East-West transport corridors either through or in the vicinity of Armenia. However, serious constraints impede the realization of this potential at present. First, conflicts in neighboring countries and the trade blockade by Turkey and Azerbaijan limit in the short term Armenia's choices of trading routes. Second, Armenia's national transport network was part of the integrated Soviet Union network, which gave priority to domestic transport linkages and was designed without taking into account current borders. Third, the Soviet Union as a mostly closed economy developed very few international transport routes. Finally, the fourth constraint concerns the openness of neighboring economies to facilitate trade and investment in Armenia.

3.3 **Conflicts in Neighboring Countries.** Armenia's transport possibilities are constrained by the conflicts over Nagorno-Karabakh, Nakhichevan, Abkhazia, South Ossetia, and Chechnya. The border closing with Azerbaijan has meant that the major Northern rail transport route (through Baku) has been unavailable for the last seven years, limiting international cargo rail transport to the axis Yerevan - Tbilisi - Batumi/Poti. Similarly, the major international road axis linking Armenia with Georgia, Azerbaijan and Russia, remains closed. Access to Iran is also severely restricted because of the closed border in Nakhichevan, where main rail and road links to Iran are located. Transport to Iran is only possible by a road in very poor condition (needs extensive rehabilitation if it remains the main link to Iran, and is sometimes closed during Winter), and is further hampered by the distance to the Iranian port of Bandar Abbas (2,200 km from Yerevan). Difficult access to Iran implies difficult access to the rest of the Middle East, the Persian Gulf ports, and Central Asia.

3.4 Although the Turkish blockade has become porous over the last two years, with many Turkish consumer goods finding their way to Armenia through Georgia, the economic cost of the blockade remains high. Quantities traded are small and the most rapid and cost effective transport route to Western Europe, North America, and Asia is de facto closed (the major East - West highway of Northern Turkey passes only 50 miles West of Yerevan). Open borders with Turkey would enable goods to be shipped by truck directly from Armenia to the Mediterranean port

of Mersin, which can accommodate ocean-going vessels. It has been estimated that the cost of shipment from Armenia to Western Europe and North America would decline by approximately 50 to 65 percent if freight could be trucked to Mersin. Even more importantly, it would provide a reliable and rapid access to the sea and to modern port facilities. The current route through Georgia with transshipment in Poti/Batumi (and then again at a Black Sea port for rail cargo) is not considered reliable, with lengthy delays, losses of merchandise and theft a frequent occurrence. Although difficult to quantify, the blockade continues to have a confidence-dampening effect on potential foreign investment that is needed to increase exports and generate growth. Also, resumption of some traditional Armenian exports, such as metallurgical and chemical products and building materials, is impossible without a lifting of the blockade.

3.5 Civil conflicts in Georgia have restricted the choice of transport routes, especially by rail, with the Abkhazian railroad closed for the last five years. Although the capacity of that railroad is limited, it would provide a much needed access to the Russian and Eastern European rail networks and avoid costly transshipments. The major road in Georgia crossing the Caucasus mountains has remained open throughout the civil conflicts despite proximity with South Ossetia and has become the most important transport route to Russia and Ukraine.

3.6 **Integrated Regional Transport System.** The railway and road networks in the Caucasus region were developed as integrated networks, independently of republican borders. For instance, the major railway line from Armenia to the rest of the FSU, or the main highway from Yerevan to Tbilisi and Russia, pass through Azerbaijan and have been closed for the last five years. Rehabilitation and investment of transport infrastructure in Armenia must therefore be coordinated with parallel programs in neighboring FSU countries. Overall, the existing Caucasus regional transport network could meet the transport needs of the region, assuming that the necessary investments are made to rehabilitate and then maintain the system. Such a strategy would assume that in the medium- to long-term political stability is restored in the region. In the short-term, priority investment projects that would alleviate the current transport bottlenecks are the upgrading of the Ghumri-Batumi road in Georgia, the completion of the Dilijan tunnel, which would save up to 45 minutes for cars/trucks on the Yerevan-Tbilisi route, and the road to Iran.

3.7 **Underdeveloped Transport Networks with Non-FSU.** Whereas the transport infrastructure was comparatively well developed within the Caucasus region under the Soviet Union, road and rail connections with Turkey and Iran were underdeveloped with traffic volumes only a fraction of intra-Caucasus traffic. There is one rail connection with Turkey linking Ghumri with Kars and requiring a change of gauge at the border in Ahurian. The capacity of the terminal in Ahurian is about 150 wagons/day. Armenian and Iranian railways are not directly connected, the existing line going through Nakhichevan. Even before the blockade, traffic levels on that line were very low. The only direct road connection between Armenia and Iran is at Meghri and implies a long journey through mountainous terrain within Armenia, whereas the optimal, much shorter route passes through Nakhichevan. Road links with Turkey were also underdeveloped with the three main roads built for low traffic levels. However, investment requirements to upgrade the main

roads to Turkey (Yerevan-Karakala) and Iran (through Nakhichevan) would not be high as these road sections are not long.

3.8 **Openness of Neighboring Countries.** Armenia's position as a transit country and trade partner depends to a large extent on the transport and trade policies of its neighboring countries. Armenia's geographic location can only be considered favorable if neighboring countries adopt free trade policies or at the very least promote free movement of goods within their territory. Among Armenia's neighboring countries only Georgia can be considered as having open trade and transport policies with Armenia. Growing trade relations with Iran are very much unbalanced in Iran's favor, with tonnage of imports from Iran being about three times the export tonnage. Iran's trade policy remains heavily protectionist with high import tariffs on consumer goods such as shoes and garments that are produced for export in Armenia. Also, transport of goods through Iran is restricted and subject to administrative controls (choice of routes, transit fees). Unless Iran were to open substantially its economy, it is unlikely that transit through and export to Iran could contribute more than marginally to economic growth in Armenia.

3.9 In summary, Armenia's transport demand will remain heavily dependent on the regional transport situation, both in terms of access to neighboring countries and the condition of transport infrastructure and services in these countries. Therefore, alleviating transport constraints with and in neighboring countries is a necessary condition for achieving the maximum impact from transport sector reform within Armenia.

### **B. The Transport Sector in a Changing Economic Situation**

3.10 In the transition from a planned to a market economy, the transformations that take place in the transport sector are substantial. These respond to the changing role of the State, the opening of the economy, and further recovery of economic activity. The future transport sector services in Armenia would be best able to meet the economy needs through the privatization of all transport services, while public provision of infrastructure such as roads, airports, and navigation aids for air transport would take place on the basis of full cost recovery.

3.11 The number of operators, clients and more generally, decision makers in the transport sector would increase substantially. Initially, beneficiaries of the opening and expansion of the sector would be transport users, operators and specialized commerce and financial intermediators. Of these, the operators may call for control of further entry to protect their initial market shares. As markets expand, new entrants join in the belief that they can beat the current cost structures. If successful, the new entrants may lure away customers from first generation operators. This process of active competition between operators is what leads to lower costs and improved services. The defense of the openness of markets becomes one of the main new functions of the State in a restructured economy.

3.12 A freer transport sector would actually nurture and encourage entrepreneurial activity in other sectors. Small enterprises would be launched, and significant amounts of labor absorbed. The performance of the sector will be closely tied to the recovery of the overall economy. The main areas of expansion and growth, stimulated by export-led economic growth and the continued availability of imported energy, would be trucking and bus transport, freight forwarding, regional aviation and to a lesser extent railways. Furthermore, under competitive conditions, merchandise trade will be stimulated by cost reductions in these services, i.e., containerization, inter-modal transport and freight forwarding, and insurance and management of door to door transport.

3.13 Recurrent maintenance and rehabilitation of publicly owned infrastructure, as the beneficiary of the application of cost recovery flows, would not be dependent on the central Government budget, and would become the basis for a new market for a privatized civil works contracting industry.

3.14 The successful commercial operation of the sector calls for a financial framework suitable to mobilize resources and sustain operations in a market economy. The allocation of private investment resources would take place within this framework. The allocation of public investments, being a part of public expenditure, would require different mechanisms.

3.15 **Financial Framework.** An acceptable financial framework for the transport sector would be an essential factor in achieving the goal of privatized services and a net current revenue position for the sector as a whole. The transport sector would then be able to expand in concert with the economy, and would cease being a drain of scarce public resources. Key aspects of this acceptable financial framework, some of which are already in place, are the following:

I. General Aspects (already in place)

- a) Realistic valuation and periodic adjustments of the foreign exchange rate (the exchange rate is already allowed to float);
- b) Reduction and uniformity of custom duties (low and uniform duties are in place);
- c) Elimination of foreign exchange controls and freedom to buy (and sell) foreign exchange from the banking system at the prevailing commercial rate (current account transactions are already fully convertible);
- d) Liberalization of commercial banking (adequate licensing and supervision exist); and
- e) Managerial freedom to purchase necessary equipment, software and technical assistance, subject only to the financial constraints of a market economy (in place);

II. Transport Specific Aspects (still to be accomplished)

- a) Elimination of State subsidies;
- b) Freedom to set levels of service, and select routes and frequencies of service;
- c) Liberalization of prices;
- d) Unrestricted entry for private investors into the transport markets; and
- e) Recovery of the cost of public infrastructure.

3.16           **Allocation Mechanisms – Private Investments.** For private investments, market forces, prices, costs and access to commercial credit will influence the flow of resources to the transport sub-sectors of Armenia. Global “allocation” of private investment would follow the pace of de-regulation, liberalization and privatization of the economy. *The stronger the pace of change, the stronger the response from the private sector.* In the end, there is little for policy makers to do to assign private sector flows because the price system itself, once liberalized, becomes the allocation mechanism. Each private activity in the sector will have a return resulting from the difference between the cost of production and the prices charged for the output. If prices are not fixed and there is no interference with what can be produced or who can produce it, the supply of goods and services will tend to grow and attract investment until all unsatisfied demand has been met.

3.17           **Allocation Mechanisms – Public Investments.** The case of direct Government expenditure or public debt guarantees is different. A choice among sectors is required first, followed by an allocation to possible uses within that sector. This requires a thorough evaluation of all possible uses of these resources against their benefits. It is necessary to determine social and economic returns for each option, followed by a descending ranking according to the contribution of each to development. The cut-off rate (i.e., the rate of return below which projects will become ineligible for Government support), will be given by the level of resources available. Only projects showing a return in excess of the cut-off rate of return would become candidates for direct Government investment or debt guarantees. Under such allocation systems there cannot exist pre-allocation of resources, which is adverse to economic development or economically inefficient.

### C. Growth Scenarios

3.18           As described in the sections above, transport patterns in Armenia have been and will remain altered by two major factors: the level of economic activity (influenced by the pace of reform), and geopolitical relationships. Based on the possible evolution of these factors, three differentiated scenarios have been developed: (i) a prolonged *status-quo* scenario; (ii) a *border-opening* scenario; and (iii) a *peace in Transcaucasia* scenario.

3.19           **Status-quo scenario.** This scenario assumes the current economic and geopolitical situation in Armenia remains unchanged in the medium term (5-7 years). Borders with Turkey and Azerbaijan remain closed. Trade with Iran remains selective at best, given the geographical situation of Iran and current trade restrictions it imposes. Most of trade and international transport activities would then take place between Armenia and Georgia, as is the case today. The Yerevan-Bavra-Khashuri-Poti-Batumi (Georgia) or Yerevan-Vanadzor-Bolnisi-Tbilisi (Georgia) roads would remain the primary road transport links to and from Armenia. On the economic side, the current pace of reform in Armenia's transport sector would remain relatively unhurried (a partial consequence of a prolonged blockade). Economic recovery prospects, as measured by GDP growth, would be modest (less than 4 percent/year). Most transport sector entities, which already

suffer from current lack of institutional reform, privatization or financial restructuring, would see their asset base progressively erode. Slow changes in traffic demand in all modes would occur. Only timid growth in the limited number of private sector trucking and bus companies would take place.

3.20 **Border-opening scenario.** This scenario assumes that normal relations with Turkey are reestablished and that the border between Turkey and Armenia is opened without any kind of restriction. Recent developments both in Armenia and in Turkey indicate that a termination of the current transportation blockade between the two countries could occur in early 1997. On the economic side, the targets of the reform programs supported by the IMF and the World Bank SAC under preparation, already approved by the Government of Armenia, would be fulfilled. Current reform programs would be accelerated, Government consumption and ownership reduced and investment levels would further increase as privatization takes hold. GDP growth, as projected in the SAC, would then reach between 6 and 7 percent annually (see Chapter II and Table II.2 for details on the SAC reform program and growth prospects).

3.21 Under the program of reform supported by the IMF and the World Bank, privatization, institutional reforms and financial restructuring within the transport sector would be accelerated. Attempts to continue with old structures under the guise of privatization by means of joint stock companies operating in markets with restricted entry and protected from foreign and domestic competition would no longer be possible. Transport enterprises would undergo a restructuring process and reach sustainable operations in an open, competitive transport sector. Public services not privatized would operate under cost recovery policies and in a competitive environment. As a result, unneeded investments and excess transport costs would be drastically scaled back, and expansion of sector output with consistent productivity gains would take place. Under this scenario, transport traffic would progressively increase in practically all modes, to reach GDP growth levels in the medium term. Growth in private road transport would be even sharper.

3.22 *The border-opening scenario will be used throughout the report as the most likely scenario.* Figures III.1, III.2, III.3, III.4 and Tables III.1 and III.2 provide details about historic and projected transport demand and related assumptions used under this scenario. The effects of restructuring have been shown by contrasting global results for the *border-opening* and *peace in Transcaucasia* scenarios against the *status-quo* scenario.

3.23 **Peace in Transcaucasia scenario.** This scenario assumes that over a relatively short period of time (2-3 years), all regional tensions substantially ease. All economic blockades would be lifted and trade and transportation routes with both Turkey and Azerbaijan opened<sup>5</sup>. In this optimistic scenario, Armenia would benefit from a substantial "peace dividend" that would stimulate growth, attract foreign investment as confidence is reestablished, and considerably increase trade volumes as the number of trade partners increases. Armenia could also start playing an important role as a transit country in an East-West corridor linking Europe to Asia and the

---

<sup>5</sup> This would also positively affect trade with Iran.

Middle-East. Under this scenario, we also assume that economic reforms as planned under the IMF and World Bank programs take place. GDP growth would then be even sharper than projected in the border-opening scenario, reaching 7 to 9 percent annually, once all blockades are effectively lifted. The transport sector would largely benefit from this situation, and substantial traffic growth, in line with economic recovery, could take place in all modes. Again, private road transport flows would increase more than in any other transport mode.

#### D. Historic and Projected Traffic

3.24 Armenian statistics only gather transport statistics on a regular and reliable basis from State-owned transport entities. They also include, however, some information about private and non-registered transport. Because of its nature, this information is less reliable and should be regarded only as estimates of orders of magnitude.

3.25 The comparison of public and private historical data shows that the alteration of transport patterns after Independence has had a greater impact on public transport than on private and non-registered transport. The relative importance of private transport in total transport flows has been steadily increasing since Independence. In 1995, estimates indicate that more than 75 percent of total transported tonnage was hauled by private or non-registered entities, while this share was only 55 percent in 1990. Private and non-registered passenger flows also amounted to about 75 percent of total passenger traffic in 1995, up from about 65 percent in 1990.

3.26 The following tables and graphs describe both public and private traffic in an aggregated and non-aggregated form. Unless otherwise indicated, the following text paragraphs will only refer to public transport information. All projections relate to the border-opening scenario.

3.27 **Freight.** Between 1990 and 1995 total tonnage transported has decreased by more than 90 percent, although 1994 and 1995 traffic data indicates this decrease has substantially slowed down. Road transport's total share of freight transport has remained above 50 percent, although the problematic availability of fuel right after Independence largely contributed to increase the railways' share (the Armenian railways run on electric power). Air transport's share has not been significant throughout the period, although the economic blockade gave more importance to this sub-sector in 1993-1994. Historically, the railways' share has been dominated by international traffic and by four groups of commodities within it: agricultural products, petroleum products, mining products and construction materials. Railways traffic is vulnerable to competition from a liberalized road transport industry. Total ton.km traffic followed a similar evolution.

3.28 **Passengers.** Total number of passengers transported in 1995 was at about 32 percent of 1990 levels, or 171 million. When taking into account estimated private sector traffic, 1995 volumes were at 54 percent of 1990 levels. The dominant mode has been road transport with a share of 77 percent in 1990, but only 50 percent in 1995 due to lack of fuel, fuel price increases,

and worsening of cost recovery in the railways. Non-electric urban and suburban transport has decreased partly because of the reduction in the number of available vehicles and insufficient cost recovery. Electric urban transport, like the railways, have indirectly benefited from fuel availability difficulties in other sub-sectors. Similar trends are observed in passenger.km traffic.

3.29           **Forecasts.** Total private and public traffic growth from 1996 to 2003 is expected to approach 20 percent over the period. This in turn represents slightly more than half of the traffic recorded in 1990. Total public and private tonnage transported would reach about 34 million tons. The railways' share of this traffic is expected to drop to 5 percent as competition from road transport and a decrease in humanitarian aid cargo (transported by rail) is observed. Total public and private passenger traffic would grow about 20 percent to 960 million passengers. Road transport's share would be more than 90 percent, while railway passenger transport would be eliminated by 1998 (see Chapter VI). Air passenger transport would retain a residual share.

---

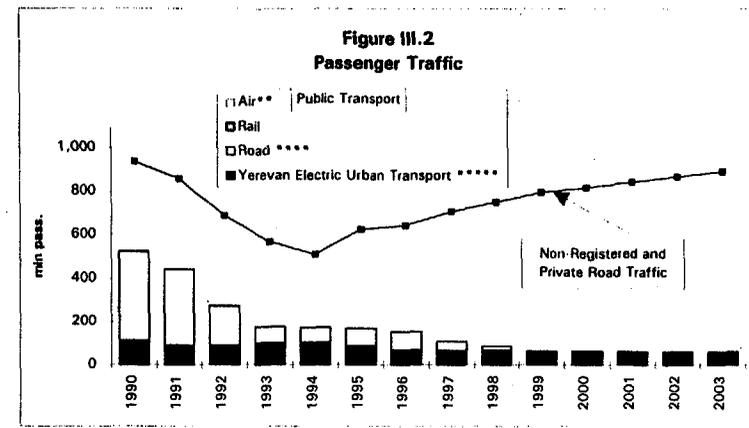
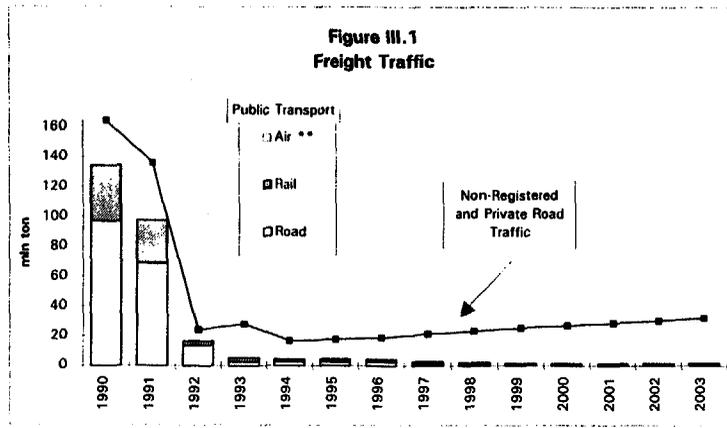


Table III.1

**TRANSPORT SECTOR**

**FREIGHT and PASSENGER TRAFFIC**

(Actual 1989-1995 and Projected 1995-2003)

Sources:

Armenian State Administration for Statistics, Ministry of Economy, Ministry of Transport, Energy Research Institute-TACIS; all sub-setoral entities and mission estimates.

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>FREIGHT (mln ton)</b>														
Public Freight Transport *														
Rail	37.6	29.1	3.0	2.7	2.0	2.2	1.7	1.7	1.8	1.8	1.8	1.8	1.9	1.9
Road	96.9	68.9	13.8	2.7	2.6	2.5	2.6	1.3	0.7	--	--	--	--	--
Air **	0.018	0.017	0.021	0.059	0.034	0.020	0.010	0.010	0.010	0.010	0.011	0.011	0.012	0.012
<b>TOTAL, Public Freight Transport</b>	<b>134.6</b>	<b>98.0</b>	<b>16.8</b>	<b>5.4</b>	<b>4.6</b>	<b>4.7</b>	<b>4.4</b>	<b>3.1</b>	<b>2.4</b>	<b>1.8</b>	<b>1.8</b>	<b>1.9</b>	<b>1.9</b>	<b>1.9</b>
Non-Registered & Private Road Trspt ***	164.6	136.0	24.3	28.0	17.0	17.8	18.9	21.5	23.5	25.6	27.2	28.8	30.5	32.4
<b>TOTAL, Freight Transport</b>	<b>299.1</b>	<b>234.1</b>	<b>41.2</b>	<b>33.4</b>	<b>21.6</b>	<b>22.6</b>	<b>23.3</b>	<b>24.6</b>	<b>26.0</b>	<b>27.4</b>	<b>29.0</b>	<b>30.7</b>	<b>32.4</b>	<b>34.3</b>
<b>PASSENGER (mln passengers)</b>														
Public Passenger Transport *														
Rail	3.5	2.8	2.9	2.9	3.5	3.0	1.7	0.9	--	--	--	--	--	--
Road ****	407.2	350.2	182.0	73.2	66.7	81.7	84.1	42.1	21.0	--	--	--	--	--
Yerevan Electric Urban Transport *****	113.8	91.2	88.9	102.0	104.6	85.8	69.0	66.6	65.7	64.8	64.0	63.3	62.6	62.0
Air**	1.84	1.49	0.85	0.83	0.60	0.55	0.59	0.61	0.63	0.64	0.67	0.70	0.72	0.75
<b>TOTAL, Public Passenger Transport</b>	<b>526.4</b>	<b>445.7</b>	<b>274.7</b>	<b>178.9</b>	<b>175.4</b>	<b>171.0</b>	<b>155.4</b>	<b>110.1</b>	<b>87.3</b>	<b>65.4</b>	<b>64.7</b>	<b>64.0</b>	<b>63.3</b>	<b>62.7</b>
Non-Registered & Private Road Trspt ***	936.1	858.5	689.3	568.5	510.1	624.8	643.5	707.4	750.9	795.1	819.0	843.6	868.9	894.9
<b>TOTAL, Passenger Transport</b>	<b>1,462.5</b>	<b>1,304.2</b>	<b>964.0</b>	<b>747.4</b>	<b>685.5</b>	<b>795.8</b>	<b>798.9</b>	<b>817.5</b>	<b>838.3</b>	<b>860.6</b>	<b>883.7</b>	<b>907.5</b>	<b>932.2</b>	<b>957.7</b>

Notes:

\* data from officially registered State-owned entities under the Ministry of Transport

\*\* departing traffic, all airports

\*\*\* estimated data only, including non-registered and private traffic

\*\*\*\* includes international, interurban, suburban and urban bus, microbus and taxi transport; after 1996, this traffic would become private as road trspt. is privatized

\*\*\*\*\* subway, tramway and trolleybus traffic data for the city of Yerevan

Figure III.3  
Ton.km Traffic

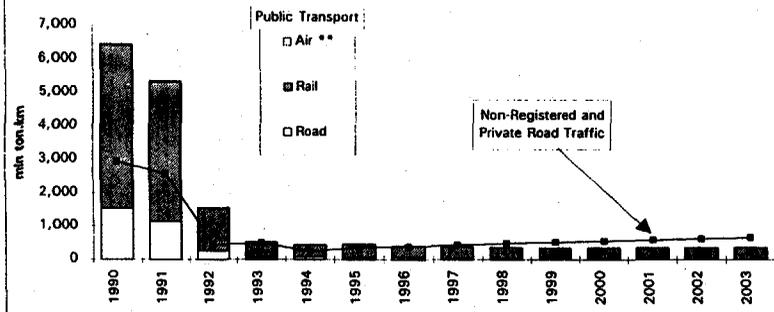


Figure III.4  
Passenger.km Traffic

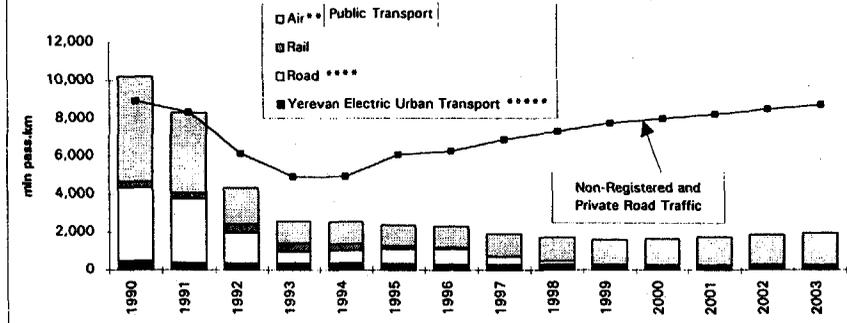


Table III.2

**TRANSPORT SECTOR**  
**FREIGHT and PASSENGER TURNOVER**  
(Actual 1989-1995 and Projected 1995-2003)

Sources:

Armenian State Administration for Statistics, Ministry of Economy, Ministry of Transport, Energy Research Institute-TACIS; all sub-sectoral entities and mission estimates.

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>FREIGHT (mln ton.km)</b>														
<b>Public Freight Transport *</b>														
Rail	4,883.5	4,177.0	1,280.1	450.9	377.6	402.9	345.0	348.5	343.1	346.6	353.5	351.3	358.3	365.5
Road ****	1,533.0	1,139.8	264.3	67.6	73.1	59.9	62.9	31.5	15.7	--	--	--	--	--
Air **	49.0	40.0	20.0	15.0	12.0	10.1	14.4	9.8	12.5	15.4	16.0	16.8	17.7	18.6
<b>TOTAL, Public Freight Transport</b>	<b>6,465.5</b>	<b>5,356.8</b>	<b>1,564.4</b>	<b>533.5</b>	<b>462.7</b>	<b>473.0</b>	<b>422.4</b>	<b>389.7</b>	<b>371.4</b>	<b>362.0</b>	<b>369.5</b>	<b>368.2</b>	<b>376.0</b>	<b>384.1</b>
Non-Registered & Private Road Trspnt ***	2,944.0	2,573.2	448.7	504.4	248.9	359.3	380.8	438.9	482.9	528.5	560.2	593.9	629.5	667.3
<b>TOTAL, Freight Transport</b>	<b>9,409.5</b>	<b>7,930.0</b>	<b>2,013.1</b>	<b>1,037.9</b>	<b>711.6</b>	<b>832.2</b>	<b>803.2</b>	<b>828.6</b>	<b>854.2</b>	<b>890.5</b>	<b>929.8</b>	<b>962.0</b>	<b>1,005.5</b>	<b>1,051.3</b>
<b>PASSENGER (mln pass.km)</b>														
<b>Public Passenger Transport *</b>														
Rail	315.5	319.8	446.0	435.2	353.1	165.0	95.3	47.6	--	--	--	--	--	--
Road ****	3,884.0	3,398.0	1,624.0	635.0	647.0	796.6	820.5	410.3	205.1	--	--	--	--	--
Yerevan Electric Urban Transport *****	463.0	362.5	350.3	348.4	372.0	313.9	281.9	271.9	267.5	263.4	259.6	256.0	252.7	249.6
Air **	5,557.00	4,229.00	1,924.00	1,181.00	1,185.00	1,096.90	1,127.90	1,190.78	1,257.16	1,327.25	1,414.85	1,508.23	1,607.77	1,713.89
<b>TOTAL, Public Passenger Transport</b>	<b>10,219.5</b>	<b>8,309.3</b>	<b>4,344.3</b>	<b>2,599.6</b>	<b>2,557.1</b>	<b>2,372.4</b>	<b>2,325.6</b>	<b>1,920.6</b>	<b>1,729.8</b>	<b>1,590.6</b>	<b>1,674.4</b>	<b>1,764.2</b>	<b>1,860.5</b>	<b>1,963.5</b>
Non-Registered & Private Road Trspnt ***	8,928.3	8,331.0	6,150.7	4,935.3	4,950.0	6,094.6	6,277.4	6,900.6	7,325.1	7,756.1	7,988.8	8,228.4	8,475.3	8,729.6
<b>TOTAL, Passenger Transport</b>	<b>19,147.8</b>	<b>16,640.3</b>	<b>10,495.0</b>	<b>7,534.9</b>	<b>7,507.1</b>	<b>8,467.0</b>	<b>8,603.0</b>	<b>8,821.2</b>	<b>9,054.9</b>	<b>9,346.7</b>	<b>9,663.2</b>	<b>9,992.7</b>	<b>10,335.7</b>	<b>10,693.1</b>

Notes:

\* data from officially registered State-owned entities under the Ministry of Transport

\*\* departing traffic, all airports

\*\*\* estimated data only, including non-registered and private traffic

\*\*\*\* includes international, interurban, suburban and urban bus, microbus and taxi transport; after 1996, this traffic would become private as road trspnt. is privatized

\*\*\*\*\* subway, tramway and trolleybus traffic data for the city of Yerevan

## IV. TRANSPORT AND TRADE FACILITATION

### A. Overview

4.1 The present chapter reviews physical and institutional barriers to trade and transport on main transport modes as these barriers are seen from Armenia and its trading partners. It also presents estimated excess costs incurred by international shippers because of such barriers. These estimates are based on international comparisons and on interviews with Government officials and with transport operators. Tentative cost estimates of corrective measures are also suggested, although pre-feasibility studies would be required to refine them. Corrective measures are presented along with each major barrier.

4.2 Armenia's foreign trade has traditionally been substantial and in fact, critical to the country's economy (see Chapter II). In recent years, the movement of goods into and out of the country was severely restricted by political and social unrest in the whole Transcaucasia region. Despite economic problems related to the blockade, an evolution towards restructuring and privatization of small and medium-scale enterprises in the transport sector has been observed. This evolution, however, has been slow, and the privatization of medium and large-scale industrial units is still distorted by the technical ministries, who routinely form holding companies that operate according to command economy rules.

4.3 In the future, it is expected that Armenia's foreign trade will increase as political border difficulties are resolved, and particularly as the border with Turkey opens. This development should be further facilitated by the progressive elimination of excess costs traceable to trade and transport distortions. Such unnecessary costs could slow down the revival of the country's commerce by acting as self-imposed trade barriers and by compounding the effect of tariffs and quotas that the country already faces in its markets. Excess costs also defeat the purpose of tariff reductions that may be consented to by Armenia's trade partners, particularly by OECD (Organization for Economic Cooperation and Development) and WTO (World Trade Organization) countries. These distortions and their associated costs affect the balance of payments, the availability of convertible currency, and restrict entry into foreign markets.

4.4 While the geographic dimensions of Armenia are small, the barriers and restrictive practices prevailing in the country affecting transport and trade are significant. Such barriers are still in place today, although the country has stabilized its monetary system and progressed in harmonizing its customs system to European standards. Indeed, for 1995, the total value of goods traded (imports plus exports) was about US\$944 million, while the cost of associated services (total non-factor services debits and credits) amounted to US\$157 million, or about 17 percent of the overall trade transactions, a percentage that is 7 percent higher than the 10 percent international average. In other words, excess costs associated with trade and transport transactions can be estimated at around US\$65 million in 1995, representing one-seventh of the same year's overall Balance of Payments deficit, which amounted to US\$477 million.

4.5 A separate study identifying and evaluating actual excess costs leads to similar estimates: direct excess-costs of all trade and transport barriers identified amount to about US\$67 million (see Table IV.1 below), or 7 percent of total trade (exports + imports). The cost of removing these barriers is estimated at US\$ 8.15 million. Some of the excess costs relate to trade control barriers. Their removal depends on trade liberalization measures under consideration and on the political situation in the region, a situation which does not depend only on the Armenian Government. *The difference (US\$50 million), however, could be offset by implementing a subset of corrective actions estimated at only US\$5.7 million.*

4.6 These estimates could be considered as a floor to excess costs. An analysis based on freight factors (see para. 2.32) indicates that excess costs would amount to about US\$100 million. *These totals do not include trade and welfare gains from expanded trade (see Section C).*

**Table IV.1** Recapitulation of Trade And Transport Related Excess-Costs

<b>Barriers</b>	<b>Estimated Excess-Costs (US\$ mln per year)</b>	<b>Cost of Corrective Measures (US\$ mln)</b>
Conventions and Documentation	3.50	0.20
Insurance and banking	19.25	1.80
Customs and border impediments	14.00	4.15
Road Transport	2.30	0.50
Rail Transport	20.00	1.50
Multimodal Transport	7.70	0.50
<b>Total</b>	<b>66.75</b>	<b>8.15</b>

The corrective measures presented in Table IV.1 would generate a Net Present Value of more than US\$150 million over a period of five years on excess costs alone.

### **B. Excess Costs and Corrective Actions by Physical Source**

4.7 The presentation is organized according to the origin of the excess costs:

- a. Conventions and documentation
- b. Insurance and banking
- c. Customs procedures
- d. Road Transport
- e. Rail Transport
- f. Multimodal Transport (limited to freight forwarding aspects<sup>6</sup>)

<sup>6</sup> See Annex I for multimodal transport and containerization issues in Armenia.

4.8 **Transport Legislation and International Conventions.** The development of Armenia's international exchanges is hampered by:

- lack of a proper trade-enabling system: modern equipment and infrastructure, and access to resources to finance replacement of obsolete elements in the system;
- prevalence of political conflicts throughout the region, resulting in blockades enforced by Azerbaijan and Turkey, which cut Armenia's traditional routes to Russia and to Western Europe;
- delays in privatization activities aimed at establishing a self-sustained transport sector capable of operating internationally;
- insufficient understanding and command of international trade and transport business practices and relations; and
- rent seeking practices.

4.9 Thus, except for a few subsidiaries of foreign companies or local companies having strong foreign ties, Armenian shippers make do with most traditional legal instruments for commercial transactions, seldom using documentary credit or International Contract Terms (Incoterms). Uniform domestic transport documents are generally used, and sometimes documents having legal tender under international conventions that Armenia has not joined are "borrowed". Such is the case with the Geneva Convention (CMR) carrier bill and the International Road Transport (TIR) carnet for international haulage. Finally, concerning customs clearance, merchandise declaration is generally consistent with the Single Administrative Document (SAD) used throughout Europe.

4.10 Domestic legislation regulating relationships inherent to transport contracts is lacking, and international transport conventions have not been adhered to. Yet, as mentioned above, international convention documents are "borrowed", and constitute some kind of informal contract between the parties, if not a document that is binding under international law. Shipping documents consistent with the Liner Bill of Lading drafted by the Baltic and International Maritime Council are used, along with bills of lading developed by the Soviet Maritime Law Association, which provides enforcement of the Convention signed in Brussels on August 25, 1924, and with the USSR's shipping code (which is adhered to). Therefore, in the current state of affairs, present practices do protect shippers against complete legal uncertainty, but do not eliminate risk altogether.

4.11 Indeed, adequate protection requires transport documents to derive from International Conventions, Incoterms rules to be applied within each contract, and documentary credit to be used routinely. Otherwise, there is no assurance that the shipper will be compensated for the damage inflicted to the goods by the carrier, as parties will only be able to settle disputes "out of Court".

4.12 At present, the **Railways** use transport documents that are those of the Former Soviet Union. The USSR did not join the Bern Convention of May 9, 1980 (also referred to as COTIF) and used its own rail waybill (SMGS), which is different from the European one. For

**Road Transport**, most of the fleet is owned by the State through "transport utilities". A shipper must submit an application to the Merchandise Haulage Division of the Department of Transportation, which assigns the transaction to one of its utilities. The transport documents are those used in the former Soviet Union, which joined in 1983 the Geneva Convention signed on May 19, 1956 (CMR). In addition to the old pre-1983 CMR waybills, a certificate is issued that entitles the driver to carry out the transportation activity, and written agreements are drawn between the Ministry of Transport and the shippers. The carrier is responsible for delivering the goods in good condition, except in case of an armed attack. In case of breach of contract, indemnity amounts to three times the value of the goods. The shipper is responsible for loading and unloading the shipment and supplies the required fuel.

4.13 The "**Road carriage statute**", a Soviet regulation supplemented by bilateral agreements, which adjust old provisions to a relatively new context, is still in force in Armenia. The rationale is based on the fact that the Soviet Union has indeed in the past ratified some of the international conventions, and has once undertaken to harmonize its domestic law with international standards. Besides, Armenia has bilateral agreements with Russia, Belarus, Moldova, Ukraine and Iran. At present the country is in the process of setting up the TIR system. The national guaranteeing Association representing road carriers is established, but has not started its operations according to the TIR procedures. Training of TIR officers to use the software and hardware of the Association must take place, along with the promotion of the system in the country. The Association must design its own software and organize a TIR workshop in the country, involving participants from the Customs authorities, the Ministry of Transportation, and the carriers.

4.14 Armenia's experience with the implementation of the TIR system --the only Convention that the country has started to adhere to--, illustrates the cost and difficulties that the country will encounter with all other Conventions that should be adhered to by a landlocked country in order to facilitate trade and transport. These conventions include several types of transit treaties, railway border crossing agreements, road traffic and road signs conventions, customs conventions on the temporary importation of commercial vehicles, on containers, on the harmonization of frontier controls of goods, on the international multimodal transport of goods and on the international carriage of goods by road (CMR), in addition to the TIR convention. More detail is given on these conventions in Annex 1, devoted to multimodal transportation and containerization issues. Suffice it to indicate here that the highly centralized state controlled structure prevailing in the country during the Soviet regime did not foster professional associations on which these Conventions are based.

4.15 Given its extreme shortage of financial resources, Armenia's participation in International Conventions must be planned with the utmost parsimony, after establishing that the quantitative advantages of such participation unequivocally outweighs its initial and recurring costs. In these conditions, it is necessary that the professional organizations --usually private-- that must be created in connection with each Convention, be operated as businesses. It must be cost-effective for users to join. The organization must break even. Clear benefits should accrue to national trade and transport activities.

4.16 It is recommended that an independent study be conducted for a number of Conventions of potential interest to Armenia. This study will identify prospective members, develop marketing and business plans, and conduct cash-flow and cost-benefit analyses. It will determine the relative usefulness, urgency and viability of each of these Conventions. It will rank their priorities and establish realistic time-tables for their acceptance.

4.17 **Direct Costs Resulting from These Barriers.** Excess costs under this category are related to the inadequacy of documentation procedures. They include unrecovered losses, additional costs, delays, and occasionally special (unrecorded) payments, and apply to all modes and products, except for imports of gas. *They are estimated at US\$3.5 million or about 0.5 percent ad-valorem.*

4.18 **Costs Associated With Corrective Actions.** *A total of US\$0.2 million, whether spent by the Government of Armenia or obtained as a grant, would provide the technical assistance necessary to determine the conventions that must be adhered to, considering that benefit-cost analysis should show that the cost of establishing a convention's requirements would be repaid through membership advantages.*

4.19 **Insurance.** Insurance concepts have recently been introduced in the system, but are not fully legislated, and are not yet widely ingrained within business practice. Private cars are not insured. Trucks are not insured either, unless they are leased abroad. Local trucking companies are not able to get insurance abroad. Foreign insurance companies are technically allowed to operate in Armenia, but are not yet active, due to lack of legislation in the matter, and because of high, uninsurable risks, as well as absence of reinsurance. International insurance is not available, as the country is classified as a war zone.

4.20 The Ministry of Transport considers the lack of a suitable insurance system as a fundamental deficiency, precluding proper international haulage, except for humanitarian aid. Armenia does not have an insurance law and did not share in the split of the federal Soviet insurance institution "Gosstrach". The shipments from Europe to Armenia seek coverage from companies that can provide a tailor-made policy upon request. Due to the legal vacuum in this field, practically no Western insurance company is willing to operate in the former Soviet Union, where theft exposure is extremely high. The reason for the absence of even an embryo insurance system in Armenia dates back to Soviet Union times, when the State was the only economic actor in domestic transport in the centralized economic organization. All profits and losses would always shuttle into the same accounts, which is the antithesis of the insurance concept. Concerning international haulage, goods and vehicles were insured by the Gosstrach which had no branch in Armenia since it had no trade with foreign countries. It is now necessary to create an insurance system as part of the country's transition to sovereignty and a full market economy.

4.21 It is necessary to draft, adopt and implement appropriate legislation and regulation for insurance companies and intermediaries. In doing so, it is important to harmonize Armenian legislation with the standards of the European Union, particularly as far as transportation and freight insurance are concerned. The nature of recent developments in Armenian capital markets,

as they apply to the insurance industry, should be taken into account in the envisaged legislation. These developments include, among other factors, the share of insurance company assets that may be invested in securities, and the valuation rate of the capital market. Consumer protection standards and legislation should also be established in order to avoid situations where actual protection is not provided by the insurer. Armenian administrative appeal procedures should be strengthened and clarified.

4.22            **Banking and Documentation Services.** At present, Armenia's banking sector consists of five public sector banks and more than forty private banks. Foreign banks are represented by branches of Mellat Bank (Iran) and Midland Armenia (UK), both of which opened in 1995. The five major banks are state commercial banks, namely Ardshimbank, Armimpexbank, Armeconombank, Agroardbank, and Khnaybank. The Central Bank of Armenia acts in a coordinating and controlling capacity. State Banks conduct business with utilities, private companies and foreign markets. Private commercial banks are allowed to operate abroad, but actually are short of clients and of technical facilities except for a few of them whose main activity is foreign exchange. Thus, in spite of liberal legislation promoting international transactions, State banks are still crowding out the sector. To open a business account in a local bank, an enterprise must present its registration documents and a completed application with notarized signatures.

4.23            In fact, transactions are simpler between Armenia and the rest of the world than within Armenia and between Armenia and CIS countries where procedures, networks and computer systems are outdated, and for which a clearing system at the Central Bank of the Russian Federation is used for domestic transfers within the CIS. In the long term, the Armenian Government wants to turn Armenia into the financial hub of the region. Today, the financial services market in Armenia remains greatly underused and unexplored due to the still backward and unreliable local banking system, artificially high interest rates on loans (50 to 60 percent), and the limited role of foreign banks.

4.24            It is estimated that almost 60 percent of all transactions in the private sector, including export/import, are made in cash, and up to US\$15 million in cash gets to Armenia every month without entering the banking system. These US\$ 180 million per year are not recorded in the Balance of Payments. Using the services of local banks often becomes a tiring process, and there are cases where international aid organizations are forced to bring cash to fund their activities. At present, USAID is assisting the Armenian banking sector in establishing a modern inter-bank electronic transfer system that will have access to international transfer networks. A few Armenian banks have started to cash traveler checks and to accept credit cards. Boosting trade and foreign investment in the country will require more suitable banking performance. Construction of the high capacity terminal at Yerevan's main airport may turn Armenia into a significant transit point for high value cargoes, which could increase the flow of cash needed to improve the banking system.

4.25            Most Armenian banks presently offer their services for administering payment for foreign trade operations. Methods of payment include advance payment, a letter of credit, and

other internationally accepted forms, except credit cards and checks. Advance payment is the mode of payment of choice for Armenian sellers, including transportation providers. Letters of credit can be opened by the client's bank only by large firms. As is the case elsewhere in the world, restricted access to credit and banking is the source of rent seeking behavior.

4.26 Local commercial banks charge from 5 to 10 times the rate of Western banks for letters of credit and other services. They are not equipped to handle electronic fund transfers, but are linked through a chain of local banks and correspondents, which all charge a commission, resulting in very high and widely applied final costs when compared to modern bank standards.

4.27 **Direct Costs Resulting from the Insurance and Banking Barriers.** *Restricted banking has been estimated in similar FSU countries to increase transaction costs by at least 30 percent, which translates to about 1 percent ad valorem excess cost, for about one third of the non-energy trade (US\$770 million), i.e., about US\$7.7 million annually. Furthermore, the lack of insurance services adds excess costs to trade transactions estimated at 3 percent ad-valorem, applicable to half of the non-energy exchanges, amounting to about another US\$11.55 million.*

4.28 **Costs Associated with Corrective Measures.** *Liberalization of the overall banking sector is a significant element in the Government's reform program and is already otherwise financed. The necessary technical assistance to develop and disseminate the framework specifically required for trade enhancement is estimated at US\$0.8 million, while the program aimed at setting up a viable and competitive insurance sector, solely for trade and transport purposes, would require technical assistance in the amount of US\$1.0 million. The total costs of corrective measures for both sectors is thus estimated at US\$1.8 million.*

4.29 **Customs Procedures.** The Customs Department was created in the Republic of Armenia in 1992 in order to collect resources aimed at redressing a chronic shortfall in revenue necessary to conduct Government activities and to cover expenditures required to protect the country's borders. Previously, the Customs officers in Armenia operated a border service, but had limited experience in undertaking the traditional role and functions of a full-fledged Customs Administration. The country was divided into four regional customs districts, each controlled by a regional customs office responsible for the check-points, which include:

- Iranian border: Meghri
- Georgian border: 6 check points
- Turkish border: 32 check-points

Negotiations are on-going to open check-points with Turkey and Azerbaijan (4 are under consideration). Indications of traffic at customs points are shown in Table 4.1, Statistical Appendix.

4.30 A new Customs code and a law on customs tariffs were enacted. They establish harmonization with foreign systems and are based on American, Turkish, Russian, Iranian and French legislation. The Community of Independent States (CIS) is considered as a foreign

country, but there are waivers within the CIS concerning certain products, and inter-state agreements (transit, cooperation and assistance in border police matters).

4.31 During the time of the establishment of the Customs system, the Department's regional customs houses and customs points did not have their own administrative buildings, warehouse facilities and supplementary buildings, technical devices for customs control, vehicles, telecommunications equipment, or even uniforms. Technical and material resources were lacking as there were no allocations from the Government budget for building such facilities and for procuring such equipment. From 1992 to 1996, funding made available from the budget was only available for salaries.

4.32 At present, numerous customs points operate in temporary shacks, trailers and borrowed buildings that are totally inadequate for the pursuit of this administration's complex and multiple duties. This situation results in substantial losses of revenue to the State and considerable inconvenience to foreign trade and transport operators. The present state of the premises and equipment makes it practically impossible to install computer, fax, telephone and other telecommunication devices in most border locations. Computerized control of operations is therefore excluded, and current conditions impose extremely lengthy manual procedures to examine large volumes of import and export cargo according to required international standards. Sometimes these procedures are altogether foregone, with the associated risks and revenue losses, as in the case of cross border "commuter trade".

4.33 The Customs Department is responsible for the collection of all customs duties and excise on imported goods. It will also be responsible for the collection of value added taxes on imported goods from 1-1-1997. Export duties are not applied in Armenia. Tariffs are in ad-valorem terms and levied on CIF values. The tariff schedule is rated either 0 or 10 percent (Decree No. 105 of 05.10.96). The ten percent tariff is levied on 57 out of the 150 items consisting mainly of consumer goods and luxury items. The value of imports is declared by the exporter. The value declared should be based on reliable, countable, documented sources. In the absence of these, the customs may use its own or comparable information sources and GATT valuation methods. A customs fee of 0.30 percent is collected on both imports and exports, and is used to build up a Customs Department Reserve Fund, to pay staff salaries and to finance social programs for the employees. The latter would amount to a pre-allocation of general revenues.

4.34 During the calendar year 1995, collections amounted to US\$7.65 million for Customs duties, US\$1.42 million for excise duties, and US\$1.03 for customs fees. It is expected that in 1995, the collection of customs duties will exceed US\$9.25 million, while excise duties will exceed US\$8.25 million. In fact, these targets were already achieved in October 1996.

4.35 The Customs Department's Reserve Fund played a basic role in establishing a technical-material foundation for the customs system. From 1993 to 1996, about one billion Drams were spent for this purpose from this Fund. It was thus possible to construct the Margara and the Akhurik customs points, and to start the construction of Meghri custom point.

Furthermore, the refurbishing of the Customs Department apparatus and the reconstruction of Ararat's regional customs house administrative building is in the completion stage, as is the construction of Shirak's regional customs house administrative building.

4.36 Cost increases to transport and trade associated with customs are caused by:

- slow procedures at inland clearance depots due to lengthy customs declaration and documentation preparation, and lack of trained customs inspectors;
- insufficient physical facilities (absence of separate lanes for empty trucks, bonded warehouses, no priority itineraries for transit traffic, no safe parking lots for the night, no hotel accommodations, etc.);
- informal transactions and payments and their effect on freight immobilization;
- unsatisfactory liability provisions for international traffic;
- insufficient number of computer terminals and their absence at inland locations and in certain industrial sites, causing time consuming queues, manual tasks and absence of Electronic Data Interchange (EDI) facilities;
- complex recourse procedures to resolve disagreements regarding interpretation of customs classification rules, valuation methods and local contents requirements;
- difficulty in obtaining title dispensations in simple cases; and
- lack of training of customs officers both in Armenia and in its neighboring countries.

4.37 It is recommended to start in the near future the planned construction and equipment of administrative buildings for the Gurark and the Syunic regional customs houses, as well as the construction and equipment of the custom houses and customs points of Bavra, Bagratashen, Gogovan, Privolnoy and Ayrum. In addition, it is necessary to build and equip customs warehouses in all regional customs points, including the customs houses of Ararat, Shirak, Gugark and Syunic and the customs points of Bavra, Bagratashen, Akhuric and Margara. Finally, it is necessary to build and install 50-60 ton scales in most of the above mentioned locations.

4.38 The recommended equipment for these customs houses and points should make it possible, within reasonable time and according to international standards, to:

- carry out the stamping of imported cargo;
- use monitoring and other technical customs control devices;
- prevent import and export of concealed and smuggled cargo; and
- achieve a higher level of performance in the delivery of various services required by private and institutional parties.

4.39 **Direct Costs Resulting from these Barriers.** Following the upgrade of the above facilities, the total sums collected as customs duties, excise taxes, value added taxes and customs fees would substantially increase, representing a surplus estimated at US\$11 million. Finally, the time and resources saved by shippers would be considerably increased, representing

a saving estimated at 25 percent of current customs revenues. *In other words, the excess cost to the public at large, caused by the inadequate facilities to be replaced, amounts to an estimated US\$14 million.*

**4.40 Costs Associated with Corrective Measures.** *The typical budget for improvements at border crossings may vary from US\$200,000 to US\$1 million per border crossing site. A total cost of corrective measures of US\$4.15 million has been estimated, detailed as follows:*

	US\$ million
Construction of two regional customs houses administrative buildings	1.20
Construction of five customs points administrative buildings	2.25
Construction of 11 customs warehouses	0.55
Installation of scales	0.15
<b>Total</b>	<b>4.15</b>

**4.41 Road Transport.** Because of Armenia's blockade and the military-political situation in the region, trade and road transportation are still subject to significant impediments. Also, the privatization program for the trucking industry is lagging. As a result, efficiency suffers and the dwell time of goods at various points in the transport chain is excessive.

**4.42** Despite its relatively poor quality, the road infrastructure in Armenia allows access to almost the entire country and is generally adequate for modern trucking. However, some road pavements are in a bad state of disrepair, causing considerable traffic slowdowns, particularly at night and during snow conditions (see Chapter V). The current truck fleet of Armenia will suffice for most domestic markets over the short term but is not suitable for trade with Western Europe. Most trucks are of outmoded design, poor quality, fuel-inefficient and costly to operate. In addition, few of the local trucks would meet the emission regulations in Western Europe and this limits their use for international traffic (also see Chapter V). By comparison, modern heavy trucks would lower units costs of road transport significantly. It is also difficult to find in Armenia specialized trucks to ship agricultural products (wine, fruit, processed food, etc.) over long distances. Finally, the lack of international insurance (see paras. 4.19 and following) precludes the leasing of foreign trucks (e.g., Volvo, Mercedes, Daf, etc.), and further hampers the competitiveness of the local trucking industry.

**4.43** An international agreement was recently signed on opening a Burgas (Bulgaria) - Poti (Georgia) - Armenia - Iran cargo transportation corridor. A ferry capable of transporting 40 loaded trucks has already begun operation between Varna and Poti. It is believed that the new corridor will facilitate shipments between Armenia and Europe. The Armenia-Iran border connection is currently via a new bridge. The Iranian port of Bandar-Abbas lies 2,300 km from Yerevan. Once an insignificant port, it has been substantially upgraded since the end of the Iran-Iraq war. A rail link fully integrating the port into the infrastructure of Iran was recently completed. Freight forwarding companies accept 40 foot containers (20 ton maximum weight), but, because of the gradient of the road going north to the Armenian border city of Meghri,

Iranian officials advise using 40 foot containers only between March and October. Work is under way to improve that segment of the road to provide maximum capacity service all year round.

4.44 A separate analysis<sup>7</sup> estimated that, if these problems are resolved and the border with Turkey reopens, shipment costs from Armenia to Western Europe, North America and Asia would decline by 65 percent. Goods would be shipped by truck directly from Armenia to the Mediterranean port of Mersin and loaded directly on ocean-going vessels there. There is a European standard East-West highway in Northern Turkey that could convey shipment of Armenian freight by truck. This solution would eliminate costly and time-consuming transshipment at Poti, Georgia and Bandar-Abbas, Iran (Bandar-Abbas traffic further requiring transshipment to larger ships in Dubai), and further explains the differences in freight factors discussed in para. 4.6.

4.45 **Direct Costs Resulting from These Barriers.** Most of the excess-costs are related to fleet impediments, excluding those resulting from the blockades. *The costs resulting from these barriers have been estimated at 1 percent ad-valorem of the road merchandise, or 30 percent of imports and exports, excluding gas (valued at US\$230 million), for a total of US\$2.3 million.*

4.46 **Costs Associated With Corrective Actions.** *A total of US\$0.5 million, whether spent by the Government of Armenia or obtained as a grant, would provide the technical assistance necessary to remove road transport barriers and stimulate the development of a private road transport industry.*

4.47 **Rail Transport.** Armenian railways are seen as slow, albeit somewhat safer than trucks, by shippers. Still, shipments to the East are sometimes provided with guards on board who deter pilferage outside Armenian borders. As long as the Turkish border is closed, the railways will continue to have a dominant position in FSU trade. Although with substantial excess capacity, the railways lack specialized tank cars for the transport of bulk wines and edible oils as well as refrigerated and air-suspended cars (see Chapter VI for details on the Armenian Railways).

4.48 All types of vehicles, mostly inherited from the former Soviet Union system, have not been renewed in recent years. In addition, transport costs have risen due to energy cost increases. It is increasingly difficult to bring fresh produce to market, whether by truck or by rail. Fresh produce is one of the export resources of Armenia that is in serious jeopardy because of transportation failures.

4.49 Railway border crossings are regulated through special agreements, either bilateral or multilateral. Cooperation agreements regulate all crossings within the CIS. According to these, the railway that delivers a train to the next railway is responsible for the

---

<sup>7</sup> conducted by Mr. Elliott Hurwitz

hand-over of a train in good running condition (all wagons and coaches must be checked for brake operations, and freight loads must be controlled and corrected if necessary).

4.50 The only border crossing now in operation is the Georgia crossing. Because of poor management of the Georgian Railways, the passage is a very slow and difficult process. At present, the daily average crossings are of only one or two freight trains headed north, and about the same number coming south from Georgia. As the Turkish Railway gauge is on the European standard of 1,435 mm, crossing the border with Turkey, which is closed for the time being, requires, either reloading the freight or changing the wagon bogies. The new facilities built at the railway border crossing at Ahurian (close to Ghumri) allow the latter activity. Before construction of the new facility, border crossings with Turkey were limited to approximately 25 wagons per 24 hour, while at present this number can grow to 150 wagons per 24 hour. When the border reopens, a bilateral agreement between the two railways will have to be negotiated to facilitate passage.

4.51 **Direct Costs Resulting from these Barriers.** *The costs resulting from these barriers have been estimated at 4 percent ad-valorem of rail-transported merchandise (valued at US\$500 million), for a total of US\$20 million.*

4.52 **Costs Associated with Corrective Actions.** *The costs of corrective actions have been estimated at US\$1.5 million.* They cover the technical assistance needed to introduce at all border points up-to-date office technology, transfer equipment for multimodal transport, as well as customs and communication equipment items and training of railway managers and staff to improve management performance.

4.53 **Multimodal Transport of Armenia's Traded Goods.** Armenia being a landlocked country, trade requiring ocean shipping is by definition multimodal. The Georgian ports of Poti and Batumi are now used for multimodal transport. Continued use of these ports depends on whether and when the Turkish border will open, making it possible to truck shipments to the port of Mersin with considerable savings compared to the Poti route. More details on the feasibility and efficiency of these alternative routes are found in Chapter III (Transport in the Regional Context, section B), and in Annex 1 (Multimodal Transport and Containerization in Armenia).

4.54 Air transportation (see Chapter VII for details) cannot be considered as a viable link in multimodal transport in the present conditions, and ensuring regular cargo shipments is an unresolved issue. Airports experience shortages of fuel. Armenian Airlines, the main Armenian carrier, does not possess its own cargo planes. "Yerevan-Avia", a carrier founded by the City Council of Yerevan in 1992, owns two IL-76 cargo aircraft. However, these two planes primarily serve Government procurement and international aid programs. The existing gap is partially filled by a few local and foreign charter companies, some of which often charter either "Yerevan Avia" or Russian or Ukrainian cargo planes for the shipment of goods to and from Armenia. Shipping of commercial cargo by the passenger connections via Europe is possible but is of course limited by size and weight constraints. Moreover, on-time delivery cannot be

guaranteed. Under an EBRD loan, a modern terminal is being constructed at Zvartnots Airport to handle international and domestic cargo shipments. The project's completion is planned for 1997, and will enable Armenia to adjust to international standards of handling commercial cargo.

4.55 The development of multimodal (or combined) transport is necessary to ensure growth of trade activities, and it represents a future opportunity for the railroads (see Annex 1). However, the extreme importance of management quality required for this type of service must be addressed and resolved before major investments are made. The purpose of expensive infrastructure improvements is defeated when their benefits are eliminated or undermined by the prevailing:

- absence of freight forwarders or border crossing services;
- outdated commercial and transport documentation; and
- deficient insurance arrangements.

4.56 Multimodal shipments depend heavily on containerization (see Annex 1). Private shippers find it difficult to obtain containers from the railways, even though containers are standing idle. Before being in a position to capture multimodal traffic, the Armenian Railways should first be restructured to adapt to a new but reduced role (see Chapter VI).

4.57 Freight-forwarding is a profession that is aimed at complementing the role of insurance companies in the transport sector. Yet, there are practically no freight forwarders in the country, neither local nor foreign. For the Armenian trader, the logistic problem is to get the goods out to the first available proficient Western freight forwarder, and let him handle the rest (and vice-versa for imports).

4.58 The freight forwarding profession, however, plays a fiduciary and financial role. The freight forwarder is more than a freight broker or a customs broker; it legally acts as the temporary owner of the shipment. If the shipment is damaged or disappears, the freight forwarder must be protected against its client's claims. Conversely the client must be protected against fraudulent losses. These activities are practically impossible in the present context where commercial commitments are very risky, transaction outcomes are uncertain, and partners' solvency is put in question on a daily basis. Special training is required to carry out a freight forwarding operation in this high risk environment, including training in the use of various forms of hedging, routing on alternative and safe --but more costly-- itineraries, and adopting efficient payment channels.

4.59 In practice, the freight forwarder substitutes itself for the importer or exporter for several operations, and thus bears the brunt of the volatility of import-export markets and irregularity of payments. The development of the forwarding industry will be essential for the growth of international trade, in particular in relation with the expected introduction of 20-40 feet ISO-containers and the development of the "door-to-door" transport concept. In the past, all freight and transport arrangements were handled by State-owned organizations who enjoyed a

monopolistic situation. This has now changed, but private sector involvement is very small and the range and level of services low.

4.60 Development and growth of the freight forwarding profession in Armenia is impeded by the somewhat contradictory prerequisites of this profession, which needs to be both liberalized and supervised and licensed to protect the interests of the shippers and owners of the merchandise. An adequate licensing of the freight forwarding profession, however, will not be easy to implement. For example, ideally, freight forwarders should be registered for taxation purposes and to guarantee that goods are insured while they are in their custody. The prevailing license system, however, is based on the number of trucks or geographical zones and cannot be used in this context, as it would clearly be counter-productive. The existing system of geographical monopolies slows down the emergence of an efficient private sector in both freight transport and freight forwarding activities.

4.61 **Direct Costs Resulting from the Freight Forwarding Barrier.** The shortcomings in the multimodal transport chains, ranging from inadequate worldwide freight forwarding services to the unsuitability of local trucks, and restricted and costly port access, significantly complicate the process of multimodal exporting and about double the transport cost of potential exports, according to several entrepreneurs in Armenia. This translates to about 5 percent ad valorem, part of which is already accounted for in the 4 percent covered under road and rail excess costs. Thus, *the specific freight-forwarding component of these excess costs is estimated at 1 percent of the value of the non-energy trade, or about US\$7.7 million.* Yet the main impact of these deficiencies is constituted by foregone trade opportunities and the failure of the transportation system to contribute to the country's economic recovery.

4.62 It is recommended to reform and/or to eliminate the laws and regulations surviving the FSU and remaining in force, and to establish a strong forwarding agency based on open access principles. In addition, there should be a clear demarcation between forwarders acting in an **agent capacity** and those undertaking responsibilities as **principals**, that is enterprises meeting all shippers requirements in a particular transaction and accessible for redress in the event of problems, and shielding the shipper from having to commence legal action against transport operators in other countries at great cost and uncertainty on the ground that the forwarder was just an "agent".

4.63 Forwarding should be self regulated as a profession on a qualitative basis with open entry, provided that several qualitative criteria and standards are met. As it is the practice in Western countries, the qualitative criteria would include:

- meeting solvency requirements;
- adhering to a code of professional conduct;
- personnel fulfilling training and qualification requirements;
- adhering to internationally accepted terms and conditions of trading; and
- fulfilling minimum insurance requirements.

4.64 It is necessary to create the framework for organizing a National Association of Freight Forwarders with regulatory and representational functions, which would become a member and would adhere to the regulations and rules of conduct of the "Federation Internationale des Associations de Transitaires et Assimilés" (FIATA). This is considered as an essential step in helping to organize, structure and discipline the profession.

4.65 Membership in FIATA is recommended as it would give forwarders access to further expertise and make it possible for them to use internationally recognized and trusted documents, including the FIATA consignment note for combined transport (multimodal bill of lading). Forwarders who are permitted to issue such documents enjoy enhanced relationships with various organizations such as banks, shipping lines and/or insurance companies.

4.66 It is recommended to use standardized documents "aligned" to the UN system, permitting their eventual production by computer and EDI processes, as indicated in the above section on documentation related barriers and procedures.

4.67 Reform and organization of the freight forwarding system must be linked to the update of legal procedures regarding contracts and ICC commercial standards for the international sale of goods, documentary practices (discussed above), banking practices (such as the Uniform Customs and Practice for Documentary Credits, UCC 500), and insurance practices (including the London Insurance Market Institute Cargo Clauses A, B, C.)

4.68 In the field of privatization, applied to international truck transport, it is necessary to formulate, better define and implement the liberalization measures needed to assist the process: freedom of entry, freedom of exit including bankruptcy, freedom of tariff setting and non discriminatory licensing.

4.69 These reforms should benefit from international technical assistance. The on-going TRACECA project in this field covers simultaneously several countries with a limited budget, focuses on providing multi-country participant seminars and thus cannot address the specific and urgent needs of Armenia where a special focus is necessary to define the freight forwarding profession's potential status, prospects and needs, within the perspective of multimodal or "combined" transport development.

4.70 Particular areas for consideration for such technical assistance include the following:

- provision of the necessary conditions/business environment to attract private sector investment;
- direct assistance in the setting-up and organization of freight forwarding organizations; and
- liaison with international bodies such as UNCTAD and others.

4.71 Discussions with both public officials and private operators should be centered on how to develop and professionally organize "third party" transport provider companies that will manage the total transport operation locally and overseas, and that will schedule and plan shipments carefully.

4.72 In the process of setting up a freight-forwarding profession, it is necessary to collect, review, and discuss the virtues and pitfalls of several countries' Statutes of National Freight Forwarding Associations, and/or Standard Trading Conditions according to which freight forwarding services are offered, which now prevail, for example, in Estonia, Poland, Hungary, Ukraine, the Russian Federation and Switzerland, the latter being a land locked country as is the case for Armenia. These two types of documents (Trading Conditions and Statutes), along with a Freight Forwarders Code of Conduct which defines the characteristics of professions entering this category, are necessary to structure the establishment of the profession.

4.73 It will be necessary to assist Armenia in selecting the format and articles of these documents and in setting up the process of reaching a consensus on the text most adapted to the country and regional conditions. It is also necessary to help set up the training needs for the profession, and to outline a program consistent with other countries' curricula. Finally, if sufficient progress is made on the adoption of the statutes, the country should be assisted through the formalities necessary to join FIATA. A census of the professions and operators eligible to be freight forwarders should be established (state, semi-public, private, national or foreign representations), along with the relevant offices in Ministry of Transport and in the Ministry of Industry and Trade. This survey should be conducted as a fact finding mission to identify the issues, establish the parameters, assess the state of difficulty to be expected in reaching a consensus, locate the interlocutors, make recommendations as to the composition of the constituting party, assess the availability or need of additional expertise, give a series of preliminary lectures on the process, provide startup documents, and put in place a procedure to make progress in identifying issues or opportunities with different articles. Working sessions would finalize the constituting documents and the charter membership in consultation with various stakeholders.

4.74 **Costs Associated with Corrective Measures.** *Building up a freight-forwarding sector should be a significant element in the Government 's reform program. The necessary technical assistance to achieve this goal as described above is estimated to cost US\$0.5 million, in addition to the existing training programs available in this field.*

### **C. Further Benefits - Trade and Welfare Gains**

4.75 In addition to the pure transport and services cost reduction effects on the balance of payments, the decrease in the CIF cost of goods will expand trade by decreasing the domestic price of imported products, provided that they are not subject to restrictive quotas (welfare gains), and increasing Armenia's exports to traditional and new markets (trade gains).

4.76 From an imports perspective, welfare gains arise from the benefits that consumers in Armenia derive from the lower domestic prices after the removal or reduction of the ad-valorem incidence of non-tariff distortions. The net welfare gain is estimated as the increase in import value times the difference between the ad-valorem incidence of the barriers before and after elimination.

4.77 On the export side, trade gains are obtained simply by summing the trade-creation and trade-diversion effects. The *trade-creation* effect is the increased demand in an importing country for a commodity from an exporting country, resulting from the price decrease associated with the elimination or reduction of distortions. *Trade-diversion* accounts for the tendency of importers to substitute goods from one source to another in response to a change in the import price of supplies from one source. The elasticity of substitution between alternative suppliers observed in trading economies is about 1.5, assuming that Armenia, as an exporting country, has no significant supply constraints in the medium term.

4.78 For each ad-valorem percentage cost reduction, a trade gain can be computed as the sum of trade creation and of trade diversion. In all, the expected balance of payments improvement linked to these trade gains is close to US\$60 million per year. It should be noted that this total does not include additional gains from potential transit traffic growth.

---

## V. ROADS AND ROAD TRANSPORT

5.1 Armenia's economy is highly dependent on road transport, both for the internal movement of goods and people and for the regional traffic that is essential to keep the economy functioning. However, the country's road network is in a state of serious deterioration due to the severe budget cutbacks for road maintenance that have occurred since 1991. Also, the inter-urban and municipal transport companies, which are still mainly state-owned, have old equipment, severe financial difficulties and lack access to investment for renewing their fleets. The critical issues are identified and discussed in the following chapter.

### A. Road Infrastructure

#### Current Situation

5.2 Public Roads. The total road network in Armenia is just under 7,800 km (see Table 2.1), of which 77 percent are paved. The road network is divided into *Interstate Highways* (1,440 km), *Regional Roads* (2,621 km) and *District Roads* (3,727 km). The Interstate Highways include 60 km of four lane highways serving the highest density routes. The system includes 829 bridges, 13 of which are wooden. The mountainous terrain of Armenia determines where people can live, and in general also the need for location of the roads. The existing road network with a density of 0.26 km per sq km is adequate for the traffic needs at this time.

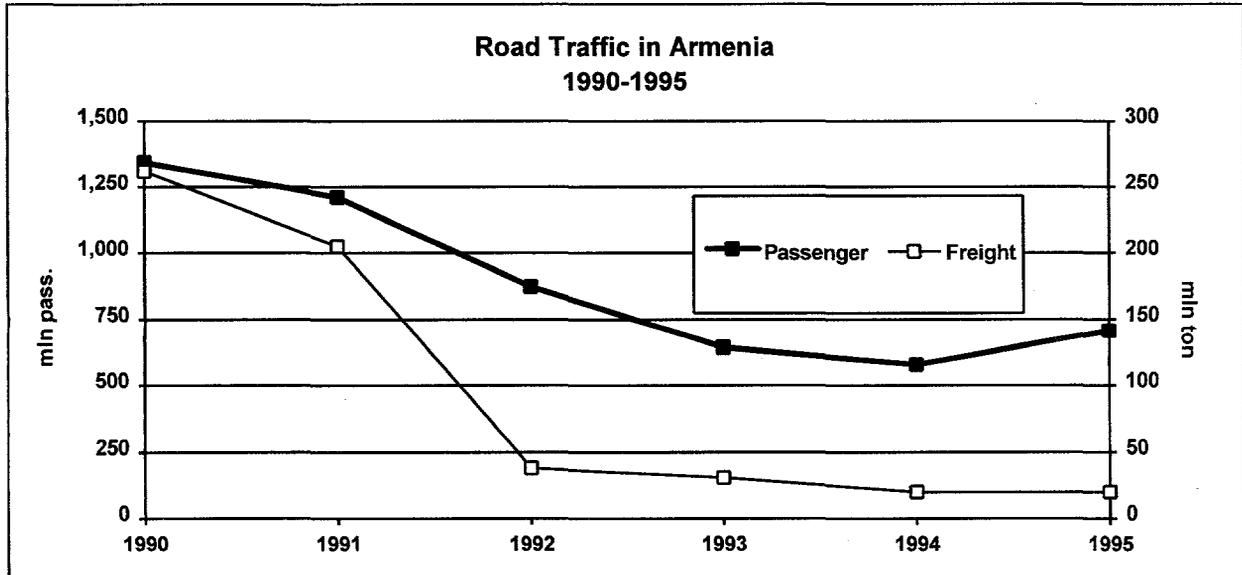
Table V.1 Armenian National Road Network

Type of Road	Paved		Unpaved		Total km
	km	percent	km	percent	
Interstate Highways	1,411	98	29	2.0	1,440
Regional	2,192	83.6	429	16.4	2,621
District	2,247	65.1	1,300	34.9	3,727
<b>TOTAL</b>	<b>6,030</b>	<b>77.4</b>	<b>1,758</b>	<b>22.6</b>	<b>7,788</b>

5.3 Traffic. Traffic levels are very much lower than they were in the 1970s, but have been increasing during the last two years. The decline in traffic levels reflects the critical economic situation of the past few years when the size of the Armenian economy declined by more than 60 percent as a result of the breakup of the Soviet Union and the problems associated with the conflict over Nagorno-Karabakh, which provoked the closing of the Turkish and Azeri borders. The recent increase in traffic reflects the gradual recovery of the economy in the recent past.

5.4 Traffic counts on the Interstate Highways carried out in 1994 found that nearly 83 percent of the network was carrying less than 3,000 vehicles per day (vpd). Heaviest traffic was concentrated on the dual highways radiating outward from Yerevan, with the highest vpd of 4,500

on the Yerevan-Ashtarak highway. Passenger car traffic accounted for around 75 percent of total vehicle kilometers, while heavy trucks of three or more axles made up only 8 percent of the total. A spot survey of traffic in 1996 compared to 1994 on selected roads showed an increase of 38 percent, with maximum vpd of 9,600 on the Yerevan-Ashtarak highway (see Figure V.1 below and Table 5.1, Statistical Appendix for Ministry of Transport traffic estimates on selected roads).



**Figure V. 1** Source: Ministry of Transport and Mission Estimates  
Data includes public, non-registered and private road transport

5.5 Climate and terrain. Extensive areas of the highway network cross mountainous terrain and altitudes often exceed 1500 meters. Steep gradients, deep cuttings and high embankments are common in these areas, and landslides occur frequently. The severe winter climate, especially in the more mountainous areas of the country where heavy snowfalls are common, require substantial efforts to maintain access. In many areas of the network, high intensity rainfall and poor road drainage cause traffic problems and road damage. The extreme climate has an influence on the behavior of road pavements, particularly as a result of the action of freezing and thawing in the spring.

5.6 Road conditions. The road conditions of the Interstate Highways were surveyed in July 1994<sup>8</sup>. The result of the survey is summarized as follows:

8.3 percent	Visible defects of less than 5 percent of surface. No structural failures;
54.7 percent	Defects over less than 30 percent of surface. In general structure is still sound, but localized reconstruction of top pavement layer required;

<sup>8</sup> Survey carried out by TecEcon, assisted by the Armenian Road Directorate (ARD), on a program financed by EU-TACIS.

27.3 percent	Defects over at least one third of pavement area with some signs of early structural failure. Critical condition, but appropriate pavement seal will save structure;
5.0 percent	Extensive evidence of significant structural failure. Extensive repairs to prevent complete failure;
4.7 percent	Pavements have failed. Complete reconstruction required.

Tables 5.3 b and 5.3 c of the Statistical Appendix provide information on vehicle operating costs based on road conditions.

5.7 The cost of the rehabilitation of this portion of the road network (1,411 km), as calculated by the consultant and modified somewhat when reviewed by IDA, was US\$20.3 million if carried out at that time. A visible inspection of a portion of the main road network in 1995 revealed that serious additional deterioration had occurred since the 1994 survey as no periodic maintenance had been carried out in the interim. It is apparent that the road pavements are deteriorating at an accelerating rate, a trend that can be expected to continue until road maintenance activities match the rate of deterioration. Based on an extrapolation of this study, the total cost of the deferred maintenance for the entire road network is in excess of US\$100 million.

### Road Safety

5.8 The road safety situation in Armenia is very poor by international standards. The statistics (see Table V.2 below) show that the number of accidents and fatalities have declined during the past several years but this is due to the sharply declining traffic volumes and poor accident reporting rather than any improvement in basic safety standards or conditions. While no reliable figures exist for the number of vehicles in the country (see Table 5.3a of the Statistical Appendix for vehicle fleet estimates), a comparison of fatalities per 10,000 inhabitants in 1990, when traffic was at a more normal level, with 17 other countries with vehicle densities in the same general order of magnitude (100 vehicles per 10,000 inhabitants) such as Bolivia, Egypt, and the Philippines shows that the Armenian level of fatalities per 10,000 inhabitants was higher than all but two of these countries in 1990.

**Table V.2** Traffic Accidents on Public Roads and Streets

	All accidents with Personal Injuries	Fatalities	Fatalities per 10,000 pop.
1990	2,069	721	2.0
1991	1,876	633	1.7
1992	1,416	519	1.4
1993	898	318	0.9
1994 (10 months)	620	207	0.6

Source: Ministry of Transport.

Table 5.2 of the Statistical appendix provides data on traffic accidents on public roads only.

5.9 Responsibility for road safety is shared by the Ministry of Transport and Communications (MOT), ARD and the Traffic Police. While there is some overlapping of responsibilities, generally they are as follows:

- MOT, through its Office of Road Safety and Line Control Administration, is responsible for inspecting the adequacy of road signs and markings, investigating road accidents, training of drivers for Government-operated vehicles, the condition of Government-owned vehicles, and the overall coordination of road safety;
- ARD, through its Road Utilization Office, is responsible for assuring that safety considerations are included in the design and maintenance of roads;
- The Traffic Police are responsible for vehicle registration, driver training, testing and licensing, recording and analyzing road accidents, enforcing traffic regulations, and monitoring the installation of the safety aspects of road works.

5.10 In practice, these responsibilities have not been effectively carried out in recent years because of the shortage of budget resources, which has resulted in inadequate facilities to carry out the work.

5.11 A consultant is presently working with all agencies involved in Road Safety to prepare a Road Safety Plan. The grant is funding consultant services to include the following tasks:

- (a) undertake a Road Safety Survey recording the present situation and identifying existing strengths and weaknesses; and
- (b) in close cooperation with the bodies responsible for Road Safety in Armenia, assist in developing a comprehensive Road Safety Plan.

5.12 The Plan will identify priority actions needed to improve the institutional aspects and will recommend road safety activities to be undertaken during the next four years. The Plan will become the basis for road safety activities to be carried out with the assistance of grant funds to be sought from other sources.

### **Highway Organization**

5.13 The Armenian Road Directorate (ARD) has responsibility for the construction and maintenance of the national road network. ARD is a public agency operating on a semi-independent basis under the authority of the MOT. Prior to Independence, ARD utilized the services of a multiplicity of public enterprises for engineering design, construction, and the production of aggregates and other materials for the maintenance and construction of the public road network. Since Independence, some of the construction and engineering design enterprises have been privatized, and those still publicly owned must obtain their budget resources for work performed from ARD or other public or private companies. Routine road maintenance, however, is

still carried out by 37 State-owned District Enterprises presently being reorganized into fewer units. 9 of the District Enterprises were privatized in 1996 and an additional 19 will be privatized before the end of 1997, the privatized firms being totally independent of ARD. Since 1996, all periodic maintenance is awarded on a competitive bid basis. Much of the equipment owned and operated by the District Enterprises is poorly designed for its task or is no longer operational. The equipment repair facilities are generally poorly equipped and there are difficulties in obtaining spare parts for any items manufactured outside of Armenia.

5.14 Personnel. The total employment level in ARD-related operations was estimated by ARD to be 4,280 people in 1994. This was a reduction from about 10,000 people employed three years earlier. The District Enterprises employed about 3,800 people (89 percent of the total number of employees), the central ARD office had 68 employees, and the rest were employed by the Design Institutes.

5.15 ARD personnel appear to be competently trained in engineering skills. However, the engineering staff has been isolated from the advances in road techniques developed in the Western economies over the last few decades. Also, there has been a general lack of awareness by ARD's staff of cost analysis techniques as a basis for making choices regarding pavement management strategies, materials and equipment, as well as knowledge about contracting and procurement procedures. The World Bank project has contributed to remedy this situation.

### Highway Expenditures

5.16 Budget Levels. ARD's budget allocations for new roads, capital expenditure/reconstruction, periodic and routine maintenance and its conversion into constant 1989 prices, as calculated by ARD, is presented in Table V.3 below. US\$ equivalent road expenditures for 1989-1996 are presented in Figure V.2.

**Table V.3 Past Budget Allocations**

	1989	1990	1991	1992	1993
Current prices (Rubles million)					
New Roads	40.8	52.4	80.2	108.0	1,234.6
Capital Expenditure/Reconstruction	43.2	45.5	55.4	283.9	1,140.0
Periodic Maintenance	13.3	15.0	33.9	99.2	926.9
Routine Maintenance	16.5	16.5	21.6	227.2	1,645.3
<b>TOTAL</b>	<b>113.8</b>	<b>129.4</b>	<b>191.1</b>	<b>718.3</b>	<b>4,946.8</b>
Constant prices (1989 Rubles million)					
New Roads	40.8	52.4	50.1	4.3	3.2
Capital Expenditure/Reconstruction	43.2	45.5	34.6	11.3	3.0
Periodic Maintenance	13.3	15.0	21.2	4.0	2.4
Routine Maintenance	16.5	16.5	13.5	9.1	4.3
<b>TOTAL</b>	<b>113.8</b>	<b>129.4</b>	<b>119.4</b>	<b>28.6</b>	<b>13.0</b>

5.17 Inflation has caused a reduction in ARD's budget for 1993 when measured in constant prices to about 12 percent of the 1989 level. The 1994 level was further reduced to about 1 billion drams, equivalent to about US\$2.4 million, which is about 3 percent of the 1988 level. Only about 20 percent of this amount was actually made available to ARD in 1994, although the balance of the 1994 budget was paid to ARD in early 1995. Some of the decrease in budget resources was absorbed by a reduction in real average wages, and some work was carried out by borrowing funds or supplies from local authorities interested in keeping the roads open. The situation improved somewhat in 1995, with a budget of 1,650 million drams (about US\$4.1 million), although as in 1994, some of that amount was not made available until 1996.

5.18 In 1996, the ARD budget was reduced to 1,276 million drams (US\$ 3.0 million), but was augmented by IDA financing for a program of periodic maintenance, equipment, and bitumen for routine maintenance. The actual combined resources of the budget and IDA disbursements would amount to the equivalent of about US\$ 13.0 million (net of 1995 arrears).

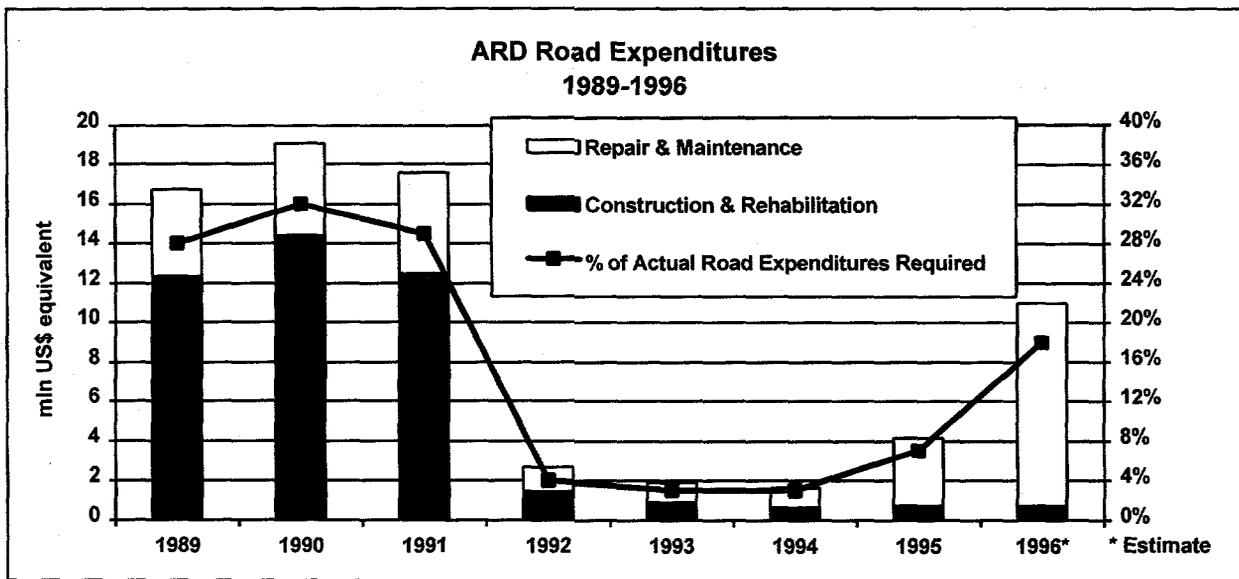


Figure V. 2 Source: ARD, Ministry of Transport and Mission Estimates  
Based on actual road expenditures requirements of US\$60 million per year.

**IDA-Financed Highway Project**

5.19 The World Bank, recognizing the deteriorating condition of the Armenia road network, responded favorably to an Armenian Government request for assistance to increase the funding available for road maintenance. In August 1995, an IDA Credit was approved to support a project with the following objectives:

- (a) To help preserve the Armenian national road network and reduce transport operating costs by expanding maintenance operations, including bridge and tunnel rehabilitation;
- (b) To help develop an institutional framework adapted to the requirements of the road sector in a market economy;
- (c) To expand the resource base for road maintenance by encouraging appropriate road user charges;
- (d) To assist in developing an effective private road construction and engineering industry; and
- (e) To improve road safety.

5.20 An IDA Credit of US\$16 million combined with co-financing from the EBRD, France and the EU for a total project cost of US\$36.9 million was mobilized to finance a four year program of urgently needed highway maintenance and a program of technical assistance and training directed toward institutional strengthening and improved efficiency of Armenia's road maintenance operations. The main components of the proposed project are:

- (a) Periodic Highway Maintenance. Surface dressing, overlays and reconstruction of priority sections of the Interstate Highways;
- (b) Bridges and Tunnels. The repair of priority bridges and tunnels, and the provision of equipment needed to establish and begin operation of a bridge inspection system;
- (c) Materials for Routine Maintenance. Bitumen for the routine maintenance of the entire paved national road network and fuel for winter maintenance would be financed under the project in order to expand the amount of routine and winter maintenance to be carried out by ARD;
- (d) Equipment and Spare Parts. Equipment needed to permit the introduction of new technology and improved quality of road repairs, and spare parts needed to keep existing equipment functioning;
- (e) Institutional Strengthening and Technical Upgrading. Consultant services, equipment and training to assist ARD to reshape its organization and operational procedures so that both routine and periodic maintenance can be carried out on a contract basis with private contractors instead of on a force account basis, to introduce cost benefit techniques, to improve quality control, to improve planning, road research and technology transfer capabilities, to develop and start implementing a road safety plan, to install a system of axle weight controls, to carry out a study on financing of road maintenance and generally to improve the efficiency of operations for road maintenance. This component would also include training for the private road construction industry in contracting procedures, business administration and project management; and
- (f) Project Implementation. Support for an office within the ARD to manage project activities, including the preparation of specifications and bidding documents, handling procurement and project accounting, and the arrangements for training activities financed by the project.

5.21 Good progress has been made in implementing the first year's program of civil works, and of strengthening ARD by a major restructuring of its internal operations through the creation of a Project Implementation Unit that is learning how to use cost calculations and careful programming to determine the most cost effective solutions to highway maintenance planning.

### Road User Charges

5.22 During the Soviet era, funds were collected from enterprises, collective farms and trade organizations by a form of business turnover tax (also called Road Tax) devoted to upkeep of the road network. These taxes lapsed in 1991 due to the low level of business activity, and so there were virtually no road user charges in effect in Armenia at that time. Starting in 1995, however, as part of a package of measures worked out with the IMF, the Government initiated a vehicle registration fee for all vehicles at a rate equivalent to about US\$7 per vehicle, which is now in effect. Also, the Government reactivated the business turnover tax in 1996, although collections have been minimal. More recently, the Government decided to replace the turnover tax with a 12 percent surcharge on the fuel excise tax, to go into effect in January 1998, and planned to submit the legislation to the Parliament before November 20, 1996. The surcharge is expected to generate about the equivalent of US\$6.0 million additional resources each year, with the funds paid into the general revenues but with the intention that they will be used for road maintenance. *Cost recovery of damages to roads by traffic are not general revenues, and a direct availability of these funds for ARD is recommended.*

5.23 The Government is also considering additional possible road user taxes and charges to augment or replace the fuel excise tax, including the following:

- Transit tax
- Axle load tax on large trucks
- Taxes on the procurement of buses and trucks.

5.24 None of the proposals presently under consideration offers a reasonable prospect of generating sufficient funds to maintain the road network that is presently in place. The level of funding required is difficult to calculate under present unstable economic conditions, but is on the order of US\$40 million plus some additional amount for reducing the backlog of deferred maintenance. The maintenance budget under the old system was around US\$60 million per year, and ARD's estimate of its funding requirements for maintenance is over US\$65 million per year. In that case, with the current road user charge proposal, the financial shortfall would exceed US\$50 million/year (see Table V.4 below and Tables 5.4 and 5.5, Statistical Appendix).

5.25 The institutional and technical improvements for highway maintenance included in the Highway Rehabilitation Project are expected to yield savings in the cost of maintenance, which should help to reduce the requirement somewhat. However, the order of magnitude of even the lowest estimate is beyond Armenia's present ability to raise, given the present state of the economy

(total Government revenues in 1996 from all sources for all purposes are now estimated to be about US\$180 million). Nevertheless, it is imperative that Armenia address the need for an adequate level of maintenance if it is to serve the needs of the economy for efficient, low cost transport. *The cash flow projections of Table V.4 clearly indicate that the applications of funds hoped for are not feasible, and cost recovery needs to be improved further.*

**Table V.4. Armenian Road Directorate - Summary Cashflow Projections (US\$ mln)**  
*-- Based on ARD's maintenance budget estimates --*

	1995 *	1996	1997	1998	1999	2000	2001	2002
ARD Staff	3,245	2,035	825	750	700	700	700	700
<b>Sources of Funds</b>	<b>15.45</b>	<b>18.16</b>	<b>17.29</b>	<b>7.91</b>	<b>6.54</b>	<b>6.67</b>	<b>6.80</b>	<b>6.94</b>
of which:								
Budget Allocations	4.95	-	-	-	-	-	-	-
Divestiture from Assets	-	2.00	2.00	-	-	-	-	-
Fuel Tax Revenues	-	6.16	6.29	6.41	6.54	6.67	6.80	6.94
Highway Prjct Loan (WB)	10.50	3.00	2.50	-	-	-	-	-
Add. Loan (EBRD)	-	7.00	6.50	1.50	-	-	-	-
<b>Applications of Funds</b>	<b>15.43</b>	<b>50.83</b>	<b>72.47</b>	<b>88.40</b>	<b>84.35</b>	<b>77.85</b>	<b>65.75</b>	<b>49.46</b>
of which:								
Interstate Roads	13.19	18.72	18.72	17.49	17.46	17.16	5.74	5.74
Republic Roads	-	19.00	19.00	19.00	18.05	17.75	17.18	17.18
Secondary Roads	-	9.38	15.99	15.99	16.31	16.31	16.02	16.03
Other Maintenance/Rehab.	-	-	15.40	33.45	30.00	24.00	24.00	7.50
Surplus Funds	0.02	(32.67)	(55.18)	(80.49)	(77.82)	(71.18)	(58.94)	(42.53)
Closing Cash Balance	0.02	(32.65)	(87.83)	(168.32)	(246.13)	(317.31)	(376.25)	(418.78)

Above estimates assume that the new road user charge legislation, as presented in para. 5.22, is passed in 1996.

\* Actual, 1995.

## Design and Construction

5.26 Road classification and design standards. The design standards used for the Armenian roads are the same as those used by the former Soviet Union. The geometric standards of the existing roads are generally adequate except in difficult mountainous terrain where hairpin bends and other reduced standards are common. The road carriageway and shoulder design width are often too wide for the present traffic needs. The original pavement design was adequate, and in most cases the bearing capacity of correctly constructed roads will suffice subject to axle-loads being controlled and pavements maintained. However, with an expected increase of heavy load traffic on some international routes, pavement strengthening will be required, and drains, which are often substandard, need upgrading.

5.27 Axle load information. Although the pavements of the most recently constructed main roads are designed to the Soviet GOST design standards based on 10 tons standard design axle load, most roads are constructed for 6 ton axle load only. Presently the legal single axle load limit is 10 tons, but no information is collected on actual axle loads. ARD is aware, however, that loads of scrap metal and bulk goods considerably heavier than this limit are being hauled on the highways, causing serious wear and deterioration to the pavements.

5.28 Construction quality. Almost all of the road network was constructed during the FSU period to a generally adequate design standard, followed by a period of generous maintenance. However, poor quality control and poor workmanship offset these advantages. In particular poor drainage provisions, poor compaction, poor control of vertical finish, incorrect grading of aggregate, use of unsuitable types of bitumen for surface dressing, and uneven bitumen distribution have resulted in a road network with many problematic areas where reconstruction/strengthening is now required.

### **Environmental Procedures and Issues**

5.29 Until recently, environmental considerations were given only marginal consideration (see Chapter VIII on Transport and Environment for further details). The design institute provided limited consultant services to determine pollutant counts from alternative materials relative to asphalt production, but had no experience with the application of either mechanical or electrical filters for effluent. After serious environmental problems with their chemical industry, Lake Sevan and a debate about reopening of the nuclear power station, the public is now more environmentally aware than in the past.

5.30 In 1991 the Ministry of Nature and Environment (MNEP) was established with responsibility for making policy and promulgating standards relevant to environmental protection. Regulatory and licensing systems were put in place that require the consideration of environmental issues in the design and implementation of development projects. The MNEP must sign off on all designs for road works, and MNEP-issued licenses are required for the operation of all quarries. Also, the MNEP is in the process of preparing a National Environmental Action Plan (NEAP), which will be ready by June 30, 1997, as well as reviewing a variety of policies and regulatory standards. In general, the measures already in place and under preparation appear to be adequate to safeguard the environment in connection with road work.

### **Requirements for Major Road Reconstruction and New Construction**

5.31 For the past several years, attention in the road sector has been directed almost entirely toward the requirements for maintenance of the existing road network, as was appropriate. However, it is timely to begin consideration of the requirements for larger scale reconstruction and new construction that may be needed as Armenia's economy expands and as the political situation evolves. The principal issues revolve around the prospects for a permanent peace with Azerbaijan, and the possibility of the border with Turkey opening even before a permanent peace is achieved.

Also, the prospect for attracting private capital for road improvements, particularly for tunnel construction through mountainous areas, bears investigation.

5.32 Major Road Links to Neighboring Countries. Under present conditions in which the borders with Azerbaijan and Turkey are closed for both road and rail traffic, the principal routes for access outside of Armenia are the Yerevan-Goris-Meghri link to Iran (average vpd of 777), the Yerevan-Ghumri-Bavra link to the port of Batumi in Georgia (average vpd of 1,405), the Yerevan-Spitak-Bagrateshen (average vpd of 2,447) and Yerevan-Spitak-Tashir (average vpd of 3,436) links to central Georgia. However, if the closed borders are opened (see Chapter III on possible scenarios), the traffic patterns can be expected to change significantly. The optimal route from Yerevan to central Georgia is the one through Sevan and Dilijan, which passes through Azerbaijan on its way to Tbilisi, and traffic on this road can be expected to rise significantly. The optimal route for most of the traffic to Iran would pass through Nakhichevan, bypassing Goris and Meghri. And the major route for most international traffic would be through Turkey via the road from Yerevan to Karakala.

5.33 The routes that would become important for traffic under the condition of open borders would require major renovations as these roads have been given low priority for maintenance since they have had little traffic. However, in most cases the road sections in need of repair are not lengthy, and the expense to renovate them would not be extreme. Nevertheless, the need to maintain alternative routes for differing political situations will lead to higher road maintenance costs than would otherwise be the case.

5.34 Another possible investment in new roadways is the tunnel near Lake Sevan on the route to Georgia that passes through Azerbaijan. Funding has been sought from Germany to finance a consultant to carry out a study to determine the feasibility of completing the tunnel, with toll charges to serve as the basis for repayment of the foreign investment. The probability of attracting a foreign investor would be enhanced by the use of a World Bank guarantee to cover certain of the risks such as repatriation of capital, for a small fee paid by the foreign investor.

5.35 There may be other possible road improvements that could be financed by the utilization of foreign funds with repayment generated by tolls, such as for expressways on important routes like the Yerevan-Ashtarak highway. However, experience elsewhere has shown that except under unusual circumstances, toll roads of this type are only economic when traffic levels reach 20,000 vpd.

5.36 Operation Crossroads (Khachmeruk). The Ministry of Urban Development has proposed that the Government undertake the construction of a comprehensive communications network, including highways, rail, fiber-optic cables and energy pipelines, consisting of two corridors running East-West and North-South through Armenia. The East-West corridor would run from Turkey on the West to Azerbaijan on the East (320 km in length), and the North-South corridor would run from Georgia on the North to Iran on the South (465 km in length). The first phase would include only the transport links (highways and rail), expected to take about 10 years to

complete and to cost about US\$1 billion to construct. The Ministry is seeking aid funds to carry out a feasibility study to determine the economic viability of the project at an estimated cost of US\$1.3 million. Financing the construction phase would require substantial loans from international and bi-lateral financing institutions.

5.37 At present, the traffic on the roads included in the proposal is not heavy (1,000 to 3,000 vpd), and would not justify any significant upgrading. Considered in the context of Armenia's present financial situation, its limited ability to finance the maintenance requirements of the existing road network, the many other options for the use of international financial resources that may become available, and the uncertainties regarding the future levels of traffic on the proposed corridors, *it is not likely that this proposal would be considered of priority for Armenia's investment program from some time to come. Therefore, it would not be a good use of grant funding to carry out the proposed feasibility study at this time.* A more practical approach would be to monitor the traffic growth on the existing road network along these corridors and consider upgrading sections of the network at such time as justified by actual experience.

### **Key Issues for Road Infrastructure**

5.38 The key issues for road infrastructure in Armenia relate to: (i) the need for an expanded level of financing available for the maintenance of the road network; (ii) continued measures to improve the efficiency of road maintenance operations; and (iii) the priorities for major new construction or reconstruction that will be needed as the Armenian economy expands and possible ways to mobilize the resources needed for this purpose.

5.39 Financing for the Maintenance of the Road Network. The lack of an adequate level of financing for road maintenance, as described in the previous paragraphs, is the most serious and urgent issue facing the Government regarding road infrastructure. It is apparent that the road network will continue to deteriorate at an increasing rate until a level of maintenance can be carried out on a regular basis that can both make up for the deferred maintenance that has not been performed, and meet the regular requirements for timely (and hence the most economical) maintenance of the network.

5.40 Two measures have been taken that will help the situation. First, the Highway Rehabilitation Project described in para. 5.20 will help to improve the conditions on the Interstate Highways, although the funding available for this purpose will not be adequate to restore even the entire 1,411 km of these roads, and nothing has been available for the periodic maintenance of the remaining 6,348 km of roads in Armenia's public road network. Second, the Government has made firm plans to introduce an increase in fuel excise taxes for increasing the funds available for road maintenance, as described in para. 5.22. However, the estimate for the funds to become available from this source are only about one-seventh of the amount needed for the maintenance of the road network each year. *The Government needs to confront the prospect of either finding a solution to the continuous lack of funding, or face the prospect that the road network will continue*

*to deteriorate, with extremely adverse consequences for the development prospects for the country, even if additional foreign financing can be obtained to meet some of the requirements.*

5.41 The Government appears to have accepted the basic approach adopted by most Western countries toward road maintenance requirements, namely that road users can and should pay for the services provided by the State of making roads available. That approach is based on the observation that road users are better off if they pay an amount that leads to a level of maintenance that reflects the lowest cost of vehicle operations when all costs of those operations are taken into consideration (road maintenance, vehicle operating costs, transport time, etc.). Most countries have determined that the optimal system of charges is that which most directly relates the road user charges to the actual user. This usually results in a system of charges that include:

- Fuel taxes, which usually account for 70 to 80 percent of the total road user charges;
- Vehicle registration fees;
- Charges for heavy loads commensurate with the extra damage that these loads do to the roads;
- Cross-border fees that compensate for the absence of vehicle registration fees for foreign vehicle owners.

5.42 In addition, some countries have found that toll road charges can serve as a means of attracting financing for the construction of through-ways, tunnels and bridges that offer road users special savings in transport costs but toll roads in general require traffic levels in the order of 20,000 vpd. The use of general revenue taxes like the business turnover tax (or Road Tax) for the generation of road user charges is discouraged, since these charges are not very well related to the actual road use of any particular enterprise. Last but not least, most Western countries have also established collection procedures ensuring proper road user charge collection performance and that all proceeds from road user charges are exclusively used by the entity responsible for road maintenance and rehabilitation.

5.43 Recent Government actions indicate that Government officials are aware of, and accept, these principles. Experience in other countries indicates that road users are willing to pay much higher rates. This also has the advantage of equalizing the cost of alternative means of transport, thus leading the users to opt for the most economic solution to their transport requirements.

5.44 Improvement in the Efficiency of Road Maintenance Operations. If road users are to be charged for the full cost of road maintenance, then it is imperative that the Government take all available steps to reduce the cost of road maintenance to as low a level as possible. There are a number of measures that can reduce costs, as follows:

- The use of cost analysis for determining the optimal timing and design solutions for road maintenance;

- Improvements in design standards and the introduction of new technology based on research in the use of alternative materials and technologies;
- The use of contracting and competitive bidding procedures for both periodic and routine maintenance, based on the privatization of the road maintenance enterprises; and
- Improvements in the quality of the work through appropriate testing and inspection.

5.45 ARD has made excellent progress in utilizing a number of these techniques, in connection with the implementation of the Highway Project referred to in para. 5.20. The further privatization of District Enterprises that would be completed by April 1997 is expected to ensure adequate competition. The techniques for the use of contracting for routine maintenance also needs further development.

5.46 Priorities for New Construction and Reconstruction. The ARD has prepared and keeps updating plans, based on transport economic evaluation, for future periodic maintenance needs. However, it is timely for the Government to plan improvements of the road sections that need major reconstruction or new construction in the next several years. This should be done in anticipation of the most likely political developments, and should give priority to the links that would foster the most rapid economic development. The planning should include the possible sources of financing, the possible use of tolls, and the priority of the road investments compared to other possible transport investments. It is likely that the opening of closed borders, especially to Turkey, would give the highest priority to the improvement of the road sections that would then come into use. However, these decisions should be grounded on careful economic analysis based on projected traffic flows and the cost of the road improvements.

## **B. Road Transport Services**

### **(Urban Transport and Inter-Urban and International Trucking and Bus Transport)**

#### **Current Situation of the Road Transport Industry**

5.47 The road transport industry in Armenia consists of an array of public sector enterprises serving inter-urban, international and urban transport needs. The Government, in line with its policy of privatizing much of the public sector, has placed a number of the inter-urban enterprises on the privatization list for 1997. Private operators of minibuses have begun to operate in the urban areas (mainly Yerevan), and are successfully competing with the public sector enterprises in both price and service.

#### **Yerevan Urban Transport**

5.48 Buses, Trolleybuses and Tramways. Ten publicly owned companies (besides the Metro) provide urban transport services in Yerevan. They are all under the authority of the

Overground Transport Department of the Ministry of Transport. Four of these companies deal with electric transport (tramways and trolleybuses), three operate diesel buses and the remaining three use gas -fueled buses. Basic data on over-ground urban transport operations is presented in Table V.5 below and Tables 5.10 and 5.11 of the Statistical Appendix.

5.49 The total number of vehicles under the jurisdiction of the Department is 1,200 (820 gas or diesel buses and 380 electric vehicles). Only about 50 percent are in working order, and all are old and are being used beyond their normal economic lives, resulting in excessive maintenance costs. 70 to 80 percent of the electric lines serving the electric transport system are in poor condition and need replacement. There has been no new investment in transport by the Department in the last seven years.

**Table V.5** Yerevan Urban Transport Basic Data, 1991-1995  
Sources: Ministry of Transport and Mission Estimates

	1991	1992	1993	1994	1995
<b>BUS TRANSPORT (diesel &amp; gas)</b>					
Average Tariff (UScents per passenger.km)	3.40	1.44	0.07	0.49	0.63
Transported Passengers (mln)	130.2	88.7	46.3	34.1	42.5
Passenger.km Traffic (mln passenger.km)	744.0	449.3	234.1	182.5	215.7
Average Trip (km)	5.7	5.1	5.1	5.4	5.1
Fleet	1,200	993	949	892	813
Utilization Coefficient (% of operating buses to total fleet)	51.0%	38.7%	17.8%	18.6%	22.6%
Revenues -- excluding budget allocations (US\$ mln)	25.30	6.51	0.17	0.90	1.36
Expenses (US\$ mln)	38.40	19.44	0.52	0.95	1.47
Profit/Loss (US\$ mln) *	-13.10	-12.94	-0.35	-0.05	-0.10
<b>ELECTRIC TRAMWAYS and TROLLEYBUSES</b>					
Average Tariff (UScents per passenger.km)	2.30	1.67	0.07	0.17	0.48
Transported Passengers (mln)	39.0	33.7	28.1	33.2	30.4
Passenger.km Traffic (mln passenger.km)	175.5	151.7	126.4	149.7	136.5
Average Trip (km)	4.5	4.5	4.5	4.5	4.5
Fleet	516	469	454	397	362
Utilization Coefficient (% of operating units to total fleet)	53.0%	52.0%	44.2%	40.9%	36.9%
Revenues -- excluding budget allocations (US\$ mln)	4.50	2.46	0.09	0.25	0.65
Expenses (US\$ mln)	22.70	16.16	0.39	1.20	1.91
Profit/Loss (US\$ mln) *	-18.20	-13.69	-0.30	-0.95	-1.25
<b>METRO OF YEREVAN</b>					
Average Tariff (UScents per trip)	12.50	7.56	0.39	1.08	4.01
Transported Passengers (mln)	49.2	52.2	73.9	71.4	55.4
Passenger.km Traffic (mln passenger.km)	187.0	198.6	280.8	271.3	210.4
Average Trip (km)	3.8	3.8	3.8	3.8	3.8
Fleet	61	58	62	70	70
Utilization Coefficient (% of operating units to total fleet)	79.6%	77.8%	79.0%	74.9%	65.2%
Revenues -- excluding budget allocations (US\$ mln)	6.11	3.94	0.22	0.58	1.70
Expenses (US\$ mln)	15.20	8.28	0.45	1.36	2.58
Profit/Loss before Budget Allocation (US\$ mln)	-9.10	-4.34	-0.23	-0.78	-0.87
Budget Allocation (US\$ mln)	7.00	5.60	0.27	0.65	0.78
Total Profit/Loss (US\$ mln)	-2.10	1.26	0.05	-0.13	-0.09

\* Losses were at least partially covered by State subsidies until 1994

5.50 In the past, the public sector transport operations received Government subsidies, both to finance their operations and to make up for the loss of revenues that resulted from the existence of privileged passenger fares (for children, soldiers, veterans, handicapped, some Ministry employees, and holders of one year passes). The privileged fares include both reduced fares and

even free passage for some of the groups. Because of severe budget constraints, the subsidies to the transport operations disappeared for bus transport in 1994 and were removed for electric transport in January 1995. Privileged passenger fares, however, are still in force and must be provided by the public urban transport companies<sup>9</sup>. The privileged passenger traffic represents about 47 percent of total public urban transport traffic.

5.51 Current (1996) regular public transport fares range from 20 to 50 Drams (5 to 12 cents) per trip. Total revenues are barely enough to meet out-of-pocket expenses, and nothing is available for the purchase of new equipment. All of the companies are experiencing losses, and will cease to operate when the present equipment is totally inoperative unless alternative operating procedures and strategies are put into practice.

5.52 As the service provided by the public sector companies has declined, private operators (mainly cars and minibuses) have begun offering urban transport services in Yerevan. *Today about 40 percent of the urban transport traffic is served by the private sector.* Fares are somewhat higher (50 to 100 Drams in 1996, depending on the route and transport mode), but close enough to secure a brisk demand for their services. The public sector companies would like to increase their fares in order to reduce their losses, but are afraid that even more traffic would shift to the private operators if they did so. The public sector companies believe that private operators can be profitable at existing fares because of the lack of regulation (private operators do not have to comply with any requirements such as to operate in the off hours or to accept privileged passengers<sup>10</sup>), and frequently do not pay taxes.

5.53 The Ministry of Transport is considering the expanded use of the private operators, but on a more regulated basis. One possibility would be to take bids for the operation of specific routes within the city, with the successful bidder committed to providing regular service on the route. The availability of private investment funds for this purpose seems likely to be forthcoming judging from the level of investment that has come forward to finance the existing private operators. Some agreement would have to be worked out to coordinate the interaction of the various privately operated routes if this system were to be adopted throughout the city.

5.54 Yerevan Metro Department. The case of the Metro of Yerevan is different from that of other urban transport modes. Its heavy infrastructure and the critical public service role it played during harsh years when dramatic fuel shortages and almost complete lack of spares and renewal equipment completely disrupted all other urban transport modes, make the Metro of Yerevan a

---

<sup>9</sup> As a step in the right direction, the Government recently proposed to eliminate *privileged* transport by January 1, 1997, and replace the old discounted fare system by direct subsidies for those in need. The effective implementation of this proposal, however, remains uncertain, particularly in light of recent contradictory decisions (see for instance next footnote).

<sup>10</sup> The Ministry of Transport, however, recently announced that private buses will also be required to accept *privileged* passengers at reduced fares. Only private minibuses would be exempted from this obligation. This is likely to slow down the expansion of private carriers.

particular and vital entity in the urban transport system of the city. Basic data for the Metro is presented in Table V.5 above and Table 5.12 of the Statistical Appendix.

5.55 The Metro of Yerevan was designed and built under Russian assistance and was put into operation in 1981. A single metro line links nine stations, with a total length of approximately 12 kilometers. Most of the line is underground and only two stations are constructed on ground surface. A line extension including three new stations is under construction, and a second line is presently under study, although Metro officials realize that such projects are not realistic under current financial constraints (see para. 5.70).

5.56 The Metro does not face the same operational difficulties as other urban transport modes. Its infrastructure and rolling stock are relatively recent. At current traffic levels, which substantially decreased after peaking at the height of the blockade crisis, it experiences no shortage of equipment. The main operational issue relates to water infiltration.

5.57 Ever since it started operations, the Metro experienced water infiltration and leakage problems in its deepest sections, encompassing 3 km of lines and 3 stations (Yeristasardakan, Republic Square and Zoravar Andranik). These infiltration problems not only jeopardize the overall sustainability of infrastructure and equipment in the long run, but they are a current threat to the safety of passengers and operators, and cost the Metro a substantial share of their operating costs in energy for pumping (about 20 percent of total Operation and Maintenance costs, and 1/3 of overall energy costs).

5.58 In order to operate the line under acceptable conditions (though not by European standards), a permanent de-watering system with a discharge of 6,000 m<sup>3</sup>/h is operating constantly. 3,500 m<sup>3</sup>/h are pumped through a de-watering network external to the structures and equipped with about forty water table lowering levels, while 2,500 m<sup>3</sup>/h leaks inside the structures and is pumped out through existing internal pumping stations.

5.59 An EU-sponsored feasibility study on investments to address this problem was recently carried out. Two investment options of US\$10.4 million and US\$7.6 million to limit water infiltration and facilitate sufficient water pumping were examined. Both are marginally economically feasible, with Internal Rates of Return (IRR) of 10 and 13 percent respectively.

### **Inter-Urban and International Transport**

5.60 Inter-Urban Transport. About 75 State-owned companies operate inter-urban domestic and international passenger and freight transport under the authority of the Ministry of Transport. Some of these companies provide freight haulage only, some provide passenger service, and some are mixed passenger and freight operators. Since no Government funds are available to provide subsidies or budget support, the 75 companies are intended to work as independent and commercial entities, with the Government acting only as a regulator. However (see para. 5.61 below), several constraints imposed on these companies make them neither independent nor

commercially viable. Fifty nine (59) of these companies are on the list for privatization in 1997. As of October 1996, no private sector companies are operating in inter-urban transport and there are no guidelines or regulations allowing private operators to offer services, although a licensing decree, which would allow legal entry into this field, is currently being drafted. Basic information on freight and passenger inter-urban and international transport is presented in Table V.6 below and Tables 5.6 to 5.9 of the Statistical Appendix.

**Table V.6** Road Transport Basic Data, 1991-1995 (excluding Yerevan Urban Transport)  
Source: Ministry of Transport and Mission Estimates

	1991	1992	1993	1994	1995
<b>TRUCKING</b>					
Total Traffic (th. ton)	68,854	13,780	2,692	2,611	2,499
Total ton.km Traffic (th. ton.km)	1,139,838	264,262	67,563	73,115	59,940
Average Trip (km)	17	19	25	28	24
Total Number of Trucks	9,955	8,561	7,782	6,805	5,624
Total Income (th.US\$ equivalent)	791	289	279	2,429	2,514
Average Revenue (US\$/ton.km)	0.1	0.1	0.4	3.3	4.2
<b>BUS TRANSPORT</b>					
Total Traffic (th. pass.)	183,294	85,830	24,078	29,846	38,272
Total Pass.km Traffic (th. pass.km)	2,359,039	1,114,850	378,116	442,351	606,074
Average Trip (km)	13	13	16	15	16
Total Number of Buses	2,854	2,889	2,789	2,664	2,470
Total Income (th.US\$ equivalent)	286	136	225	2,621	4,983
Average Revenue (US\$/pass.km)	0.01	0.01	0.06	0.59	0.82
<b>TAXIS</b>					
Total Distance of Trips (th. km)	142,921	30,010	10,546	10,390	3,400
Total Number of Taxis	3,075	2,105	1,619	1,426	1,379
Average Yearly Utilization (km/vehicle)	46,478	14,257	6,514	7,286	2,466
Total Income (th.US\$ equivalent)	225	34	17	170	758
Average Revenue (US\$/km)	0.2	0.1	0.2	1.6	22.3

*Note: Does not include private sector traffic & activity, which is not recorded*

5.61 The publicly owned companies still suffer from Government constraints in that they must comply with privileged passenger requirements without any compensation from the State, with about 40 percent of all inter-urban passengers in this status. The tariffs for inter-urban traffic are set by the Ministry of Transport, even though officially each inter-urban bus company has the right to request changes in the tariff structure. There is also public pressure to keep rates at a "socially acceptable" level.

5.62 International Transport. There is only one Armenian bus company that operates on international routes, linking Yerevan with different cities in Georgia, Turkey and Iran. This operation appears to be truly independent and commercially viable. For most destinations, the Armenian company works with its international counterparts in Georgia, Turkey and Iran to set fares at international levels. Also, there are no privileged passenger obligations on international routes. This company also operates domestic inter-urban bus transport on some routes, and cross-subsidizes the losses from these operations from the international transport operations. The international branch of the company is scheduled to become a joint stock company in 1997.

5.63 The main concern of the international company is how to secure financing and/or Government guarantees for the purchase of new and more efficient buses, and to expand its international network. International traffic has been expanding steadily in recent years, increasing at a 10 percent rate per year since 1992.

### **Key Issues for Urban and Inter-Urban Road Transport**

5.64 If allowed to continue on the present track, the public sector companies that provide transport services will cease to operate over the next ten years as their old equipment becomes entirely unserviceable. Also, it is highly unlikely that Government financing, either from current budget resources or from foreign borrowing, could begin to meet the needs for the new equipment that would be required to make these companies functional on a long term basis. At the same time, private financing seems likely to come forward to meet these needs, based on the experience with private transport services in Yerevan, once private operators are allowed to operate and tariff controls and exemptions are removed. Thus, the key issues for road transport in Armenia relate to how urban and inter-urban transport should be organized, financed and/or regulated in the years ahead, bearing in mind the limited Government resources that will be available to finance or subsidize these operations.

5.65 Inter-Urban Transport Issues. This sector of the transport industry is typified by the presence of a large number of small companies operating in many parts of the country and meeting a variety of needs. This is a situation that lends itself especially well to private company operations, where competition would be effective in keeping costs and fares low, with minimal need for Government regulation or intervention. There is no apparent reason for retaining any of these companies in the public sector, and to do so would only slow down the process of converting the industry to a more efficient status, able to provide better service at lower cost.

5.66 It is the Government's policy to privatize its public sector operations wherever possible, and some privatization in this area is already planned, as noted above. What is needed now is a plan outlining how to proceed with privatizing all of the existing inter-urban transport companies and allowing the formation of new private transport companies at the earliest possible time. Generally, operations of the private sector companies should be permitted to function with a minimum of regulation, but measures should be put in place that assure competitive operations without price fixing. Also, safety, vehicle licensing and environmental safeguards would need to

be established. It is likely that private financing will come forward once the private sector has a clear understanding of the rules and regulations under which it will operate. There is some urgency in developing and implementing such a program since the transport companies will not have access to finance for the renewal of their equipment until they have the status of private companies.

5.67 Urban Transport Issues (excluding the Metro Department). The problems of the urban transport system in Yerevan are more complex than those of the inter-urban sector, and a careful approach is needed in reaching final decisions. As in the inter-urban sector, there is a strong case to be made for urgent privatization of much of the system, even though there is a larger role for Government regulation of the resulting private operations through bidding of licenses or franchises. First, a determination of whether it is worth trying to preserve the electric vehicle operations, which are incurring substantial losses and which would require a substantial investment to renew, needs to be done. It is difficult to imagine that it would be advantageous to continue to operate the electric vehicle systems (except the Metro), but a final decision should await a careful study.

5.68 Next, a plan should be drawn up to divide the city into routes for bidding by private sector bus operators, as the Government is now contemplating. Some regulations would be required to assure that the successful bidders meet the terms of their proposals, and that appropriate arrangements are made for passengers to transfer from one private system to another without undue inconvenience. The routes should be drawn up based on whatever decisions the Government makes with regard to the Metro system, which should also be integrated into the overall transport program for the City. Fares would be based on the bids received, although some inter-route uniformity would need to be achieved to facilitate transfers. Informal private operators of small vehicles of the kind that operate in Yerevan would still be allowed to compete with the bus operations.

5.69 The most likely outcome of the above process would be that the Government would withdraw from all transport operations with the exception of the Metro, and would play essentially a regulatory role. This would require a minimum of direct Government financing of transport operations, thus conserving the Government's borrowing capacity for other types of investments.

5.70 Metro Department Issues. The main problem of the Metro Department is to find or generate enough funding to stop the erosion of its asset base and finance the urgently needed water infiltration and pumping project. The Metro Department is facing the typical financial difficulties that affect most transport sector entities. Its assets are largely undervalued and depreciation provisions are therefore too low. Tariffs and in this case modest and decreasing Government subsidies are not sufficient to cover the real costs of the services provided, and the Metro is also required to provide transportation at discounted fares to *privileged* passengers. Maintenance is only carried out whenever funds are available. The Metro is living off its asset base, and the financial shortfall, when proper depreciation allocations are accounted for, is estimated at about US\$3.5 million for 1995. Adding to this, the Metro is now suffering from increasing liquidity difficulties: accounts payable, mainly to the power supplier, reached almost two months of expenditures in 1995, or about US\$350,000.

5.71 Based on Metro Department financial information, a financial adjustment and restructuring plan was carried out, along with related traffic demand and financial projections for the 1997-2003 time period (see Tables 5.13 to 5.16, Statistical Appendix). The plan, which assumes a progressive phasing-out of all Government subsidies, would enable the Metro Department to generate enough debt and investment capacity to carry out the urgently needed investments related to water infiltration while avoiding further de-capitalization of its asset base.

5.72 As a minimum, the plan would include: (i) an asset revaluation program (a preliminary estimate would re-value net assets from current US\$6.7 million to slightly less than US\$100 million); (ii) a tariff increase program, ending all *privileged* passenger transport obligations and increasing current average tariffs of about 0.8 UScents/km (or 4.0 UScents/trip) to slightly more than 7.0 UScents/km (or between 25 and 28 UScents/trip)<sup>11</sup>; (iii) a staff reduction and salary increase program, adjusting staff levels from the current 1,440 people to about 1,200 while retaining qualified staff through salary increases of more than 20 percent/year; (iv) a cost reduction program including divestiture from non direct Metro activities and the sale of unused or unnecessary assets; and (v) an arrears repayment plan, exploring possible offsetting mechanisms (e.g., offset past budget subsidy arrears with current and future tax payments).

---

<sup>11</sup> If, as recommended in the present report, the restructuring of the Metro Department is carried out at the same time as the restructuring and privatization of other urban transport modes, the necessary Metro tariff increase is not likely to hamper its competitiveness against other urban transport modes. Today, some private urban transport bus drivers already charge 100 Dram (or about 25 UScents) per trip to cover their costs.

## VI. ARMENIAN RAILWAYS

6.1 Armenia has 845 km of mainly single track, wide gauge railways, practically all of which are electrified. The construction of some sections dates back to before 1900, with subsequent extensions and improvements. The electrification of the network was initiated before W.W.II. During Soviet times, the Armenian Railways were made an integral part of the of the Soviet Union Railways (SZD) and closely integrated with those in Georgia and Azerbaijan, constituting a central transport link in Transcaucasia. At that time, the Armenian Railways were transporting large quantities of cargo. The economic structure of the Soviet Union, which implied the transportation of considerable amounts of raw materials over long distances from all-over the country to specific factories, had given a strong preference to railway transport.

6.2 The break-up of the FSU deeply affected the Moscow-controlled SZD and the 32 regional railways that were part of it, including the Armenian Railways. All railways of the SZD became independent national railways in 1992, and Armenian Railways was formed as a State Enterprise of Special Assignment (SEPA). Most operational and technical standards, however, including for documents, tariffs, statistics, corporate structure and accounting, remained unified under CIS railways agreements.

6.3 The disruption of trade and payments agreements, energy tariff increases approaching international price levels, overall economic decline and the problematic transition to a market economy all contributed to traffic collapse. Adding to the difficulties, the economic blockade imposed on Armenia closed the railway links with Turkey and Azerbaijan. At the end of 1996, the blockade was still in place and the only international line that was being operated was the Yerevan-Sadakhou line to Georgia and its Black Sea ports of Poti and Batumi.

6.4 The present chapter addresses the major issues affecting the Armenian Railways. They relate to the organizational structure and staff levels, traffic demand which is depressed, operation and maintenance difficulties, and current financial strains.

### A. Organization and Staff<sup>12</sup>

6.5 The Armenian Railways is a State Enterprise of Special Assignment under the competence of the Ministry of Transport. The General Manager of the Armenian Railways reports directly to the Minister of Transport. The railways are organized on the same principle as many other FSU railways (see Table 6.1, Statistical Appendix, for the Organizational Structure of the Armenian Railways). Except for a few recent changes (see para 6.7), the highly centralized structure is based on FSU standards and is typical for a production-oriented railway that used to

---

<sup>12</sup> This section and part of the following benefited from information contained in an EU-sponsored report: Governmental Advice to the Railway Department and Management Training, Eurail Consult, May 1995.

operate in the environment of a planned economy and where freight traffic is dominant. It consists of Departments for Passenger and Freight Operations, Locomotive and Wagons, Track and Electric Infrastructure, Economic and Social Development, International Relations, and Safety. The heads of all these departments report to the General Manager who is supposed to make all final decisions. In practice, however, many decisions, in particular those regarding transportation of humanitarian aid cargo, are made directly by the Ministry of Transport.

6.6 Some departments like "Personnel Management" and "Marketing", which are traditionally important in most Western railway companies, are missing in the Armenian Railways' structure. Likewise, the current structure does not include owner's representation or any management decision level similar to a board of directors. Also, there is no clear or distinct "Financial Department"; financial issues are handled both by the General Manager and the head of the Economic and Social Department.

6.7 The railways also used to carry out numerous non-transport activities. These included social services provided by kindergartens, 3 hospitals and health facilities, a railway technical school and about 7,000 residential apartments for railway employees, and also commercial activities dealing with trade, capital investments and project construction. Over the past few years, however, the Armenian Railways have started to divest from several activities in the social sphere: two of the three railway-operated hospitals were transferred to the Ministry of Health and other organizations in 1994 and 1995, several kindergartens were closed down because of financial difficulties and railway staff reduction, and all railway-owned apartments are to be turned over to their tenants at a nominal fee by the end of 1996. The Armenian Railways plan to continue these downsizing efforts and only consider retaining within their structure a small medical section dealing with railway-specific health issues and the railway technical school (currently employing 24 people), whose role would be enhanced. Transformation of this school into an independent training center merits consideration.

6.8 Non-transport commercial operations, however, still play a substantial role within the Armenian Railways. This includes trade and catering of food, water and other supplies, transportation of electricity through the railways' electric network, and civil engineering and construction activities funded by the Ministry of Transport and other governmental entities to perform civil works, usually related to railway infrastructure. In 1995, these activities represented about 15 percent of total Armenian Railways' income (see Financial Issues below).

6.9 The number of employees of the Armenian Railways substantially decreased in recent years. This decrease is mainly due to current depressed traffic levels, lack of motivation from railway employees who quit their job because of low wages, and recent restructuring efforts undertaken by the Armenian Railways. Today, about 6,650 people are on the Armenian Railways payroll, down from almost 12,000 people in 1988. About 22 percent of Armenian Railways employees work in non-transport activities. Further staff reduction, however, appears necessary given current railway activity (see Restructuring in section F).

6.10 A detailed staff distribution by department and service is presented in Table 6.2 of the Statistical Appendix. The main departments are the Locomotive and Wagon Department (about 1,500 workers), the Operations Department (1,250), and the Track and Electric Infrastructure Department (1,050). The remaining employees are in non-operational activities like civil construction (300), capital repairs (300) or teaching and health care (450).

6.11 The current management structure and discipline do not allow effective distribution of responsibilities, and most decisions are taken in the office of the General Manager. Subordination is not clear enough and technically driven and decisions suggested by engineers tend to prevail.

## **B. Physical Description**

6.12 The Armenian Railways have 845 km of mostly single track, wide gauge (1,520 mm) lines which serving 72 stations. The Yerevan-Massis section (about 7 km) is the only double track line. The network also includes 440 km of sidings, 290 km of branch lines, 33 bridges (totaling 3.8 km) and 13 tunnels (13.3 km). 98 percent of the network, branch lines included, is electrified at 50Hz 25KV AC, and most of it is equipped with an automatic block system. The Armenian Railways use R-65 and R-50 rails, and all lines have been designed for a maximum axle load of 22.5 tons. About 230 km of tracks are on concrete sleepers, while the remaining 615 km rest on wooden sleepers which, on many sections, need to be urgently replaced (see Railway Operations below). The Armenian Railways also have three wagon or locomotive depots located in Ghumri (2) and Yerevan (1). The network is schematically presented in Figure VI.1 below, and in Map 1 of the Statistical Appendix.

6.13 The railway still operates in a highly restricted operational and commercial environment. As Figure VI.1 suggests, railway links to Turkey and Azerbaijan remain closed because of the blockade. International traffic is only possible to Georgia and its Black Sea ports of Poti and Batumi. There is no direct railway link between Armenia and Iran. In the past, some railway freight and passenger transport was possible to and from Iran through the Azeri province of Nakhichevan. That transport route has remained closed since the blockade started.

6.14 The branch line linking Ghumri to Ahurian at the border with Turkey leads to a terminal to change the wheels and bogies of the wagons from the wider Armenian gauge to the narrower, standard Turkish gauge. This facility has a capacity of about 150 wagons/day. Because of the blockade, no trains operate on this branch and the terminal is closed.

6.15 The branch line looping around Lake Sevan and going to Vaderniz and Zod, where it terminates, is only used by one customer, ArmZoloto, a gold mine company whose mines are located there. There are several other branch lines connecting factories to the main railway network. Most of these industrial lines are not owned by the Armenian Railways, and some of the bigger factories have their own shunting locomotives, drivers and co-drivers.

6.16 Given the topography of the country (high altitude, mountainous terrain), the track often crosses very difficult terrain with sharp bends and steep gradients. In some sections, curves have a radius of only 150m. About 70 percent of the network is located at an altitude of 1,000m or higher, and 40 percent at more than 1,500m. The continental climate of Armenia, with cold winters, large temperature differentials throughout the year, and rain and snow cause weakening of the slopes, landslides and rail corrosion.

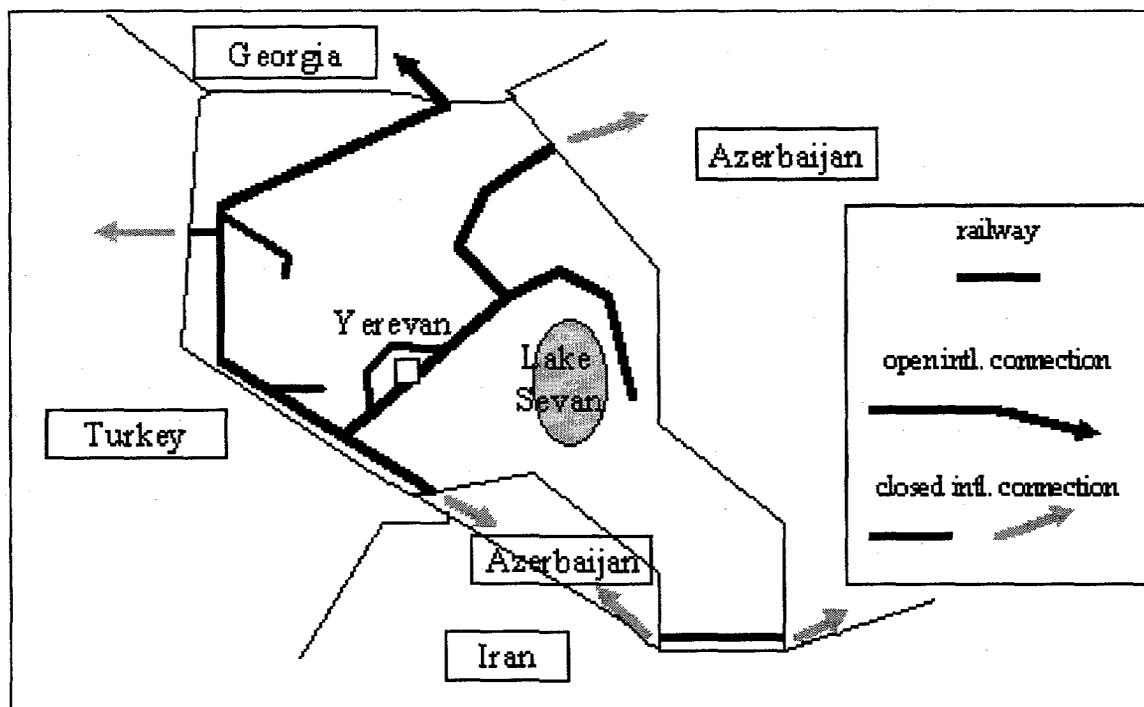


Figure VI. 1 Diagram of the Armenian Railways Network

6.17 The rolling stock of the Armenian Railways was supplied from the erstwhile Soviet system, which purchased its requirements not only within the FSU but from suppliers elsewhere in the Council for Mutual Economic Assistance (CMEA) and even in Western Europe and Japan. Little of this non-CMEA equipment, however, was passed on to Armenia. Today, the main traction equipment consists of 95 VL-8 and VL-10 electric locomotives (57 of which need repair), 119 2M62 and TSHME diesel locomotives, mainly used for shunting (72 not operational) and 22 self propelled electric units that are permanently coupled to coaches in local passenger service. In addition, there are 330 passenger coaches (of which 184 need repairs) and about 5,240 freight wagons (2,650 needing repair). Only about 1,280 of the freight wagons are in Armenia<sup>13</sup>.

<sup>13</sup> Many freight wagons belonging to the Armenian Railways are in other CIS countries, mostly in Russia. Given current significant rolling stock problems throughout the CIS, the Armenian Railways will most probably recover only a small fraction of its wagons in acceptable technical conditions. The 1,280 wagons located in Armenia include 478 enclosed cars, 196 platform cars, 360 cars with boarded shutter, 30 cisterns and 216 other.

6.18 The Armenian Railways also own significant areas of land as well as numerous real estate assets. Nevertheless, the company has only limited authority to manage its real estate properties. Under current legislation, for instance, the railways are not allowed to make any commercial use of their land.

### C. Traffic Levels

6.19 The collapse of the FSU, political instability and economic blockade, combined with the poor condition of the railways characterized by financial difficulties, lagging maintenance and problematic availability of spare parts (see Railway Operations below) contributed to a drastic decline of railway traffic, both for passenger and freight.

6.20 **Freight Traffic.** In 1989, over 5.12 billion ton.km moved by rail in Armenia. By 1994, total ton.km had dropped to 0.38 billion ton.km, or about 7.4 percent of 1989 levels. In 1995, and for the first time since the beginning of traffic decline in 1989, cargo output in ton.km started increasing, reaching 0.40 billion ton.km. This recovery, however, seems fragile: based on actual statistics for the first 9 months of 1996, total freight traffic for 1996 is estimated to decrease again by about 15 percent to 0.35 billion ton.km (see Figure VI.2). Railway freight traffic has now clearly lost its past predominant role in relation to road transport.



Figure VI. 2

Sources: Armenian Railways and Ministry of Transport

6.21 Statistics on the origin and destination of freight traffic are not being collected by the Armenian Railways on a regular and reliable basis. Also, given that until 1992 the Armenian railway network was operating as part of the massive FSU railway network, no differentiation was made between domestic (within Armenia) and international traffic (with other FSU republics and countries outside the FSU). The only available traffic statistics provide information on cargo loading and unloading, which is also presented in Figure VI.2. Total loadings in 1995 were at 832 thousand tons or 5 percent of 1989 levels while unloadings amounted to 1,370 thousand tons, or again about 5 percent of 1989 levels. Preliminary 1996 data indicates total loading and unloading traffic would further decrease to 1,725 thousand tons, or 20 percent less than in 1995, despite overall economic recovery in Armenia.

6.22 The only international freight route that remains open today is to and from Georgia, and is mainly active due to WFP traffic. One to two trains per day cross the border and make the trip to Yerevan. Domestic demand for railway freight shipments as well as traffic on industrial branch lines (see para. 6.15) plunged with economic decline.

6.23 Freight traffic patterns started changing as early as in 1988, when a devastating earthquake partially paralyzed road and railway transport, and in 1989 when international aid started flowing, mostly by rail, to the devastated areas. The gap between cargo loadings and unloadings, traditionally in favor of the latter because of Armenia's role of net importer during Soviet times, further increased after 1988 with humanitarian assistance.

6.24 The most important traffic components in recent years were liquid fuel (mainly heating oil and gasoline), cereals (grain, flour) and construction materials –traffic that is indispensable for maintaining energy, food supplies and key infrastructure for the country. About one fifth of this traffic was humanitarian aid from different organizations, including the World Food Program (see para. 6.53). Most other goods that were traditionally transported by rail before Independence (including iron, steel and other metal and copper products) have practically disappeared from railway cargo statistics. Indeed, many domestic industries that used to ship or receive cargo by rail from other FSU republics and now need to transport considerably reduced amounts of goods over much shorter distances, have turned to road transport, some of them even deserting their own railway branch lines that used to link them to the rest of the Armenian Railways network.

6.25 Average travel distance for freight was also altered by the changing political and economic environment. It increased from 120 km before Independence to about 180 km in 1995 and an estimated 200 km in 1996, reflecting the change in type of commodities transported, with critical imports and international humanitarian cargo accounting for much of the traffic. It is also a consequence of the new rail and road competition climate as Armenia moves towards a market-oriented economy with a fully liberalized private trucking industry. Short distance cargo is increasingly being transported by trucks (for high value cargoes or over short distances, road transport is faster, cheaper and more flexible and reliable than any other transport mode), while the

railways remain somewhat more attractive for long distance transport, although they keep losing traffic in general terms.

6.26 The current relative competitiveness of the railways over road transport on long distance routes is partly circumstantial and artificial because of: (i) the difficulty of obtaining gasoline and diesel in the country; (ii) the sharp increase in fuel prices, which are now at international levels; and (iii) the fact that, despite a recent and encouraging tariff restructuring, railway freight tariffs still remain below cost-recovery levels (see Section F below). All of these factors have been favorable to the railways.

6.27 **Freight Traffic Forecasts.** Cargo transportation by rail has proven to be and still is a key element in the transport system of Armenia, especially to ensure humanitarian cargo movements from Georgia and/or when diesel for trucks was difficult to obtain. However, with economic and regional stabilization, the importance of the railways as a key element in freight transport in Armenia is likely to diminish further. The railways have already lost their past predominant role to road transport, and the future of railway freight traffic will now very much depend on competition between rail and road transport, in a context of completion of the privatization of the trucking industry, implementation of cost-recovery measures for the railways and improved availability of fuel. Competitiveness of the railways for freight transport in Armenia still needs to be demonstrated, even for long distance traffic, as suggested by the further decline of freight traffic observed so far in 1996.

6.28 In Western countries, rail cargo transportation becomes competitive for distances exceeding several hundred kilometers (typically, 400 to 500 km in Europe, depending on the type of freight), although there are some goods and bulk raw materials which remain captive to rail transport regardless of distance.

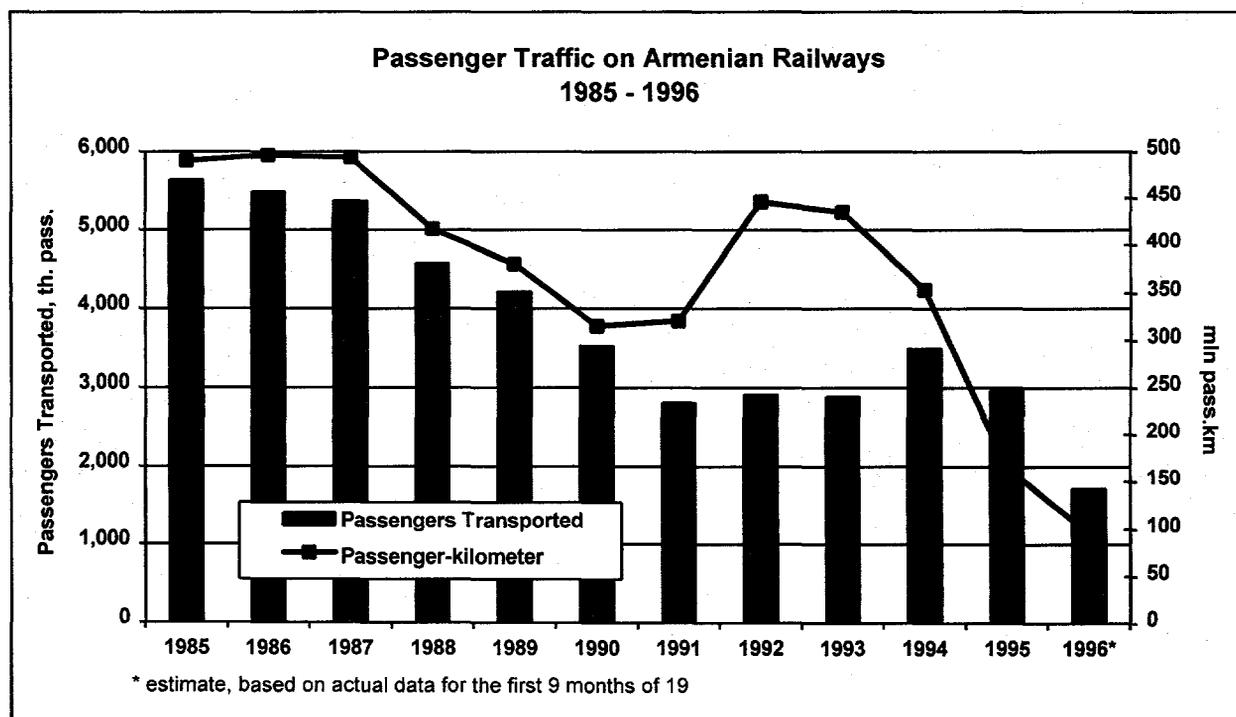
6.29 Once humanitarian cargo traffic phases out with economic recovery, and given the geographic dimensions of Armenia, the Armenian Railways will need to carefully market their services and target international and even transit freight transport –whenever possible-- in order to survive competition. If, for instance, the border with Turkey is reopened, the potential for rail transport to and from Turkey and even Europe could be substantial, as current excess transit costs (650 km of road transit between Yerevan and Poti), and also transshipment costs in Poti and destination ports would be avoided. This potential, however, would not be realized unless technical capacity of the railways is enhanced, and issues relating to security problems and inefficient customs and border procedures are properly addressed. Other transit routes to and from Iran and Azerbaijan, if opened, do not promise remarkable traffic.

6.30 In an effort to prepare themselves to the difficult times ahead, and in coordination with EU-TACIS Eurail consultants, the Armenian Railways developed a business plan earlier this year. According to this plan, freight traffic would progressively recover to about 1992 levels by 2004. These projections also take into account the reappearance of some transit traffic starting in 1997. While these projections are not unrealistic, they remain, in light of the discussion above,

relatively optimistic. Also, any significant transit traffic by rail would only take place under the *peace in Transcaucasia* scenario (see Chapter III).

6.31 More conservative projections, in line with the *border-opening* scenario, would indicate a slight increase in loading and unloading traffic starting in 1997, to 1,925 thousand tons by 2003, or about 1994 levels. However, reflecting the new pattern of long distance traffic demand for rail transport, total tonnage transported is estimated to recover somewhat faster to about 1,925 million ton.km, or more than what was transported in 1992. Armenia will not reach 1989 or 1990 levels of railway traffic for a very long time (see Chapter III).

6.32 **Passenger Traffic.** Passenger traffic was also deeply affected by the harsh economic and geopolitical situation in Armenia. The total number of passengers transported by rail in 1995 was slightly below 3.0 million, while they were about 4.2 million in 1989 and 5.6 million in 1985. In terms of passenger-kilometers, the decline is even bigger: 165 million pass.km were transported by the railways in 1995, down from 380 million in 1989 and 490 million in 1985, although a rebound was recorded in 1991-1993, mainly because of diesel shortages affecting road transport. Passenger traffic further decreased during the first 9 months of 1996, and 1996 estimates now put the number of passengers transported at 1.7 million or 43 percent less than in 1995 (see Figure VI.3 below).



**Figure VI. 3** Sources: Armenian Railways and Ministry of Transport

6.33 Railway passenger traffic has been particularly vulnerable to regional instability and border crossing closures. Before 1989, when problems started, about 35 percent of railway

passenger traffic was long distance, most of it on international routes. In 1989, the passenger lines Yerevan-Kapan and Yerevan-Baku (Azerbaijan) were closed. In 1992, passenger traffic was interrupted on all rail routes to Russia (Yerevan-Moscow, Yerevan Rostov, Yerevan-Novosibirsk and Yerevan-Sochi). In 1994, the only remaining international passenger route (Yerevan-Tbilisi, Georgia) was also closed. Since then, the Armenian Railways have only been able to operate relatively short-distance service on selected domestic and suburban routes, hence the sharper traffic decline in terms of passenger-kilometer.

6.34 Only about 10 domestic or suburban routes were still open in 1995. Domestic routes included Yerevan-Airoum, Yerevan-Vardenis and Yerevan-Ghumri. Open suburban routes were mostly around Yerevan and included Yerevan-Artashat, Yerevan-Ararat, Yerevan-Yeraskh, Hrazdan-Arabkir, Yerevan-Araks, Ghumri-Pemzashen and Kirovkan-Airoum. During the winter of 1996, however, because of frequent power blackouts and collapse of passenger demand, some of these routes were temporarily closed.

6.35 Today, 40 to 50 percent of the remaining railway passenger traffic consists of so-called *privileged* passengers who ride at reduced fares or even free of charge. The concept of *privileged* passengers dates back to the Soviet period, and relates to a long list of categories of passengers who enjoy travel at discounted fares. Categories entitled to free of charge travel include Parliament and local and municipality representatives, civil servants of the Parliament or local municipalities, veterans, blind people, persons accompanying the above, primary and secondary grade students living in rural areas, anti-fascist fighters, and employees of the Armenian Railways. Students of higher grades, disabled workers, groups of pupils, working teenagers up to 18, parents and wives of soldiers who died, and some other categories enjoy 50 percent discounts on already low fares.

6.36 Because of budget constraints, the Government stopped subsidizing the Armenian Railways to compensate for *privileged* passenger transport. Current full fares for passenger transport by rail are far from covering all costs incurred anyway. The continuation of passenger service is therefore creating enormous financial strains on the railways (see Section F below). Furthermore, the railway passenger traffic decline is very likely to continue because of competition from road transport, which is even stronger for short travel distances. Such competition is already taking place, although it is largely distorted in favor of the railways because of their low tariffs. Armenian Railways officials are very much aware of the passenger transport situation and are advocating the termination of all railway passenger transport services in the country. The Ministry of Transport as well as Government officials, however, are reluctant to authorize such a closure as the continuation of railway passenger transport is considered as an important social service. *This is a misguided concept. Subsidies, if justified and fully funded, should be given to the demand rather than the supply side.*

6.37 As a step in the right direction, the Government recently proposed to eliminate *privileged* transport by January 1, 1997, and replace the old discounted fare system by direct subsidies for those in need. However, the question of future passenger traffic by rail remains

unresolved, and although a careful study would need to fully evaluate its potential, the option of terminating it should be seriously considered.

6.38 **Passenger Traffic Forecasts.** Under the *border opening* scenario, railway passenger service would be progressively eliminated until it is completely closed down in 1998 (see Chapter III).

#### D. Railway Operations

6.39 **Track and Railway Infrastructure.** The overall condition of railway infrastructure varies very much depending on sections considered. An estimated 200 km of tracks would need to be reconstructed, while 70 km need repair. On main lines where rails lay on concrete sleepers, the situation is acceptable. In some places, a nut is missing and is difficult to replace because of lack of spare parts, but the overall fixing of the rail still remains strong enough. As nuts tend to unscrew, inspection for re-tightening of nuts is essential.

6.40 On sections equipped with wooden sleepers, the situation is critical. Most wooden sleepers are rotting away and in many cases, nails are halfway out. Also, wooden sleepers often are poorly bedded in the ballast. Several estimates indicate that about 400,000 wooden sleepers need urgent replacement. In 1994 and 1995, the World Food Program (see para. 6.53 for a detailed description of WFP's assistance to the railways) was able to procure 15,000 wooden sleepers as well as sleeper laying machines and other small track machinery for the Armenian Railways.

6.41 The condition of the rails is not much better: on many sections rails are worn down and in critical condition. Small pockets on top of rails are appearing and each time a wheel passes, more fragments of steel are torn off, thus increasing the size of the pocket and the risk of derailment. Furthermore, in mountainous sections and tight curves, the profile of rails on the inside of the curves has almost disappeared, and the risk of derailment, even at low speeds, is very high. Maintenance of shunting yards is also poor. Rails, switches and ballast there need repair although such maintenance is given lower priority because safety problems are less serious near terminals where trains and locomotives circulate at lower speeds.

6.42 Equipment needed for rail infrastructure repairs is not available in Armenia and needs to be imported. Track units currently utilized by the railways are 20 years old on average, and the last significant capital investments for track equipment were made in the mid-1970s. The railways are lacking rails, switches, sleepers, bolts and nuts to carry out even basic maintenance. Emergency repairs are only possible through the dismantling of lines not used, which represent a source of spare parts, and much of that work is performed manually.

6.43 **Rolling Stock.** During Soviet times, all rolling stock repairs were performed at several repair plants, mainly in Russia, under the Ministry of Roads and Communication of the USSR. There were no rolling stock repair units in Armenia. Because of the transportation

blockade and lack of funds, the Armenian Railways have not been able to carry out any maintenance for the past 6 to 7 years. As indicated in para. 6.17, more than 60 percent of electric and diesel locomotives, and more than 50 percent of passenger coaches and freight wagons need to be repaired. Despite poor rolling stock maintenance, however, given current low traffic levels, the Armenian Railways are still able to operate scheduled trains. While the urgency of some repairs depends on traffic recovery, operation of even current traffic will be hampered if lack of spare parts continues for much longer.

6.44 The Armenian Railways now plan to repair their electric traction equipment at the Ghumri electric locomotive depot, the freight wagons at the Ghumri wagon depot and the passenger wagons at the third depot, the Yerevan wagon depot. Operations at the two depots located in Ghumri, however, are hardly possible as one of the depots was partially destroyed by the 1988 earthquake and the construction of the other one is not complete yet. The Yerevan depot is in better condition and operations are carried out whenever funds and spares (sometimes from cannibalizing of other rolling stock) are available.

6.45 **Electric Infrastructure and Power Supply.** The situation regarding electric infrastructure seems more satisfactory. There are 3 electric supply stations in Ghumri, Yerevan and Razdan which are in relatively good working condition, but again lack of spare parts, in particular copper wire, is making operations more and more difficult. The wires of the catenary system were replaced in 1982, and these usually last for up to 30 years. However, poor maintenance of the pantographs of the electric locomotives is causing excess wear of the wires, and lack of spares is becoming critical.

6.46 Because of the power shortage in Armenia, power supply to the railways is unstable. Blackouts are common and average supply of 1,800 to 2,000 V instead of the 3,000 V required by the electric locomotives hampers operations considerably. In some cases, several locomotives -- instead of only one under normal conditions-- need to be used to pull trains through mountainous areas or to pull heavily loaded freight trains. The poor reliability of appropriate power supply directly affects operational safety and increases maintenance costs for rolling stock, signals and other electrical equipment. In addition, electricity to the catenary, which is given priority, is supplied through a different circuit than to buildings hosting signal and communication equipment. As a result, in many cases, although electric locomotives can work, signals do not operate.

6.47 **Information Technology.** The signalization and telecommunication systems are in poor condition. The network is fully equipped with an automatic block system, but it is currently not operational and in most cases trains depart from stations on written notice (permissions). The 1988 earthquake badly damaged most of the communications equipment, and the buildings housing the signalization, block system and telecommunication centers were partially destroyed. Within weeks after the earthquake, damaged equipment was repaired on an emergency basis and, as a temporary solution, telecommunication centers were set up in wagons. Because of lack of funds for new equipment, these arrangements are still in place today.

6.48 In addition, communications between stations were not available until recently. In order to ascertain smooth operations for the transportation of humanitarian aid to Armenia, the UN World Food Program (WFP) provided 3 radio communication stations to the Armenian Railways in 1994 (see para 6.53). These were installed in Yerevan, Ghumri and Airum.

6.49 Information technology at headquarters is also at very low levels. No accounting, payroll, inventory or any other administrative functions are computerized. The same could be said about individual staff productivity tools, as there are very few personal computers and most employees must rely on paper and pencil.

6.50 **Movement of Trains.** Poor rail condition, loosening of sleepers and overall lack of maintenance have significantly reduced the maximum speeds at which trains can circulate on the Armenian Railways network. In some mountainous sections, speed is now limited to only 15 km/h. This situation also generates technical problems with many locomotives that are used under their critical speed of 20 km/h for prolonged periods of time. Adding to the difficulties, manual switching and lack of reliable communication equipment has made progress through stations very slow. Also, freight wagons cannot be loaded to full capacity as poor track maintenance imposes weight restrictions on many sections. Maximum weight of trains from Georgia, for instance, is now less than 1,900 tons.

6.51 **Investments.** In 1995, the Armenian Railways was only able to spend 103 million dram (about US\$250,000, or one-fourth of the price of a diesel locomotive) for capital investments. No capital expenditures were scheduled for 1996. In its business plan (see para. 6.30), the railways estimate that about US\$ 40 million would be needed between 1996 and 2000 to achieve the necessary rehabilitation of the network. Although this amount includes expenditures for rehabilitation of equipment for passenger service, whose continuation should be put into question (see paras. 6.36 and 6.37), it corroborates EU-TACIS (Eurail consultants report) cost estimates for minimum and urgent rehabilitation to keep the railways alive over that period.

6.52 Based on existing reports and a review of Armenian Railways investment needs over the next 7 years, a detailed investment plan for the 1997-2003 time period was elaborated (see Annex 2 on the plan itself and section F below for its financial implications). The proposed plan examines the railways' minimal survival needs depending on whether it keeps electric traction or chooses to use diesel traction only. At expected traffic levels, diesel traction is most cost effective and deserves careful examination (see para. 6.65 below). Under this traction scenario, the proposed investment plan would amount to slightly more than US\$75 million, of which about 60 percent would be spent on track maintenance and rehabilitation, 28 percent on rolling stock, 6 percent on rolling stock maintenance depots, and 6 percent on communication and information technology. Given current traffic levels and regional stability prospects, no long term investments dealing with new construction should be undertaken. However, some investments might be needed to rehabilitate the branch line to Turkey if the border reopens.

6.53 **World Food Program Assistance.** The Armenian Railways are significantly benefiting—both financially and operationally—from the United Nations World Food Program, and more specifically from the work of its Caucasus Logistics Advisory Unit (CLAU). The latter has representatives in Yerevan, Tbilisi, and Baku. Through its primary concern for movement of humanitarian assistance shipments, WFP/CLAU is having a substantial positive impact on the operation of the railway system by its continuous and obviously very professional, “hands-on” diagnoses of operational shortcomings.

6.54 Between 1994 and 1995, to add force to its diagnoses, WFP has made grants totaling over US\$7 million to the Caucasus region, of which about US\$1.1 million was earmarked for Armenia. These funds enabled, among others, the purchase of 4 second-hand 2T-10M diesel locomotives, the procurement of 15,000 wooden sleepers, a sleeper-laying machine and other small track machinery, locomotive accumulators as well as the provision and setting up of a HF radio communication network for the Armenian Railways. The 1996-1997 railway grant program would amount to an additional US\$3.5 million for the three Caucasus republics.

6.55 WFP/CLAU was able to reduce turn around times significantly for wagons transporting humanitarian aid in the three Caucasus republics, and to speed up border crossings significantly by rail between Armenia and Georgia by laying down joint procedures between custom officials on both sides. Last but not least, WFP/CLAU issues periodic “Situation Reports” analyzing the logistical situation in the Caucasus, and specifically the situation in the railways and on the ports (in Georgia). These situation reports have become a very valuable source of information on transport in the Caucasus.

#### **E. Legal Framework of Labor Relations**

6.56 Labor relations in Armenia are governed by the old Soviet labor code and a law on Employment which was passed in 1992. The 1992 law guarantees to the employees the right to form and join trade unions of their choice, without any previous authorization. The law also specifies that negotiations with the employers are carried out by trade unions. Such negotiations lead to the signing of a contract by both sides and form the basis for collective agreements that regulate the terms and conditions under which labor is provided, including payments for social services, medical care, accidents, safety and sanitary arrangements, and representation of the trade union to the management of the enterprises. There is no obligation, however, to draft written contracts between employers and their workers, and in practice, such contracts do not exist.

6.57 The Armenian Railways have an independent trade union, the Armenian Railways Trade Union. Almost 100 percent of railway employees are members of this Union. Both the Armenian Railways and its Trade Union have signed collective agreements as stipulated by the 1992 Employment law. According to these, all decisions regarding the “liquidation, reorganization or alterations of forms of property enterprises and railway transport organizations and subdivisions” are made with the participation of the Trade Union.

## F. Financial Issues and the Need for Restructuring

6.58 The Armenian Railways are supposed to operate as an independent entity and no longer receive any subsidies from the State budget to cover their operating expenses. In theory, they are also free to set tariffs, although they are bound by international (CIS) agreements for international traffic, are required to provide discount-fare passenger service (see para. 6.35) without any kind of budgetary compensation, and need to request Ministry of Transport and Government clearance every time they want to change tariffs for traffic inside the country. The clearance procedure is usually very long and final approval is not guaranteed. Also, most railway freight operations are government-driven services to government or State-owned bodies at less than cost-recovery tariffs. This governmental interference in many Armenian Railways' activities prevents the company from effectively operating as an independent entity in an emerging commercial environment.

6.59 The accounting system is on an accrual basis<sup>14</sup> and separates Armenian Railways' activities into three different categories: passenger traffic, freight traffic and non-transport operations (see paras. 6.7 and 6.8). The accounts show a very poor cash-flow situation. Since 1993, transport operations (passenger and freight service) have been running a modest deficit which has been covered by Government subsidies (before they were removed) and profit from non-transport operations. Despite current depressed traffic levels and the accumulation of delayed critical maintenance, the railways accounts still indicate small "profits". In 1995, these amounted to 13 mln dram (or about US\$30,000) before taxes.

6.60 Assets. These "profits", however, are explained by largely undervalued assets (today, net assets are valued at about US\$13.8 mln, i.e., about the purchase price of a dozen locomotives), insufficient depreciation provisions and cash-management of maintenance, which, because of financial constraints, is carried out only when there are funds available rather than on the basis of a maintenance plan. In real terms, the Armenian Railways are living off their asset base, which is eroding at a very fast pace. Even if all "profits" were allocated to the rehabilitation of the asset base, its erosion would not be stopped. The amount of the shortfall is estimated at more than US\$10 million for 1996. Also, the current situation is making the railways pay more profit taxes than they would if assets were re-valued and proper depreciation charges applied.

6.61 Working Capital. Despite its small "profit", the Armenian Railways also have difficulty in paying their bills. Payables, mainly to the State (55 percent) and the power company, amounted to about US\$4.5 million in 1995, or more than 6 months of expenses. This situation partly results from current tax legislation in Armenia, which is particularly adverse to the Railways<sup>15</sup>, and the fact that although it was understood since 1993 that humanitarian cargo would

<sup>14</sup> i.e., revenues and expenditures are reported at the time of billing, as opposed to cash-basis accounts, where revenues and expenditures are reported at the time of payment.

<sup>15</sup> Tax legislation in Armenia requires all enterprises to pay VAT within 90 days of billing, regardless of whether the payment for the services provided was actually received by the enterprise or not. The Railways transport significant amounts of raw materials, and are usually not paid for that service until these are manufactured

be VAT exempt, the Government did not approve related legislation until 1996 and is therefore asking the Railways to pay all VAT arrears on humanitarian cargo for the 1993-1996 period.

6.62 The situation regarding receivables is not any better. About 70 percent of the US\$3.6 million in receivables at the end of 1995 --the equivalent of 5 months of railways' billings-- were from State-owned companies and parent Ministries, the remaining 30 percent being private sector arrears. The major railway debtor is ArmZoloto, the State gold mining company, which currently owes US\$1.6 million to the railways. ArmZoloto has serious financial difficulties and because of its arrears, the railways have temporarily suspended their services on the Razdan-Zod line (see para. 6.15), although at the cost of conflicts with the Ministry of Transport.

6.63 Revenues. Most of the revenues of the railways come from freight operations (part of which is humanitarian assistance transport), where the average tariff was 1.9 UScent/ton.km in 1995. In 1996, freight tariffs were slightly increased to 2.0 UScent/ton.km, regardless of freight type. When based on proper depreciation provisions, current freight tariffs do not reach full cost-recovery. The situation is worse for passenger transport, where the average tariff of only 0.19 UScent/pass.km in 1995 (*privileged* passengers included --see para. 6.35) was very far from covering all the costs of the services provided. Full-fare passenger tariffs were also increased in 1996, from 0.36 to 0.52 UScent/pass.km on average, but even these remain too low.

6.64 Costs. The Armenian Railways' poor cost efficiency represents a heavy burden on its finances. Maintenance costs are likely to keep increasing as the backlog of maintenance accumulates and infrastructure and rolling stock gets older. Additionally, many railway lines are kept open despite very low utilization. This is the case of the Razdan-Zod line which remained operational in 1995 despite traffic levels of only about 50,000 tons generated by the only customer of the route, the gold mining company ArmZoloto (see paras. 6.15 and 6.62). Another example is the Kuiboshevo line, which was damaged during the 1988 earthquake and where no traffic is circulating today. On these two lines, despite very low or even non-existent utilization, station workers are not laid off, energy is consumed and communication and track units remain operational with the standard number of staff. In many other cases, station, track, energy and communication units are kept in working order despite low traffic levels in order to avoid violence and prevent theft and disintegration of infrastructure.

6.65 The railways' cost structure is also affected by current practices of favoring electrical traction to diesel traction. While electrical traction was fully justified when the Armenian Railways had significant traffic or when diesel fuel was difficult to obtain, it appears today as less efficient than a diesel-only system. Indeed, electric traction implies power supply over the entire railway infrastructure, a significant waste of resources given current line utilization levels. Diesel locomotives are also more flexible and cost-efficient than electric locomotives for low and relatively short-distance traffic. Last but not least, the railways fully depends on the Arshalvis

---

and eventually sold by their customer. Given current economic difficulties in the country, the delay in that payment, if ever made, very often exceeds the 90-day period after billing, in which case the Railways have then to bear the corresponding VAT payable and ensuing penalties.

nuclear power station for their power supply, a situation which does not favor reliability of operations if the railways continue the almost exclusive use of electric locomotives. The World Food Program's recent purchase of 4 diesel locomotives to ensure proper humanitarian aid transport between Georgia and Armenia (see para. 6.54) was also partially motivated by the problematic over-reliance of the railways on electric traction. A careful study on the diesel versus electric traction issue would be necessary as a basis for making a decision regarding future operations. In all paragraphs and projections below, however, the diesel traction scenario was adopted (see Annex 2 for details on the investment plan under the electric traction scenario).

6.66 Outlook. Today and despite recent restructuring efforts, including staff reduction (see section A) and moderate tariff increases, the railways do not have any debt nor investment capacity. Like many other FSU railway companies, the Armenian Railways are facing a situation where radical changes are inevitable. The most critical issue is to transform the railways into a truly independent, commercially viable entity, subject to market forces. There is almost no hope that the company's revenues and business in general will recover significantly during the coming decade without a major restructuring. Therefore, a reasonable railway reform program, based on an agreement between the Armenian Government and the Armenian Railways is urgently needed. Such an agreement would set the grounds to restructure the company, plan emergency investments and achieve the optimal cost structure and operational level to ensure the survival of the railway industry in Armenia.

6.67 Failure to implement significant financial adjustments and restructuring would put the railways in a very difficult position. They would be able, through cannibalization of unused rolling stock and infrastructure, to maintain current operating levels for another few years with no significant losses other than non-compensated depreciation of assets. After this period of time, there would still be no funds for rolling stock renewal or track infrastructure rehabilitation. The Armenian Railways would then be forced to decrease service levels progressively and to close down routes, until complete disruption of the system.

6.68 Financial Adjustment and Restructuring. An indicative financial adjustment and restructuring plan, along with related financial projections<sup>16</sup> (see Tables VI.1 and VI.2 below and Tables 6.3 to 6.6, Statistical Appendix) was elaborated on the basis of Armenian Railways' current financial information. The plan provides an outline of the actions needed for the railways to generate enough debt and investment capacity to carry out a minimal, survival-based investment plan as described in para. 6.52 (total investment of more than US\$75 million for 1997-2003), under the diesel-traction assumption. The investment program could be achieved through generation of internal funds and limited debt (US\$10 million in 1998). The restructuring plan would also avoid further de-capitalization of the railways through improved operating and financial practices (notably proper depreciation provisioning).

---

<sup>16</sup> Financial projections were prepared in 1995 US\$. Company accounts have been restated to approximate International Accounting Standards (IAS) and have been converted from Armenian Drams into US\$ for easier comparability. See Table II.1, Chapter II, for exchange rate information.

6.69 The plan is built on demand projections under the border-opening scenario (see Chapter III), as described in section C. Passenger transport activities would stop by 1998 and until there is significant demand for that service at tariffs covering all the costs of the services provided, the Armenian Railways would remain a freight-only transport mode.

**Table VI.1** Armenian Railways - Summary Income Statement Projections  
(1995 US\$ mln, unless otherwise indicated)

	1995*	1996	1997	1998	1999	2000	2001	2002	2003
<b>Traffic</b>									
Passenger (mln. pass.)	2.97	1.72	0.86	-	-	-	-	-	-
Passenger.km (mln pass.km)	165	95	48	-	-	-	-	-	-
Freight (mln. ton)	2.20	1.73	1.74	1.76	1.78	1.81	1.85	1.89	1.92
Freight in ton.km (mln ton.km)	403	345	348	343	347	353	351	358	366
<b>Tariffs</b>									
Avg. Pass. Tariff (USc/pass.km)	0.19	0.28	3.00	-	-	-	-	-	-
Avg. Freight Tariff (USc/ton.km)	1.90	2.00	5.00	6.00	6.75	7.00	7.25	7.50	7.50
Armenian Railways Staff	6,647	6,647	5,324	4,000	3,000	3,000	3,000	3,000	3,000
Operating Revenues	7.95	7.16	18.85	20.59	23.39	24.74	25.47	26.88	27.41
Operating Expenses	8.42	9.87	11.78	10.63	10.48	10.04	10.87	11.88	13.05
Depreciation	0.26	8.69	8.69	8.86	9.76	10.22	10.75	11.34	11.93
Net Profit After Tax	0.02	(11.16)	(1.62)	0.77	1.51	2.58	2.27	2.28	1.56
<b>Ratios</b>									
(Expenses+Depr.) / Revenues	109%	259%	109%	95%	86%	82%	85%	86%	91%
Net Profit as % of Revenues	0.3%	-155.8%	-8.6%	3.7%	6.5%	10.4%	8.9%	8.5%	5.7%

\* Actual, 1995

6.70 Five specific areas would be addressed by the proposed financial adjustment and restructuring. These include: (i) asset revaluation; (ii) tariff adjustment; (iii) staff reduction and salary increases; (iv) a cost-reduction program; and (v) an arrears repayment program exploring possible offsetting mechanisms.

(i) *Asset Revaluation.* Armenian Railways' fixed assets are largely undervalued (see para. 6.60). A detailed railway-specific asset revaluation, made by qualified auditors, is needed. This revaluation would take into account all assets in working condition, and all other assets being written off the accounts and eventually used as a source of spare parts<sup>17</sup> or even auctioned. The average remaining life of the re-valued assets, along with the corresponding average depreciation rate, would then be assessed and revised as necessary. Preliminary

<sup>17</sup> even though the prolonged use of older equipment does not make operations profitable nor efficient.

estimates would re-value net fixed assets to more than US\$110 million, to be fully depreciated over 20 years.

(ii) *Tariff Adjustment.* Recent tariff increase efforts would need to continue and be reviewed in order to cover the cost of the services provided and generate enough funds to finance all necessary maintenance and rehabilitation. Preliminary estimates indicate that during the phasing-out of passenger transport operations in 1997, current average passenger revenues of about 0.28 UScent/pass.km would need to increase to about 3.0 UScent/pass.km. Freight tariffs would also need to increase from current 2.0 UScent/km to 6.0 UScent/ton.km by 1998 and between 7.0 and 7.5 UScent/ton.km after 2000. Such tariff increases would most certainly affect the structure of railway freight demand and somewhat decrease the competitiveness of the railways against road transport, although restructuring and privatization of the latter would also force truckers to adjust their tariffs to cover costs. Relevant marketing and commercial policies would need to be implemented accordingly (see para. 6.71).

(iii) *Staff Reduction and Salary Increase.* The Armenian Railways appear over-staffed given current traffic levels (see section A). A progressive reduction in the number of employees from 6,650 to about 3,000 people is recommended<sup>18</sup>. Staff reduction would be compensated by severance payments of up to 2 years of salary. These severance payments, representing an estimated US\$3.6 million over 3 years, are financially feasible and have been included in the financial projections. Such payments would also give employees incentives to consider leaving the entity and would increase the number of voluntary departures. At the same time, in order to retain qualified human resources, and contingent on labor productivity improvements, salaries would need to increase, by about 20 percent per year. These increases are in line with the country's policy of moving towards a market economy and in emphasizing work remuneration rather than social contribution. Last but not least, the railways are in need for at least three to four young managers with Western economic and/or finance education. Urgent employment of such a team with high compensation, in accordance with the salary increase policy, is also recommended.

(iv) *Cost-reduction Program.* The cost-reduction program would consist of an analysis and rationalization of the railways cost structure, divestiture of any non-railway-related activity (see section A) and sale or auction of unused or unnecessary assets. Private companies should also be allowed to operate activities that may or may not be directly linked with railway operations, and/or joint-ventures for these activities should be established. Specific actions would include closure of the Kuiboshevo line; the sale or rental of the Razdan-Zod line to its only customer, ArmZoloto; similar sales or rentals on many branch-lines used by a limited number of customers; and a rationalization of the number of shops and depots on the network, according to traffic levels and rolling stock turnover.

<sup>18</sup> The Ministry of Transport has indicated its preference for a smaller and slower staff reduction program, which would bring Armenian Railways' staff size to about 4,300 people over three years (reduction of 1,000 employees in 1997, 700 in 1998 and 600 in 1999). The extra-costs of this alternative option amount to reducing the railways' debt capacity by more than US\$10 million.

(v) *Arrears Repayment Program.* Most overdue payables and receivables of the railways come from the same source: the State. Offsetting mechanisms whereby tax payables could be offset by State-owned entity receivables or through the creation of a railway-arrears clearinghouse would substantially reduce the enormous liquidity difficulties of the Armenian Railways. Following the implementation of this program, the financial projections assume that by 2003 accounts payable would be brought down to slightly more than two months of expenditures while accounts receivable would represent about a month and a half of billings.

6.71 The proposed restructuring plan implies financial and managerial independence for the railways as well as greater financial transparency between the different departments of Armenian Railways. Each department of the railways should operate as a cost and profit center. In addition, financial adjustment and restructuring should be implemented along with a commercial development plan.

**Table VI.2** Armenian Railways - Summary Balance Sheet Projections (1995 US\$ mln)

	1995*	1996	1997	1998	1999	2000	2001	2002	2003
<b>Total Assets</b>	<b>18.95</b>	<b>115.97</b>	<b>112.98</b>	<b>122.39</b>	<b>121.33</b>	<b>121.45</b>	<b>121.67</b>	<b>121.97</b>	<b>121.59</b>
Fixed Assets	13.82	111.66	106.21	115.36	114.80	115.33	116.23	116.74	116.31
Current Assets & Long-Term Inv.	5.13	4.31	6.77	7.03	6.52	6.11	5.44	5.22	5.28
<b>Total Equity and Liabilities</b>	<b>18.95</b>	<b>115.97</b>	<b>112.98</b>	<b>122.39</b>	<b>121.33</b>	<b>121.45</b>	<b>121.67</b>	<b>121.97</b>	<b>121.59</b>
Equity and Reserves	14.43	109.70	108.08	108.85	110.36	112.94	115.21	117.49	119.05
Long-Term Debt	0.00	0.00	0.00	10.00	8.00	6.00	4.00	2.00	0.00
Current Liabilities	4.52	6.27	4.91	3.54	2.97	2.51	2.46	2.48	2.54
<b>Ratios</b>									
Current Assets/Current Liabilities	1.14	0.69	1.38	1.98	2.20	2.44	2.21	2.11	2.08
Days of Payables	193	174	150	120	102	90	81	75	70

\* Actual, 1995

6.72 Figure VI.4 below pictures how the cost structure of the Armenian Railways would be affected by the proposed restructuring plan.

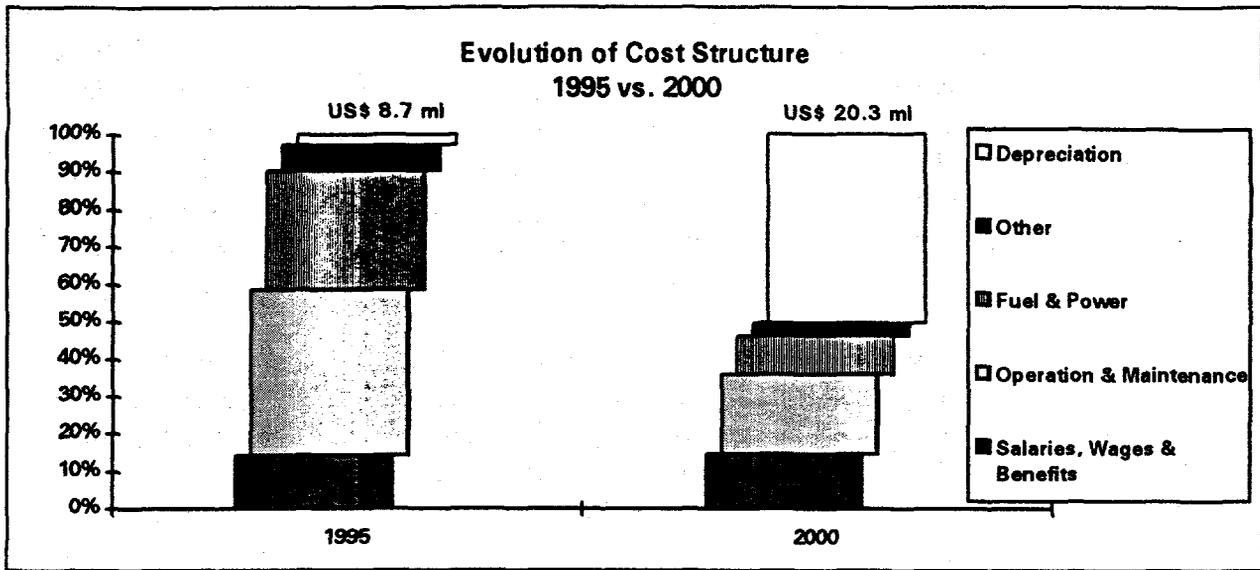


Figure VI. 4

## VII. CIVIL AVIATION

### A. Overview

7.1 Under the FSU, all air transport operations were centralized under one organization --Aeroflot. Aeroflot was based and managed from Moscow, and was exclusively responsible for providing public air services, managing airports and Air Traffic Control (ATC) while acting simultaneously as a regulatory body. Daily management of operations was delegated to regional departments.

7.2 Passenger air transportation was one of the most heavily subsidized services in the FSU, more under-priced even than bread, vegetables or automobile fuel. Operating costs and the cost of producing aircraft were artificially low because of low fuel and raw material prices, other cheap inputs, and subsidies. After taking into account exchange rate and purchasing power differences, in 1989, the price of a 800 km air trip from Moscow appeared as 43 percent of a trip of similar length from Brussels or 49 percent from Chicago. An important share of leisure traffic was also stimulated by allowances granted by the State-owned employers to their staff for annual vacations.

7.3 With the breakdown of the FSU, Aeroflot was broken into national entities. Management functions and investment funding that used to be undertaken from Moscow were transferred to entities that were not structured accordingly. Armenian Airlines was Aeroflot's successor in Armenia, inheriting part of its physical assets as well as its operating and institutional structure. Some structural changes have been initiated in order to better separate regulatory functions from operational activities (Yerevan Zvartnots Airport, Armenian Airlines). Yet, the rate of institutional reform and related implementation is still very low. This situation may endanger the achievement of the ultimate objective of setting up the aviation sector on a market-driven basis as suscribed by the authorities (see Section B, Institutional Organization).

7.4 Air transport is crucial for trade development in Armenia since it is a landlocked country and is currently moving towards new markets while maintaining its historical trade links with other CIS countries. The importance of aviation in the economy of Armenia has been fully proven during the last decade after the 1988 earthquake and during the blockade of the 1990s, when the country was isolated from the rest of the world and in a poor economic position.

7.5 During these turbulent years, as reflected by traffic statistics (see Figures VII.1 and VII.2 below), Armenia was heavily relying on air transport to maintain its access to key commodities and goods. Air cargo and passenger transport were artificially boosted --freight traffic (and in particular short-distance cargo) because there were no alternative means of transportation, and passenger traffic because international trade procedures were completely disrupted and the only way to import or export was for Armenians to travel abroad themselves to

accompany their own goods. Since 1994, however, with economic recovery and easing of regional tensions, total passenger and cargo air traffic demand has decreased. The declining trend is likely to continue until the split between air transport and other modes of transportation is established on the basis of comparative costs as its dynamic rational.

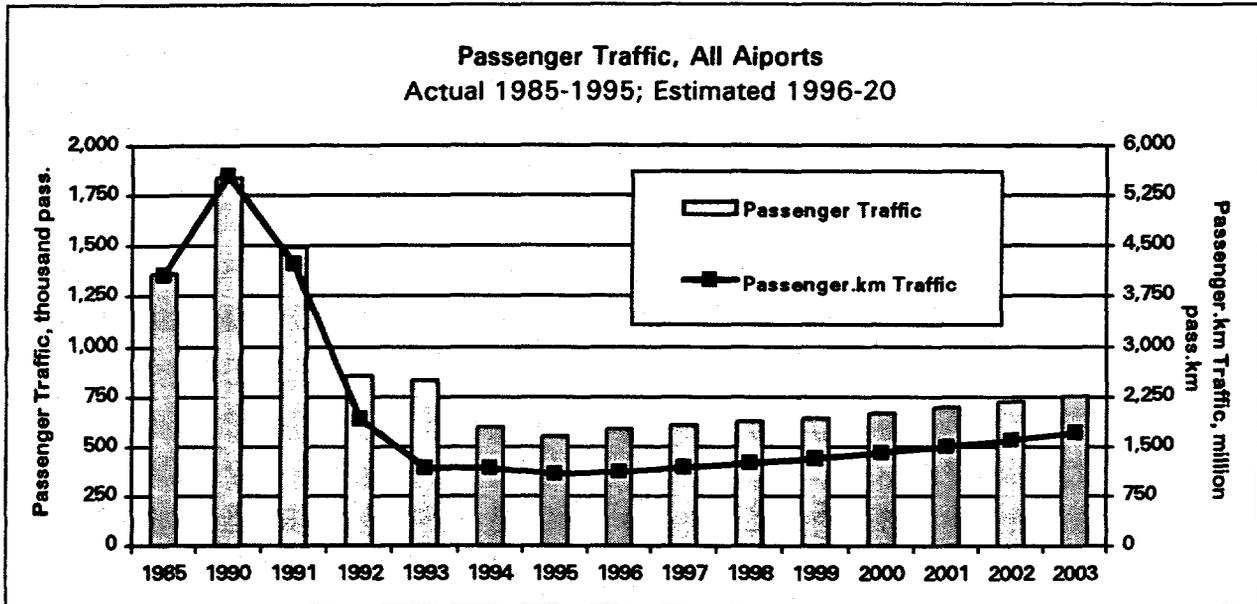


Figure VII. 1 Sources: Zvartnots Airport and State Department of Statistics

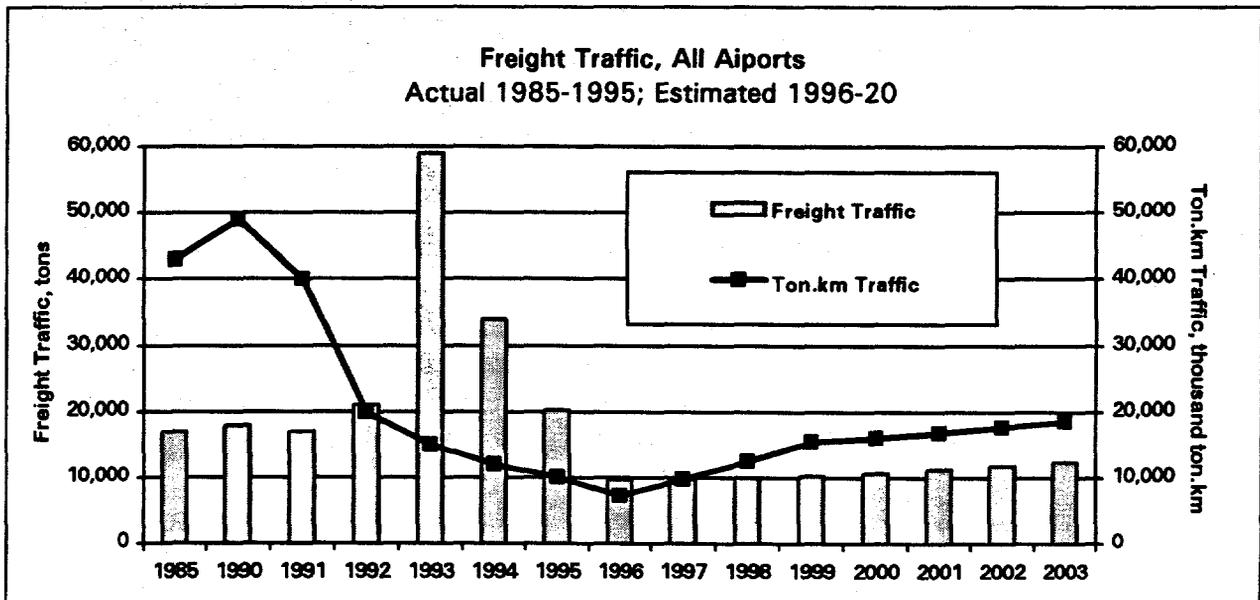


Figure VII. 2 Sources: Zvartnots Airport and State Department of Statistics

7.6 Estimates for 1996, based on actual data for the first 9 months of the year, indicate that air freight traffic has not bottomed yet, further decreasing by about 50 percent. Passenger traffic, however, is resuming growth (about 6.6 percent), ending a declining trend initiated in 1989. In light of world averages for similar statistics, and once market mechanisms stabilize the transport modal split, air cargo and passenger traffic could increase at about real GDP growth rates. This was assumed in traffic projections above, under the border-opening scenario (see Chapter III).

7.7 Today, Armenia is connected by air to eight Western European and three Middle-Eastern countries, and to a significant number of CIS cities (almost 30), mainly in Russia. All of these flights are operated by Armenian Airlines alone. Practically all of the 13 CIS routes operated by Armenian Airlines are in competition with other CIS airlines. Surprisingly, no Western European airline operates to Yerevan although this destination represents today a market of more than 30,000 passengers per year, not including the probably high percentage of connecting passengers on Aeroflot routes via Moscow.

7.8 While the Armenian Government claims it is willing to open its skies, foreign carriers seem to be deterred by technical difficulties linked to aircraft handling, a point that is subject to debate, and restrictive traffic rights imposed by the Armenian side. The disruption in 1995 of charter services between Paris and Yerevan, after an apparently successful attempt carried out by the French charter company ACI, illustrates the difficulties encountered by Western European airlines in Armenia. Current de facto Armenian policy on this issue seems mainly aimed at protecting the national airline.

7.9 The impact on the economy and the economic costs of continuing the status quo needs to be re-examined. The main issue lies in the evaluation of the role to be played by the national airline as well as its capacity to make the transition from the "command and control" system to a market system, in competition with international carriers, in order to provide an acceptable air transport system which promotes trade and development within the constraints of the country's scarce resources.

## **B. Institutional Organization of the Sub-Sector**

7.10 The former geographic department of Aeroflot was transformed into the General Department of Civil Aviation (GDCA) of Armenia in March 1993, upon the adoption of the Charter of the GDCA. The Charter separates regulatory and operating functions by creating several "Special purpose State enterprises", namely : Armenian Airlines, Zvartnots airport and Erebuni and Shirak airports. The terminology "enterprise", however, is misleading since all of these entities are still run as state departments rather than as enterprises per se. For instance,

their directors report to the General Director of the GDCA like any other sub-division of this authority.

7.11           **General Department of Civil Aviation.** Its status is governed by the Charter previously mentioned, and a 1996 amendment to it. Except for the structure of enterprise management (see above), its chart is in line with ICAO procedures, making of GDCA the representative of Armenian Government responsibilities on the international scene. Armenia joined ICAO as early as 1992, has already signed bilateral agreements with more than 10 countries, and is in the process of signing with an additional 10, including major markets in Western Europe. *These agreements, however, are based on shared capacity and may therefore not help new entries.* In addition, by early 1997, Armenia will most likely become the first CIS country to be admitted by the European Civil Aviation Conference (ECAC), a forum of more than 30 Member States and whose main goal is to harmonize aviation regulations within Europe.

7.12           Presently, with 85 employees, GDCA appears over-staffed by about 30 percent, in light of the global activity of the sub-sector. Moreover, remuneration of GDCA civil servants is about 10 times less than that of personnel from the newly created state enterprises in the sub-sector, of equivalent education and qualification. Accordingly, the most qualified personnel are moving away from GDCA. This situation may lead to a distortion in the organization of the whole sub-sector, while lack of budget endangers its future efficiency. Training in English, the international language of aviation, is much needed.

7.13           **Airlines.** Armenian Airlines, with its two daughter companies (Ararat Airlines and Ghumri Airlines), is the dominant air operator in Armenia. However, two private enterprises have been created since 1991 : Arax Airways for passenger transport, and Yerevan Airways for cargo. Each of the latter only operate one aircraft, on a charter basis.

7.14           The main institutional issue is the airlines' lack of managerial independence from the Government. Their statutes, adopted in 1995, still maintain the organic link with the Head of the GDCA, who "enjoys the exclusive right on the management of the enterprise and on final solution of any matter of its activities". This situation is contradictory with the original goal of effectively separating regulatory functions from operational activities and responsibilities. Armenian Airlines is included in the list of state enterprises to be privatized, although there is no privatization schedule for it yet.

7.15           **Airports and ATC.** Armenia is equipped with three major airports : (Zvartnots, the main international gate in Yerevan, Erebuni-Yerevan city airport, and Shirak airport) and with some other smaller paved airfields at Goris, Sisian, and Kapan, although none of the latter are used by airlines anymore.

7.16 Zvartnots was set up as a "Special Purpose State Enterprise" in 1993. Zvartnots airport kept control of all Air Traffic Control (ATC) activities over the whole territory of Armenia. This structure, which still prevails today, is not viable operationally because it dilutes responsibilities. In addition, lack of precision in the cost accounting of ATC within overall Zvartnots airport activities prevents the evaluation of the real cost of ATC and from providing a cost-based justification for the level of navigation and landing fees (see section F). Indeed, these have been set more on standard world averages rather than on actual costs incurred, ignoring international requirements that charges should reflect the cost of the service provided.

7.17 A dangerous distortion introduced by the current structure is that revenues from ATC can be used for other projects (such as the future air cargo terminal building -- see below, sections D and F) rather than for the needed renewal and upgrading of navigation aids equipment. More transparency is compulsory to attract international financing, and the best structure would be based on an autonomous ATC entity, separated from the airport.

7.18 Today, Zvartnots airport has 1,810 employees, including controllers, a figure that is also quite oversized, taking into account the fact that handling is not performed by the airport itself but shared between Armenian Airlines and a newly created private company, "Aviaservice". Zvartnots should evolve towards a real private or semi-private structure, meaning that its board of directors may include representatives of the Ministry of Transport and/or GDCA in order to ensure that it is fulfilling the country's general economic objective and interest, but should also include representatives from local entrepreneurs, and local or governmental authorities involved in national trade development.

7.19 Erebuni airport, built in the 1930s, was the first airport of Yerevan. It is also in charge of maintenance of all other runways of Armenia. Yet, when Zvartnots was created, Erebuni remained in operation although its activities were not economically justified any longer. Even today, Zvartnots is far from congestion. Keeping Erebuni open therefore means excess capacity and extra maintenance costs. Its closure to civil aviation activities should be considered, along with the transfer of supervision of other Armenian airports to Zvartnots. Today, Erebuni employs 51 people.

7.20 Shirak airport, in the Northern part of the country, is still sized for FSU traffic levels. Today, it employs 440 people for a traffic of about 1,040 movements and 48,311 passengers per year. Yet it is only within a two hour drive from Zvartnots, and the need to keep another international airport of this size, with a 3,200 meter runway, is also questionable. Possibilities to downsize it to a regional airport should be analyzed.

### C. Airline Operations

7.21 **Traffic and Network.** Armenian Airlines is far from the almost 3 million passengers it used to transport before 1990. During the first years after the FSU break-up and mainly because of the blockade imposed on Armenia, the national airline benefited from a quasi-monopolistic position in Yerevan. In 1995, it carried 428,000 passengers, of which 33,000 traveled on Western routes and 284,000 to CIS countries, the route of Moscow representing a significant share (167,000 passengers) – see Table 7.6 of the Statistical Appendix for more details on Armenian Airlines' network. Armenian Airlines still is the only operator on its 8 Western routes, although it is facing fierce competition from other CIS airlines on CIS routes (see Tables 7.7 to 7.9, Statistical Appendix). This competition explains most of the 17 percent passenger traffic decline suffered by Armenian Airlines between 1994 and 1995 (3 percent of which is explained by the decrease in total air traffic as described in para. 7.5). Overall, Armenian Airlines' market share for passenger transport to and from Yerevan has been slowly eroding over the past few years (see Tables 7.1 to 7.3, Statistical Appendix and Figure VII.3 below). Passenger traffic in 1996 confirmed this trend: 358,000 passengers traveled with Armenian Airlines during the year, or 16 percent less than in 1995.

7.22 On its Western network, Armenian Airlines has embarked on a route-diversity strategy (7 destinations served, although only once a week). However, taking into account that 40 percent of its market is in fact connecting traffic to and from North America, where an important Armenian Diaspora is settled, the alternative strategy of selecting only one specific gateway, supported by a solid alliance with the dominant carrier of that gate (code sharing, commercial support, etc.), not only for transcontinental routes but also for other European destinations, may merit close examination.

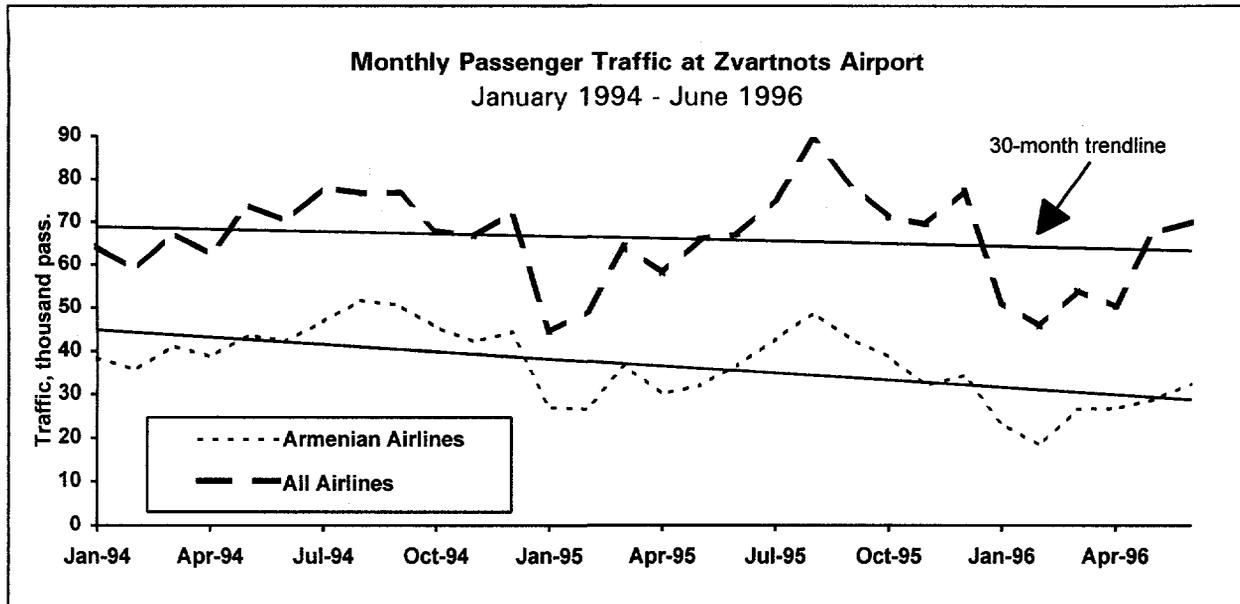


Figure VII. 3 Source: Zvartnots Airport and Armenian Airlines

7.23 Armenian Airlines is still sized very much according to former traffic levels, with almost 2,000 employees (including staff of subsidiaries). Table 7.4 of the Statistical Appendix provides a detailed organizational chart of the airline. Some staff adjustment has already taken place, but further staff reduction of about 950 employees would be needed. In particular, efficiency could be increased through the relocation of Armenian Airlines' subsidiary Ararat Airlines from Erebuni to Zvartnots.

7.24 **Fleet.** The Armenian Airlines commercial transport fleet consists of 30 Soviet-manufactured aircraft (see Table 7.5, Statistical Appendix). Except 3 large body Ilyushin Il-86 (340 seats), one of the most recent soviet aircraft, the fleet includes mostly middle-range narrow bodies: 10 Tupolev Tu-154 (160 seats), 8 Tu-134A (76 seats), and 9 Yakovlev Yak-40 (27 seats). In fact, several of these aircraft are not in operating condition anymore, either because of maintenance disruption or because they remain registered although they have gone beyond their life cycle. As a result, the active fleet consists of an estimated 22 aircraft.

7.25 The current network of Armenian Airlines represents less than 20,000 flying hours per year, or around 900 hours per aircraft, which is not unusual in CIS countries, but far less than the productivity of Western airlines (from 2,500 to 3,000 flying hours per year for aircraft similar to Tu-154 or Tu-134, and even more for aircraft similar to Il-86). Armenian Airlines' network could be easily flown by only 10 soviet built aircraft, including using one of each type as a back-up. Even less aircraft would be needed if these were Western-built (around 7).

7.26 Armenian Airlines' fleet is getting old and obsolete, and its operating costs are higher than those of Western airliners. Fuel consumption is at least 50 percent higher than that of Western aircraft of the same generation, and twice as high as aircraft of the new generation. Operating such aircraft requires cockpit crews of three to four people when only two is now common for Western aircraft. Maintenance costs are also higher: even though spare parts can be obtained at low prices, insufficient supply and improper maintenance procedures cause longer ground time. Additionally, engine maintenance design is not modularized, which leads to full engine replacements at a much higher frequency than on Western aircraft.

7.27 Most aircraft are reaching the end of their life cycle. Tu-154's average age exceeds 18 years and Tu-134's 23 years. The problem of their replacement is all the more urgent as these aircraft belong to Chapter 2 of ICAO classification and therefore do not comply with the forthcoming US and EU noise reduction regulations, which will gradually ban such aircraft from access to airports (Chapter 2 aircraft over 25 years of age have not been allowed to operate to Europe since 1995, and all of them, whatever their age, will be banned after 2002). Consequently, in order to remain on the international scene, Armenian Airlines' priority is to acquire sufficient financing capacity (see section F below) to purchase or lease new generation aircraft in order to have access to and be competitive in Western markets.

7.28 Armenian Airlines has already tried to acquire two B757s (210 seats) under a lease agreement, but this attempt was unsuccessful because of lack of financing guarantees. It is now contemplating the acquisition of smaller aircraft (150 seaters such as B737-400 or A320) but the financing guarantee difficulties still remain. Yet if the airline is intending to compete on the high yield contribution market segment, with a large business class, it may wish to consider slightly bigger aircraft allowing a more comfortable configuration for its medium range routes (average flight time to Europe is almost 5 hours), while offering increased capacity for belly cargo.

7.29 **Investment Needs.** Armenian Airlines should dispose of its unproductive assets. As stated before, a fleet of ten aircraft should be sufficient to serve its current network, including the re-opening of some former routes if needed. The fleet would include two Il-86, three Tu-154, three Tu-134 and one or two acquisitions of new generation, 150 to 200 seater aircraft that are necessary to serve Western markets by the end of the century. However, new generation aircraft does not mean new ones, and attention should be paid to the current availability of second-hand/Chapter 3 aircraft, with a significantly lower acquisition or leasing price. The recent acquisition by Aeroflot of six second-hand A310s in order to extend its current fleet of five A310s (which were bought brand new), illustrates how Aeroflot's investment policies are now shifting to a more economic approach. Such policies could be followed by other CIS airlines. The selection of aircraft type should also be based on cargo capabilities in light of the relevance of the cargo market for a land-locked country.

7.30 Other investment needs include technical assistance in the commercial field and the development of a management information system, including cost accounting. In all, this investment program would amount to about US\$80 to 120 million by the end of the decade, an estimate that would have to be refined according to a business plan currently under elaboration. Without structural and financial adjustments, such an investment program is out of reach (see section F. Financial Issues).

#### D. Airport Infrastructure and Facilities

7.31 **Infrastructure.** Currently, only Yerevan Zvartnots, Yerevan Erebuni, and Shirak airports are open to commercial operations. This airport network represents excess capacity and extra maintenance costs (see Section B). *An Airport National Masterplan would be necessary to define priorities and ensure consistency in terms of airport investments.* In the short term, however, emphasis should be given to Yerevan Zvartnots Airport, Armenia's main gateway. Runways and major infrastructures are generally in good condition including for approach navigation equipment (see section E on ATC). Issues mainly relate to passenger and cargo terminal buildings.

7.32 The passenger terminal building, designed in FSU times when traffic was almost exclusively to and from the Soviet Union, is not suited to the new needs for international traffic treatment. Furthermore, its structure made of concrete makes difficult any refurbishing and space reorganization to meet the need for international traffic flow separation. Passenger baggage delivery in the terminal is also completely outdated, leading to extensive delays. Some projects for the creation of a small international terminal building or for the extension of the existing terminal are under consideration, for a cost of US\$3 to 5 million. Yet, taking into account current airport commitments with its new cargo terminal (see below), it is very unlikely that it will have the financial capability to undertake such extensions. In fact, the main issue at Zvartnots is more of a managerial and organizational nature, and many facilitation procedures in line with ICAO guidelines could be implemented at a rather low cost. Training in English and orienting management towards commercial airport operations would represent the most important and effective investments.

7.33 A new cargo terminal building is currently being erected in order to replace by the end of 1997 the old cargo terminal, which has become completely obsolete and, in any case, not compatible with the role that air cargo does or may play in Armenia. The planned capacity of the new terminal (80,000 tons), however, appears ambitious in light of current traffic volumes (40,000 tons in 1995) and decreasing trends (about half of 1995 traffic expected for 1996, see para. 7.6). This capacity was elaborated in 1992, when traffic was reaching exceptional peaks because of the blockade. Furthermore, the potential profitability of the new terminal was based on projections assuming a significant fare increase, from US\$6 to 200 per ton. An even sharper

fare increase, to about US\$250 per ton, might actually be needed (see Section F). Such fares, although in line with international levels, may have an important negative impact on air cargo traffic if they proved to be not competitive with those of other modes of transportation.

7.34 Total cost of the new terminal is estimated at US\$27.8 million, of which US\$22.8 million is financed by an EBRD loan, including a significant technical assistance program. The project represents a heavy commitment for the airport, preventing it from launching other urgent, although minor, investments (such as passenger terminal improvement projects). This situation further emphasizes the need for Zvartnots to develop an important marketing program, attracting as many foreign carriers as possible to increase airport revenues. At the same time, and in line with possible conditionalities of the EBRD loan, any feasible cost reduction in the original cargo terminal project should be looked for and any available financing re-allocated to other needed investments.

7.35 Other projects under consideration in relation to the airport include the construction of a four star, 100 bed hotel on its site, and possibly of another one in the city. Whatever the profitability of these projects, the airport should first focus on its main aviation role. Its involvement in such a different profession should remain very limited, the sole objective of which should be raising revenues through rentals. The construction of a maintenance hangar is also under consideration. Here again, although it is very important for Zvartnots-based airlines to have the possibility of maintaining their aircraft in a closed building rather than outdoors as is done today, such a project should be more the choice and the responsibility of the airlines than of the airport.

7.36 **Facilities.** Today, handling is performed by Armenian Airlines and by a private company, Avia service. However, handling equipment remains insufficient for both passenger and freight, and this represents a significant constraint for trade development. The airport needs to provide some basic services and facilities that, due to current traffic levels, would not be cost-effective if carried out separately by individual carriers. Alternatively, these services could be bid internationally. However, when and if requested by new entrants, passenger self-handling should be allowed, as this activity can be fully included in an airline's marketing strategy (image, product, and quality of service).

7.37 Because of the role the airport may play in the national economy, and the need for Armenia to have an efficient air gateway, it has to evolve as much as possible towards a market-driven entity with the objective of promoting air traffic to, from and through Armenia. Landing charges should be computed to reflect costs while revenues from concessions should be sought (such as duty-free, car rental, parking, hotels, etc.). A business plan aiming at providing the airport with commercial management, even if it remains a State enterprise, should also be elaborated and implemented.

7.38 **Investment needs.** Urgent investments should include: (a) passenger terminal refurbishing and acquisition of handling equipment; and (b) technical assistance for passenger activities in order to help airport management introduce commercial practices. About US\$5 million should be sufficient, in the short-term, to finance the refurbishing, equipment and technical assistance required.

### E. Air Traffic Control (ATC)

7.39 Aircraft movements amount to about 60 over-flights per day, and around as many movements arriving at or departing from Armenia. En-route fees are similar to those in the rest of the world (these have actually been set on the basis of international standards rather than to reflect real incurred costs – see para. 7.16), while approach fees are included in airport landing fees.

7.40 ATC is still under the umbrella of Zvartnots Airport. Because of the airport's important capital needs to finance its other investment programs (see above section D), cash-flows generated by ATC are diverted from their original objective of reinvesting in ATC equipment. Such practices seem to explain why the former project of separating ATC from the airport is being delayed. Moreover, expenses related to ATC are not included in the computation of ATC taxable benefits, leading to the absurd situation where 30 percent of ATC revenues go to taxes rather than to an ATC depreciation account (see section F below).

7.41 It is recommended that all ATC activities be set up under an independent commercial entity. Such an entity should regroup both en-route and approach air traffic control, in order to ensure better coordination in terms of daily operations as well as technical consistency of investments. ATC investment needs mainly consist of equipment upgrading, representing an estimated US\$3 to 4 million.

### F. Financial Issues and the Need to Restructure

7.42 **Armenian Airlines.** Armenian Airlines is free to set its tariffs, does not receive any subsidy from the State budget to cover its operating expenses and since April, 1996, is VAT exempt because of its status as the national airline. Its financial statements are on an accrual basis and 1995 accounts were recently audited by a Western auditing company. The audit was requested by Armenian Airlines to support its efforts to find bank guarantees for the leasing of aircraft. The auditors recommended several adjustments to the balance sheets and income statements, some of which were implemented by the airline in 1996.

7.43 Income statements showed a modest profit (US\$230,000) for a turnover of about US\$46 million in 1995. Profits in 1996 were significantly higher (US\$5 million, with a US\$60 million turnover), following tariff increases for passengers and cargo. These profits, however, remain artificial: despite a recent revaluation of Armenian Airlines' assets (see Table 7.5, Statistical Appendix), provisions for depreciation and future fleet renewal appear too low. Accordingly, Armenian Airlines is paying more profit taxes than it should.

7.44 Assets. Assets were re-valued in 1995 and again in 1996, following adjustments as suggested by the auditors. Assets acquired after 1993 were re-valued as a function of the variation of the Dram with respect to the dollar, whereas acquisitions prior to 1993 were re-valued by setting the company's return on net assets at 5 percent. Balance sheets for 1996, after all revisions, value gross assets at almost US\$60 million while net assets amount to only US\$15 million (as a reference, a brand new B727 costs about US\$60 to 70 million, new generation Tupolevs cost about US\$20 million, while second-hand Tu-134 average US\$5 million). With current depreciation rules, this asset valuation does not enable the accumulation of sufficient provisions for depreciation or fleet renewal, and still generates unfounded profit tax payments. *If depreciation and minimal reserves for fleet renewal had been properly provisioned, Armenian Airlines' statements would have shown a loss estimated at US\$5 to 6 million in 1995, and only a relatively small profit in 1996.*

7.45 Revenues. Armenian Airlines fares are typically based on inter-airline agreements and officially follow IATA guidelines. On CIS destinations, however, fares depend on whether the passenger is a CIS citizen or not, non-CIS citizens usually paying significantly more (60 to 70 percent in most cases) than CIS passengers. This policy is followed by many CIS airlines, despite the fact that fare differentiation based upon nationality is contrary to international agreements and practices. For destinations in Central and Western Europe, although official fares are at IATA levels for all passengers regardless of nationality, most tickets are sold through tour operators at discounted rates (see Table 7.6, Statistical Appendix). Armenian citizens usually book their tickets through such tour operators.

7.46 Fares, especially within the CIS and for CIS citizens (the bulk of traffic on these destinations), seem too low when compared to international standards. For instance, a one way ticket from Yerevan to Moscow (1,795 km) is sold at about US\$110 to CIS citizens. This represents 6.2 USc/km, compared to an average of about 20 cents worldwide for similar distances and traffic flows. Average tariffs applied on Western destinations are more in line with international practices, although somewhat below IATA fares because of tour-operator ticketing. A tour operator fare for the 3,280 km one way trip to Amsterdam is US\$750 or 22.9 USc/km, compared to the 36.6 USc/km IATA tariff.

7.47 Costs. Armenian Airlines' fleet has poor cost efficiency (see paras. 7.26 and 7.27), representing a heavy burden on the finances of the airline. Aircraft maintenance costs are likely to keep increasing as the fleet gets older. The airline is also over-staffed (see para. 7.23).

7.48 Working Capital. Unlike other enterprises in the transport sector, Armenian Airlines' finances are not excessively affected by mounting arrears. Accounts receivable in 1995 and 1996 represented slightly more than a month of revenues, while accounts payable were at a month and a half of expenditures, a relatively reasonable figure in an industry where every ticket sold is considered as a payable until travel is completed by the passenger. *Lack of sufficient working capital, however, still remains an issue for the airline, which for instance carries out aircraft maintenance whenever funds are available rather than according to a pre-established maintenance plan*<sup>19</sup>.

7.49 Outlook. Despite recent restructuring efforts, including staff reductions, tariff increases and reevaluation of assets and other accounting adjustments as recommended by the auditors, the airline's debt or investment capacity is very limited. Fleet renewal or even aircraft leasing will remain impossible, as proven by the difficulties encountered by Armenian Airlines when trying to obtain bank guarantees (para. 7.28), unless further financial adjustments and restructuring are implemented urgently.

7.50 Failing to do so would put the airline in a very difficult position. It would be able, through cannibalization of unused aircraft, to maintain its current operating levels for another 4 or 5 years with no significant losses other than non-compensated depreciation of assets. After this period of time, when most of Armenian Airlines' aircraft would be banned on Western skies (para. 7.27), there would still be no funds for fleet renewal or aircraft leasing. Armenian Airlines would then be forced to decrease the numbers and frequency of flights, stop operating to Western destinations, and eventually lose significant market shares on all of its routes.

7.51 Financial Adjustment and Restructuring<sup>20</sup>. An indicative financial adjustment and restructuring plan, along with related financial projections<sup>21</sup> (see Tables VII.1 and VII.2 below and Tables 7.10 to 7.13, Statistical Appendix) was elaborated on the basis of Armenian Airlines' current financial information. The plan provides an outline of the actions needed *as a minimum* for the airline to generate enough cash-flow to lease two Western 150 to 200 seater aircraft by

---

<sup>19</sup> The current situation of maintenance is no stranger to the three engine failures on Armenian Airlines aircraft over the past six months.

<sup>20</sup> The basis of the financial restructuring strategy is similar to that of the railways (see para. 6.67), although adapted to Armenian Airlines.

<sup>21</sup> Financial projections were prepared in 1995 US\$. Company accounts have been restated to approximate International Accounting Standards (IAS) and have been converted from Armenian Drams into US\$ for easier comparability. See Table II.1, Chapter II, for exchange rate information.

1998, while avoiding further de-capitalization through improved operating and financial practices (notably proper depreciation provisioning). The yearly aircraft leasing expense was calculated as 12 percent of the purchase price of such aircraft (about US\$35 million per aircraft).

7.52 The plan is built on demand projections under the border-opening scenario (see Chapter III). Despite prospects of traffic recovery in the whole air sub-sector (see para. 7.6), Armenian Airlines demand is likely to continue to suffer from increased competition (see para. 7.21). Passenger traffic for 1997 would decrease by 5 percent, reach a low point in 1998 and start a modest 1 percent/year recovery thereafter. Passenger-kilometer traffic forecasts, however, are slightly more optimistic as average flight distances are likely to increase with the leasing of new planes and the implementation of commercial strategies on international routes (see para. 7.55). Similar assumptions were used for cargo demand forecasts.

**Table VII.1 Armenian Airlines - Summary Income Statement Projections**  
(1996 US\$ mln, unless otherwise indicated)

	1995*	1996*	1997	1998	1999	2000	2001	2002	2003
<b>Traffic</b>									
Passenger (th. pass.)	428	358	340	340	344	347	351	354	358
Passenger.km (mln pass.km)	849	747	723	738	760	783	807	831	856
Freight (th. ton)	7.4	5.4	5.1	5.1	5.2	5.3	5.3	5.4	5.4
Freight in ton.km (mln ton.km)	16.2	12.0	10.9	11.2	11.5	11.9	12.2	12.6	13.0
<b>Tariffs</b>									
Avg. pass. tariff (USc/pass.km)	4.59	6.50	6.80	7.40	7.60	7.60	7.60	7.60	7.75
Avg. freight tariff (USc/ton.km)	25.62	60.63	63.00	65.00	65.00	68.00	70.00	70.00	70.00
Armenian Airlines Staff	1,850	1,950	1,550	1,450	1,300	1,150	1,000	1,000	1,000
Operating Revenues	46.46	60.28	60.34	66.20	69.72	72.18	74.61	76.86	80.46
Operating Expenses	46.28	51.86	53.89	59.22	61.99	63.65	65.30	66.49	68.94
Depreciation	0.14	1.02	5.86	6.40	7.07	7.83	8.62	9.50	10.47
Net Profit After Tax	0.23	5.00	0.10	0.08	0.14	0.16	0.15	0.28	0.40
<b>Ratios</b>									
(Expenses+Depr.) / Revenues	100%	88%	99%	99%	99%	99%	99%	99%	99%
Net Profit as % of Revenues	0.5%	8.3%	0.2%	0.1%	0.2%	0.2%	0.2%	0.4%	0.5%

\* Actual, 1995 and 1996

7.53 Four specific areas would be addressed by the proposed financial adjustment and restructuring. These include: (i) asset revaluation and provisioning of depreciation; (ii) tariff adjustment; (iii) staff reduction and salary increases; and (iv) a cost-reduction program.

(i) *Asset Revaluation and Provisioning of Depreciation.* Armenian Airlines does not generate enough funds for depreciation and future fleet renewal, despite recent efforts to re-value assets and correct the problem (see para. 7.44). A detailed airline-specific asset revaluation, made by qualified auditors, is needed. Such revaluation would take into account all assets in working condition, all other assets being written off the accounts and eventually used as a source of spare parts<sup>22</sup> or auctioned. The average remaining life of the re-valued assets, along with the corresponding average depreciation rate, would then be assessed and revised as necessary. Preliminary estimates indicate that depreciation and fleet renewal provisioning would initially need to reach about US\$6 million per year for Armenian Airlines to maintain its current level of operations. This amounts to fully depreciate today's gross assets book value over about 10 years.

(ii) *Tariff Adjustment.* Recent tariff increase efforts would need to continue and be reviewed in order to cover the cost of the services provided and to generate enough funds to finance all necessary maintenance and rehabilitation investments as well as all aircraft leasing expenses. Preliminary estimates indicate that the current average passenger revenue of about 6.50 UScent/km would need to increase to between 7.60 and 7.75 UScent/km within the next 7 years. As already contemplated by Armenian Airlines, this adjustment could be achieved through the implementation of a flexible tariff policy including progressive fare increases, elimination of tariff discriminations between CIS and foreign citizens wherever possible<sup>23</sup>, modification of discount policies conceded to tour operators, and an increase in the share of seats sold at IATA fares. As for cargo tariffs, the current average freight revenue of 60 UScent/ton.km could be slightly increased to 70 UScent/ton.km, which is about the right level of expense coverage and more in line with international standards.

(iii) *Staff Reduction and Salary Increase.* Armenian Airlines is over-staffed at current and projected traffic levels (see para. 7.23). A progressive reduction in the number of employees of about 950 people is recommended and already envisaged by the airline. Staff reduction would be compensated by severance payments of up to 2 years of salary. These severance payments, representing an estimated US\$5 million over 5 years, are financially feasible and have been included in the financial projections. Such payments would also give employees incentives to consider leaving the entity and would increase the number of voluntary departures. At the same time, in order to retain qualified human resources, and contingent on labor productivity improvements, salaries would need to increase by about 15 percent per year. These increases are in line with the country's policy towards a market economy, emphasizing work remuneration rather than social contribution.

---

<sup>22</sup> even though the prolonged use of older equipment does not make operations profitable nor efficient.

<sup>23</sup> Unilateral elimination of such discriminatory practices could be counter-productive and affect Armenian Airlines competitiveness on routes served by other CIS airlines following similar policies.

(iv) *Cost-reduction Program.* Such a program would include an analysis and rationalization of the airline's cost structure, divestiture from any non-airport-related activity and sale or auction of unused or unnecessary assets. Private companies should also be allowed to operate activities that may or may not be directly linked with airline operations, and/or the establishment of joint-ventures for these activities should be explored.

7.54 The financial projections also take into account actions to improve billing and collection performance. Accounts payable would be brought down to about a month of expenditures while accounts receivable would represent less than a month of billings.

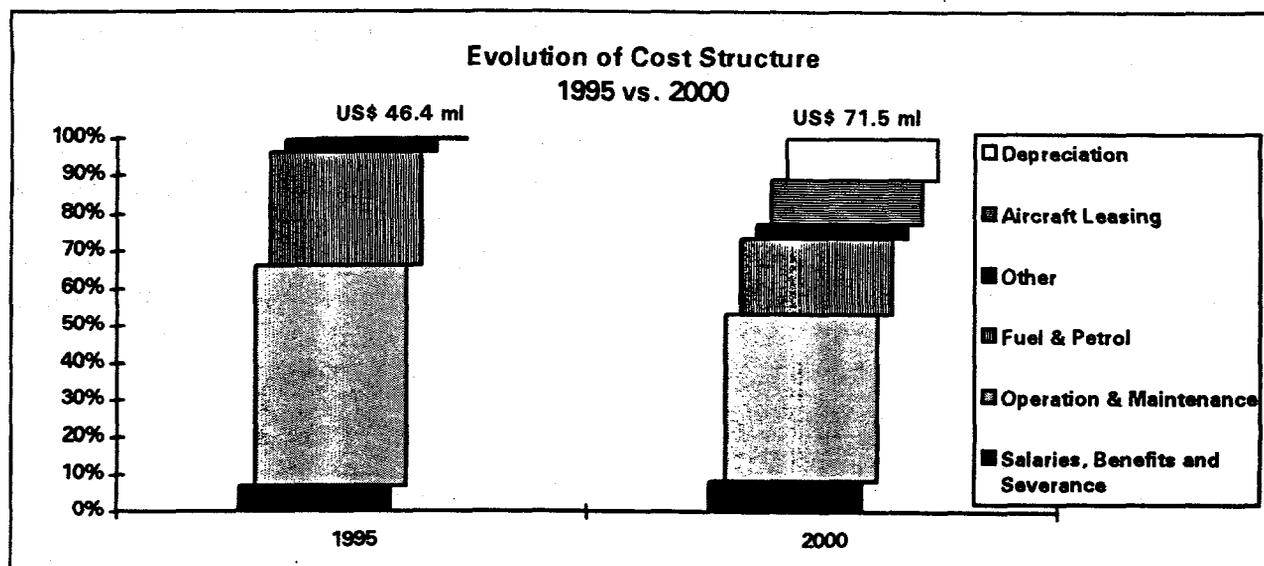
7.55 The proposed restructuring plan implies financial and managerial independence for the airline industry as well as more financial transparency between the different departments of Armenian Airlines. Each department of the airline should operate as a cost and profit center. Last but not least, financial adjustment and restructuring should be implemented along with a commercial development plan. Particular consideration should be given to potential benefits from a strategy shift in alliances with foreign carriers as suggested in para. 7.22, as well as to new commercial agreements further improving access to international computerized reservation systems and joint ventures.

**Table VII.2** Armenian Airlines - Summary Balance Sheet Projections (1996 US\$ mln)

	1995*	1996*	1997	1998	1999	2000	2001	2002	2003
<b>Total Assets</b>	<b>7.81</b>	<b>23.29</b>	<b>21.70</b>	<b>21.78</b>	<b>21.69</b>	<b>21.99</b>	<b>22.27</b>	<b>22.65</b>	<b>23.25</b>
Fixed Assets	3.05	14.64	14.18	14.53	15.06	15.12	15.25	15.45	15.78
Current Assets & Long-Term Inv.	4.77	8.66	7.52	7.24	6.64	6.86	7.02	7.19	7.47
<b>Total Equity and Liabilities</b>	<b>7.81</b>	<b>23.29</b>	<b>21.70</b>	<b>21.78</b>	<b>21.69</b>	<b>21.99</b>	<b>22.27</b>	<b>22.65</b>	<b>23.25</b>
Equity and Reserves	2.07	16.21	16.31	16.39	16.53	16.68	16.83	17.10	17.51
Long-Term Debt	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Current Liabilities	5.74	7.09	5.39	5.38	5.17	5.30	5.44	5.54	5.74
<b>Ratios</b>									
Current Assets/Current Liabilities	0.83	1.22	1.39	1.34	1.28	1.29	1.29	1.30	1.30
Days of Receivables	28	42	35	30	25	25	25	25	25

\* Actual, 1995 and 1996

7.56. Figure VII.4 below pictures how the cost structure of Armenian Airlines would be affected by the proposed restructuring plan.



**Figure VII. 4**

7.57 **Zvartnots Airport and Air Traffic Control (ATC).** ATC is an integral part of Zvartnots airport (see para. 7.40) and financial statements, which make it difficult if not impossible to estimate the financial situation of each activity separately. Zvartnots airport income statements show aggregated expenditures for both the airport and ATC, while revenues as shown in the same statements relate to airport activities only. ATC revenues only appear on Zvartnots' balance sheets (see para. 7.68 below). This lack of accounting transparency is undesirable especially at a time when the repayment of debt related to the construction the new cargo terminal (see paras. 7.33 and 7.34) is imposing severe constraints on Zvartnots' finances (see below).

7.58 **General Financial Issues.** Zvartnots airport is no exception to the recurrent financial difficulties transport entities face in Armenia today. Although 1995 accounts indicate a net "profit" of about US\$2 million for slightly more than US\$8 million in revenues, such profits are artificial and do not reflect the real financial situation of the airport. Total airport assets are largely underestimated, at about US\$1 million only, for a fully operational runway and several cargo and passenger terminal facilities. Accordingly, provisions for depreciation are excessively low. The airport's capital base is eroding at a fast pace, and even if all "profits" were allocated to asset rehabilitation, this decapitalization would not be stopped. The shortfall is roughly estimated at about US\$4 million. Also, the current situation is making the airport pay more profit taxes than it should if assets were properly valued and realistic depreciation charges applied.

7.59 Current airport revenues consist of cargo handling charges of about US\$6/ton, take-off charges of about US\$8.3/ton and a passenger tax of US\$4.8/passenger. Although these figures, except for the cargo handling charge (see discussion below), are only slightly below

world averages, the airport has difficulties in paying its bills. Accounts payable amounted to more than 100 days of total airport expenses in 1995.

7.60 Cargo Terminal Financing. Worsening an already relatively poor financial situation, the airport now has to meet substantial debt service requirements imposed by the new cargo terminal project. The US\$27.8 million project is financed by an EBRD loan (US\$22.8 million) and US\$5 million in local financing. The EBRD loan agreement was signed in November, 1994. According to the agreement, Zvartnots airport shall repay the EBRD tranche in 19 equal semi-annual installments, starting in March, 1998. The interest rate on the loan was set at LIBOR+1% (i.e., about 7 percent today). Conditions of reimbursement of the local tranche have not been agreed with the Government yet.

7.61 Main EBRD loan conditionalities include the following:

- the airport shall ensure that the outstanding balance on the account used for debt service, five days before each loan repayment, is at least one and a half times the next semi-annual debt service requirement.
- the revenues accumulated in the debt service account can be used only to (a) cover the operating expenses of the new cargo terminal and (b) repay the amounts under the loan agreement.
- no transfer of assets exceeding 10 percent of the total asset value may take place, unless EBRD agrees to such transfer.
- likewise, no loans of more than US\$1 million shall be contracted by Zvartnots unless EBRD agrees.

7.62 These conditionalities, added to the fact that the cargo terminal project might prove to be somewhat dubious, its capacity being in excess over projected traffic (see para. 7.33), impose substantial pressure on the financial situation of Zvartnots airport, and considerably restrict any debt or investment capacity for other needed projects, including passenger terminal rehabilitation. Furthermore, the “no substantial transfer” provision of the loan might cause problems or delays with the separation of ATC from the airport. Last but not least, according to current taxation laws in Armenia, both principal *and interest* payments must be paid after tax. Usual accounting practices in Western countries enable deduction of interest payments from taxable profits.

7.63 Zvartnots airport officials are well aware of the financial difficulties coming ahead. As required by the EBRD loan agreement, a tariff adjustment study was carried out by the airport. The study takes into account several traffic demand scenarios and provides estimates on cargo handling tariff increases in order for the project to be financially sustainable. Its base scenario forecasts cargo traffic growth of 6 percent per year over the debt repayment period. With this relatively optimistic assumption, cargo handling tariffs would need to increase to about

US\$200/ton by 2003, or at about international levels. Based on more conservative and updated traffic forecasts, preliminary projections for the airport as a whole indicate that tariff increases would need to be even steeper, to about US\$250/ton by year 2000 (see Financial Restructuring below).

7.64 The cargo terminal project has raised several other restructuring issues among airport, airline and civil aviation officials, and some actions recommended above have already been implemented. Transfer of cargo handling responsibilities, for instance, was recently undertaken<sup>24</sup>.

7.65 Financial Restructuring. Many difficulties, however, and not only related to the cargo terminal project, remain unresolved and would need to be addressed with urgency. Today, the airport does not have any investment capacity, and unless more efforts towards financial adjustment and restructuring are undertaken with urgency, no funds would be available for the necessary rehabilitation of the passenger terminal, and EBRD loan repayments. During the first years (1998-2000), loan principal reimbursement would be extremely difficult to meet.

7.66 A financial adjustment and restructuring plan for the airport as a whole, along with corresponding financial projections (see Tables VII.3 and VII.4 below, and Tables 7.14 to 7.17, Statistical Appendix), was developed. Financial projections were based on the border-opening scenario (see Chapter III). The proposed plan would require the separation of ATC from the airport in 1997. It also provides an outline of the actions needed *as a minimum* for Zvartnots to improve its operating and financial practices and avoid further decapitalization of its asset base while being able to meet the debt service requirements of the cargo terminal project. The specific areas which are addressed are: (i) asset revaluation; (ii) tariff adjustment; (iii) staff reduction and salary increases; and (iv) a cost-reduction program. Zvartnots airport is already envisaging restructuring actions in each of these areas.

(i) *Asset Revaluation*. A detailed airport-specific asset revaluation made by qualified auditors is recommended, taking into account all assets in working condition while writing off, selling and/or auctioning all unused, unnecessary or non-airport activity assets. The average remaining life of the re-valued assets, along with the corresponding average depreciation rate, would then be assessed and revised as necessary. Preliminary estimates would re-value net assets from current US\$1 million to about US\$70 million, to be depreciated over 18 years.

---

<sup>24</sup> Until early 1996, Zvartnots Airport was not in charge of cargo handling. This activity, including all tariffs, used to be managed by Armenian Airlines. At the time, the airport was only earning slightly more than US\$6 per ton of cargo in the form of a surcharge, as well as rent from leased facilities. During the fall of 1995, the General Department of Civil Aviation of Armenia ruled that all cargo handling operations should be transferred to Zvartnots. It was agreed that over a transitional period of time, Armenian Airlines would temporarily continue handling of cargo transported by its own aircraft. As cargo handling services provided by Zvartnots or a contracted independent operator develop, however, Armenian Airlines' involvement in this activity would terminate.

(ii) *Tariff Adjustment.* In order to reflect the costs of the services provided and to generate enough funds to cover rehabilitation and cargo terminal project investments, tariff adjustments in all airport activities should be implemented with urgency. Passenger taxes and aircraft take-off charges could be slightly increased to international levels (passenger taxes to about US\$7/passenger, and take-off charges to US\$11/ton, before VAT). Periodic revisions of the cargo handling tariff adjustment study are also recommended in order to reflect updated traffic forecasts in the schedule of tariff increases. Today, given the sharp decline in cargo traffic observed in 1996, a cargo handling charge increase to about US\$250/ton by year 2000 appears necessary.

(iii) *Staff Reduction and Salary Increase.* Zvartnots airport currently employs about 1,900 people, including ATC staff. In light of international comparisons with other airports of similar size and given current traffic levels, a progressive staff reduction to about 1,000 employees, after separation from ATC, is recommended. Staff reduction would be compensated by severance payments of up to 2 years of salary. These severance payments, representing an estimated US\$2.3 million over 8 years are financially feasible and have been factored in the financial projections. Such payments would also give employees incentives to consider leaving the entity and increase the number of voluntary departures. At the same time, in order to retain qualified human resources, and contingent on labor productivity improvements, salaries would need to increase, by about 20 percent per year.

(iv) *Cost-reduction Program.* Such a program would include an analysis and rationalization of the airport's cost structure, divestiture from any non-airport-related activity and sale or auction of unused or unnecessary assets. Private companies should also be allowed to operate activities that may or may not be directly linked with airport operations.

**Table VII.3 Zvartnots Airport - Summary Income Statement Projections**  
(1995 US\$ mln, unless otherwise indicated)

	1995*	1996	1997	1998	1999	2000	2001	2002	2003
<b>Traffic</b>									
Aircraft Take-offs (th. movements)	7.	6.	7.	7.	7.	7.	8.	8.	8.
Departing Passengers (th. pass.)	403.	430.	443.	456.	470.	489.	508.	529.	550.
Cargo Turnover (th. ton)	42.	20.	20.	21.	21.	22.	23.	25.	26.
<b>Tariffs</b>									
Take-off Charge (US\$/ton)	8.	8.	10.	11.	11.	11.	11.	11.	11.
Passenger Tax (US\$/pass.)	4.	4.	5.	6.	7.	7.	7.	7.	7.
Cargo Handling Tariff (US\$/ton)	6.	52.	120.	170.	220.	250.	250.	250.	250.
Zvartnots Airport Staff	1,91	1,81	1,75	1,40	1,30	1,20	1,11	1,05	1,00
Operating Revenues	8.32	8.94	11.50	13.85	15.81	17.10	17.83	18.59	19.38
Operating Expenses	5.60	6.69	6.44	7.19	7.05	7.52	8.00	8.49	9.10
Depreciation	0.05	6.01	6.15	7.51	7.71	7.95	8.24	8.56	8.91
Net Profit After Tax	1.97	(3.85)	(2.29)	(2.28)	(0.62)	(0.05)	0.09	0.21	0.26
<b>Ratios</b>									
(Expenses+Depr.) / Revenues	68%	142%	109%	106%	93%	90%	91%	92%	93%
Net Profit as % of Revenues	23.7%	-43.1%	-19.9%	-16.5%	-3.9%	-0.3%	0.5%	1.1%	1.3%

\* Actual, 1995

7.67 The financial projections also take into account actions to improve billing and collection performance. Payables would be brought down to less than 2 months of expenses, while receivables would decrease to about 1 month of total revenues.

**Table VII.4 Zvartnots Airport - Summary Balance Sheet Projections (1995 US\$ mln)**

	1995*	1996	1997	1998	1999	2000	2001	2002	2003
<b>Total Assets</b>									
Total Assets	3.31	73.41	92.40	88.68	85.40	82.85	80.61	78.49	76.44
Fixed Assets	1.08	71.21	89.97	86.16	82.95	80.25	77.91	75.75	73.59
Current Assets & Long-Term Inv.	2.22	2.20	2.43	2.53	2.45	2.61	2.70	2.74	2.85
<b>Total Equity and Liabilities</b>									
Total Equity and Liabilities	3.31	73.41	92.40	88.68	85.40	82.85	80.61	78.49	76.44
Equity and Reserves	1.59	71.27	68.98	66.70	66.08	66.03	66.12	66.33	66.59
Long-Term Debt	0.00	0.50	21.66	20.40	18.00	15.60	13.20	10.80	8.40
Current Liabilities	1.72	1.64	1.76	1.59	1.32	1.22	1.29	1.36	1.45
<b>Ratios</b>									
Current Assets/Current Liabilities	1.30	1.34	1.38	1.59	1.85	2.13	2.09	2.01	1.96
Days of Payables	102	88	98	80	68	59	58	58	57

\* Actual, 1995

7.68 ATC finances. Since 1994, when Armenia joined IATA, ATC revenues have been collected by the international organization and subsequently transmitted to a Zvartnots airport account. Following talks on the possible creation of a separated ATC entity in 1994, these revenues were considered by the airport as a liability to the future ATC enterprise, and therefore included as a payable<sup>25</sup> on Zvartnots' 1994 balance sheets. Since no significant progress on the separation of ATC was made since then, and given that all ATC expenses are still being covered by Zvartnots, airport officials decided in 1995 to cross out all ATC liabilities and consider the corresponding amount as normal airport retained earnings.

7.69 Total ATC revenues for 1995 were estimated at about US\$1 million (before tax, see footnote) by airport officials. ATC expenses are estimated at about 20 percent of total Zvartnots expenses, or slightly more than US\$1 million for 1995. Separation of ATC from the airport, as recommended in paras. 7.16 and 7.17, is urgent. Even before actual separation, increased accounting transparency through separation of airport and ATC financial statements is necessary.

---

<sup>25</sup> after deduction of a 30% profit tax on the total ATC revenue amount. The tax inspectorate considers such revenues as pure airport profits, related expenses being already deducted from normal airport revenues.

## VIII. TRANSPORT, ENVIRONMENT and RESETTLEMENT

### A. Transport and the Environment

8.1 **Environmental Issues in the Transport Sector.** The main environmental impact of transport in Armenia is air pollution, caused by emission of poisonous gasses. Before 1988, 60 percent of the air pollution in Yerevan was caused by transport. At present, with practically no industrial activity, this figure is even higher, although the absolute level of pollution is significantly lower. There are no detailed reliable statistics on all environmental aspects in the transport sector. In order to give indications on general pollution levels and for the purpose of this study, some major pollutants have been chosen. Table VIII.1 below describes the levels of emission of these pollutants per sector.

**Table VIII.1** Emission of major pollutants per sector

Aspect	1987 (%)	1994 (%)	
<b>CO -emission (tons)</b> industry	27,234 ( 7)	1,616 ( 1)	
	transport	374,674 ( 93)	126,418 ( 99)
	energy	9 ( 0)	negligible ( 0)
	total	401,917 (100)	128,034 (100)
<b>NO<sub>x</sub>-emission (tons)</b> industry	5,011 ( 10)	553 ( 5)	
	transport	22,067 ( 44)	7,857 ( 66)
	energy	23,167 ( 46)	3,445 ( 29)
	total	50,245 (100)	11,855 (100)
<b>SO<sub>2</sub>-emission (tons)</b> industry	42,954 ( 39)	2,049 ( 48)	
	transport	negligible ( 0)	negligible ( 0)
	energy	67,625 ( 61)	2,192 ( 52)
	total	110,579 (100)	4,241 (100)

8.2 As shown in the table, the impact of the transport sector on the emission of some major pollutants (except for SO<sub>2</sub>) has increased significantly between 1987 and 1994. The transport sector uses very little diesel fuel (see table VIII.3) and SO<sub>2</sub> pollution is therefore very limited compared to other sectors.

8.3 Practically all environmental pollution caused by transport is concentrated in Yerevan, an area also affected by the concentration of industry (although at the moment production is at only one tenth of capacity) and high population density (about one-third of the entire population of Armenia lives in the capital city). More than one-third of all CO and NO<sub>x</sub> emissions in Armenia, for instance, take place in Yerevan (see Table VIII.2 below). There are no data available on the pollution by particles and smut. It can be assumed that pollution of this type (caused by diesel vehicles and badly maintained gasoline vehicles) is concentrated in the

city centres. The same applies for lead emissions. The levels of lead pollution in the air are very high, far above Western standards.

**Table VIII.2** Emissions in the transport sector

Aspect	1988	1994
<b>Total Armenia:</b>		
CO -emission (tons)	374,674	126,418
NO <sub>x</sub> -emission (tons)	22,067	7,857
<b>Yerevan city:</b>		
CO -emission (tons)	139,996	51,896
NO <sub>x</sub> -emission (tons)	13,384	3,119
lead-emission (µg/m <sup>3</sup> )	0.197	0.402

Source: Ministry of the Environment

8.4 Other environmental impacts, besides the main problem of air pollution, can be identified: noise pollution, excess energy consumption, land use, traffic safety, and water and soil pollution.

8.5 The problem of noise pollution falls under the responsibility of the Ministry of Health, and there are no transport-specific statistics on the problem in Armenia. There is no regulation in this field and standards apply only to maximum levels that can cause ear damage. Since traffic volumes are still very low, noise pollution is not a major environmental problem. Air transport can be considered as the transport mode producing the most noise. Given current air traffic levels and the location of the airport and its runways, there are no immediate problems in this regard either.

8.6 The use of energy in transport is directly related to a number of environmental problems. The more energy efficient the system is, the less polluting. CO<sub>2</sub> emissions in particular are directly related to the amount and type of energy used in transport. Table VIII.3 below describes energy consumption per type of fuel.

**Table VIII.3** Energy Consumption per Type of Fuel in the Transport Sector

Fuel	1988 (%)	1994 (%)
Gasoline (KTOE)	607 (58)	329 (57)
Diesel (KTOE)	175 (17)	59 (10)
Natural Gas/LPG (KTOE)	27 ( 2)	46 ( 8)
Electricity (KTOE)	39 ( 4)	18 ( 3)
Kerosene (KTOE)	200 (19)	130 (22)
<b>Total Energy Consumption (KTOE)</b>	<b>1,050 (100)</b>	<b>582 (100)</b>

Sources: Ministry of the Environment, Energy Research Institute-TACIS

Note: KTOE = thousand (kilo) tons oil equivalent

8.7 Due to the uncertain economic situation, the levels described above can fluctuate widely. This fluctuation can have a great impact on the environment. When, some years ago, the importation of fuel was very difficult because of the blockade and diesel fuel was available at a lower price than gasoline, many drivers mixed both fuels up to a 50-50 level and used this mixture in gasoline vehicles. The air pollution caused by this practice was enormous.

8.8 Fuel quality is very poor and there is no monitoring of octane levels or lead concentration. Such controls are anyway difficult to carry out because of the system of distribution of fuel. Fuel now comes into the country by way of private tanker trucks and is sold in very small quantities (mostly jerrycans) by thousands of individuals at curbside in cities and along major roads throughout the country. A relatively large amount of gasoline evaporates and is spoiled. There exist a lack of data on this environmental problem.

8.9 Because of fuel supply uncertainties, and in order to decrease the dependency on crude oil, the use of compressed natural gas (CNG) for transport was introduced and encouraged. A number of buses and taxis have been adapted to this fuel, which is imported by pipeline and compressed in special filling stations. At present, there are 6 CNG filling stations. Construction of 4 new filling stations is foreseen before the year 2000, and another 3 before 2005. Overall, approximately 8 million m<sup>3</sup> gas is used for transport, which is less than 1 percent of the total natural gas consumption. Equipped with 8 gas cylinders, the maximum range of a medium sized CNG bus is approximately 400 km. The level of emission of a gas vehicle is very low compared to diesel or gasoline vehicles. In an urban environment, CNG can contribute to a relatively clean transport system.

8.10 The same applies for electricity, which, locally, causes no air pollution at all, although is dependent on nuclear power generation. Tramways, trolleybuses, metro and electric railways are, therefore, a more environmentally friendly means of transport than private cars, mini vans and diesel buses. Furthermore, trolleybuses produce less noise pollution.

8.11 Road transport is a major user of surface infrastructure. Roads, crossings and parking facilities require space, which is scarce in urban areas. With present transport volumes, land use by transport is not a problem. When transport volumes increase, lack of parking space in the centres of major towns might become a problem. Before 1988, the city of Yerevan already had problems in this field, with congestion and limited parking facilities.

8.12 Although there is incomplete information on traffic safety in Armenia, the condition of the roads (poorly maintained, badly illuminated) and vehicles are major threats to traffic safety. At present, there is no education or training in this field, and drivers licenses can easily be obtained. Accidents and injury rates are high. While transport volume remains low, the absolute number of casualties and deaths will be relatively low, but when volumes rise, traffic safety will become evident as a major problem (see paras. 5.8 to 5.12).

8.13 The problem of soil pollution caused by small-scale fuel distribution has already been described. Maintenance, carried out in the open air, also creates soil pollution. Pollutants can easily reach the ground water level in Yerevan and many other parts of Armenia, where ground water levels are relatively high.

8.14 **Current and Prospective Developments.** In an absolute sense, the impact of the transport sector on the environment in Armenia is relatively low. Transport demand, both for passengers and freight, has considerably decreased (see Chapter III), and at present represents a small fraction of pre-Independence volumes. All environmental problems related to this traffic (noise and air pollution, energy consumption, traffic safety, congestion etc.) are therefore limited as well at the moment.

8.15 At the same time, the technical condition of all vehicles (cars, taxis, buses, mini vans and trucks) is very poor, due to lack of proper maintenance and a very high average vehicle age (>10 years). There is no effective monitoring and control both on emissions, fuel quality and traffic regulations. A driver's licence can be bought without adequate training, and driving schools and lessons, for which there is no demand, are considered a luxury today.

8.16 The former environmental inspection bodies have practically ceased to exist. Of the 15 centres that dealt with air pollution monitoring before 1988, only 1 is still operating today. There also used to be 58 controlling points for the measuring of emissions of vehicles; only 5 have remained open. There is also a shortage of equipment for the measurement of CO.

8.17 Before 1988, Armenia was following and enforcing FSU regulations in the field of emissions and energy use. Armenia had its own regulations in the field of safety of gas vehicles (before 1988: LPG; after 1988: CNG). There also was a regulation that prohibited the use of leaded fuel in the city of Yerevan. This regulation was not enforced, however.

8.18 A special research institute (with its laboratory) for transport pollution existed. There were controlling units for emissions, noise pollution and fuel quality. Such units also existed for water resources, which had their own laboratories. All of these units were financed by the State. A total of more than 200 people were engaged in the monitoring and control of pollution in the transport sector.

8.19 After 1988, all resources for these institutes disappeared and the institutes themselves disappeared. Nowadays, attempts are being made to privatise part of the activities that were carried out by the former institutes. Private inspection and maintenance units could for example take over some control and monitoring operations. Because most of the state enterprises are being privatised, however, the task of monitoring environmental aspects will become much more complicated than in the past. Today, some private companies have control units and traffic police have the possibility to control emissions and noise pollution, but in practice there is little attention given to environmental matters.

8.20 At present, practically no co-ordination exists between various ministries, local governments and private companies in the environmental aspects of transport. There are no reliable transport environmental statistics. The legal framework for enforcing environmental policy in general exists, fiscal (taxes) and financial incentives (penalties) included. There are well-developed ideas for an environmental policy in the transport sector. However, as transport volumes are still very low, no priority is given to implementing regulations or proposed ideas.

8.21 When traffic volumes rise again, the environmental impact of transport will increase exponentially. The first and main environmental problem will be air pollution in urban areas, especially within the city of Yerevan, given its specific geography aspects. As, in the meantime, industrial activity would increase again, air pollution will become a major threat to health and well-being.

8.22 Economic growth will, to some extent, autonomously contribute to a cleaner environment. With new vehicles being up to 400 times cleaner than the present cars and buses in Armenia, modernisation will significantly improve air quality. At present, the level of emission of NO<sub>x</sub> per kg fuel used in Armenia is 250 times the average level in Western Europe. Fuel quality is also likely to improve when demand increases and new vehicle technology is introduced. However, when transport volumes grow due to economic growth, other environmental problems may arise such as congestion, accident risks, increased use of space and higher energy consumption. The proper implementation of measures as recommended below would enhance the positive impact of economic growth and traffic recovery on the environment, while mitigating its negative effects.

8.23 **Conclusions and Recommendations.** The most effective measures in order to prevent the transport sector in Armenia from polluting the environment are those that aim at the reduction of air pollution. Emission of lead and traffic safety also represent major threats to health and the environment and should be addressed with urgency. Priority should be given to the Yerevan area, where population density is the highest and most industrial activity is located.

8.24 The following recommended actions are classified according to (a) general financial and fiscal measures and incentives, and (b) specific technical and organisational measures.

#### General Financial and Fiscal Measures

- Introduction of financial incentives for cleaner vehicles, through differentiated road and fuel taxes;
- Provision of unleaded fuel at the same or a lower price than leaded fuel and gradual elimination of lead;
- Introduction of tax exemptions for natural gas vehicles, combined with tax increases for polluting vehicles; and
- Elaboration of a penalty system for extremely polluting vehicles.

### Specific Technical and Organisational Measures

- Re-establishment and modernisation of vehicle inspection stations, with introduction of a monitoring system for extremely polluting vehicles;
- Extension of the infrastructure for natural gas distribution by intensifying the program for CNG filling stations;
- If and when economically justified, conservation and improvement of electric traction in public transport (trolley bus, tram, metro and railways) and improved maintenance of infrastructure (rails, overhead wires) and equipment;
- Improvement of traffic flows by re-activating traffic lights and re-introducing green waves; and
- Improvement of co-ordination between all governmental bodies (ministries, local governments, police) and elaboration and implementation of an overall policy in the field of transport and the environment.

8.25 Practically all of these measures belong to the type “good housekeeping” and “increase of efficiency”. The real potential for an effective environmental policy lies in the improvement of these two fields, where FSU organisations and practices were characterised by deficiencies.

8.26 A sound economic basis is required in order to implement most measures. When taking into account external costs, the measures proposed above, if properly implemented, are directly or indirectly financially sustainable. In order to create an environmentally and financially sustainable transport system, it is necessary to consider both internal and external costs. In Western Europe, external costs can add up to 50 percent of the internal costs in the case of private road transport. In some cases, inclusion of external costs in a cost-benefit analysis can justify some kind of support to the transport environmental program above. The latter could even become financially sustainable if costs were recovered from polluters. Such situations, however, are all the more justified when traffic is substantial. This is not the case in Armenia for the moment.

### **B. Involuntary Resettlement**

8.27 Even though no green field projects regarding environmental issues are expected in the near future, there may be transport projects which may need to make use of urban or agricultural land that is in private hands. The issue of defining compensation mechanisms prior to the use of such land needs to be addressed.

8.28 In most FSU countries, guidelines for development of resettlement plans and for assessing compensation for loss of land and infrastructure were prepared by the Ministry of Agriculture. The Ministry of Agriculture usually plays the main role in assessing land

compensation, receiving compensation money from a project proponent, and developing plans for the spending of money with the general objective of increasing soil fertility in the rayon(s) in which the development is to occur.

8.29 Land compensation is usually organized between Ministries with money transferred from the proponent Ministry to a special land compensation account held by the Ministry of Agriculture. Money for projects that increase soil fertility is directly disbursed from this account. The rayon executive committee does not appear to have a pivotal role in assessing or identifying targets for disbursing funds received for land compensation.

8.30 The case of Armenia, based on these typical FSU regulations, has evolved with land reform. Indeed, as early as 1991, Armenia started implementing one of the most comprehensive land reform programs in the FSU. Most land has already been privatized, the traditional Soviet kolkhoz/sovkhoz system has been disbanded, and private farming and services have already started to operate.

8.31 Land reform and privatization were mainly implemented at the village level by local committees formed by local village councils. The distribution of land ownership rights was guided by four principles: (i) priority to village residents; (ii) quantity of land according to family size; (iii) location of individual units decided by lottery; and (iv) land received has to be paid for.

8.32 Despite formidable progress on the land reform issues, further actions are needed, including support and advisory services for the elaboration of a sound institutional framework for a land market. Such a framework would include national guidelines for compensation related to loss of houses, crops on household plots, and improvements made to the land, which do not appear to exist today. Generally, a commission is formed to review resettlement compensation for each project on a case-by-case basis. This commission is formed at the local level and is often chaired by a municipal mayor or chairman of a rayon executive council. *Substantial legal work is required to properly compensate legal owners in the future.*

---

## IX. RECOMMENDATIONS

### A. Overview

9.1 The recommendations emerging from the previous chapters support and advance the adjustment of the transport sector consistent with the program of economic reforms set forth by the Armenian Government. There is an element of uncertainty as to how the political relationships and the economic consequences of these relationships of Armenia and the surrounding countries may eventually evolve. All recommendations in the present report and summarized in this chapter are based on the *border-opening* scenario (see Chapter III). They follow the gradual recovery and trade led expansion scenario developed during the preparation of the World Bank SAC operation. Trade with non-CIS countries, following the opening of the border with Turkey and the development of new trade and economic channels, is likely to increase substantially. Trade with CIS countries may continue to dominant, albeit at or close to international prices. The pace at which trade with traditional markets will recover, however, remains uncertain.

9.2 The chapter begins by setting out the basic transport development strategy and follows with recommendations cutting across the sector, i.e., policy, transport and trade facilitation, and the sub-sectors. The chapter closes with a discussion on investment priorities and possible Bank assistance.

### Transport Strategy

9.3 The objective of the transport development strategy for Armenia is to ensure that transport reflects the adjustment process and thus avoids becoming a bottleneck to economic development. Its elements can be grouped according to four basic orientations as follows:

- (a) Make the most effective use of existing capacity in the sector.
- (b) Move towards full cost recovery while reducing unit costs.
- (c) Reduce costs to trade.
- (d) Accelerate privatization of road transport.

Reliance on export development while adjusting to external shocks by means of increases in productivity and efficiency is at the core of the economic reform program. The potential contribution of transport to this process is significant since it will affect competitiveness of exports, help reduce energy intensity of the sector, and reverse the process of de-capitalization and dependence on Government transfers, which are no longer feasible. In all cases, however, valid Government options in the transport sector would only be those demonstrably contributing towards these strategic goals.

## B. Sector Adjustment

9.4 In a scenario of continued economic reform and easing of regional tensions (*border-opening* scenario), the elements of the strategy responding to the needs of the sector to reform and adjustment are numerous. They are presented below as pertaining to: (a) policy reform; (b) trade and transport facilitation; and (c) sub-sector recommendations.

### Policy Reform

9.5 **Pricing.** Pricing for transport services needs to be determined by the market. This implies a removal of administrative controls and *privileged* or reduced fare passenger transport requirements, and adherence to a cost recovery policy. Although the stated Government policy indicates that the transport industry is to be run on a commercial basis, with freedom to adjust tariffs as necessary, in practice there is discriminatory pricing, cross subsidies, and absence of cost recovery. Coupled with low productivity made worse by the drop in economic activity, the net worth of transport enterprises has decreased. International transport prices should begin to approach those of European countries, and freight factors reduced (see paras. 2.32 to 2.34), provided that the market for these services is opened to international operators.

9.6 **Institutional Restructuring.** The role of Government within the proposed development strategy will be to implement the legal and institutional reforms necessary to: deregulate, liberalize and accelerate the privatization of the sector; revise and adjust policies to sustain the process; assure full cost recovery; guarantee internal mobilization of resources; and provide incentives to the private sector while reducing the Government's own direct participation.

9.7 The role of all transport agencies and enterprises within the strategy is to promote private-sector participation. They should focus on the following issues: expanding the physical reach of the sector; seeking technological innovation; improving managerial performance; and seeking investments and finance from private-sector resources, both national and foreign. Under this new role for the State, its main concerns would be to: a) assure transparency in markets for goods and services; b) allow price flexibility as a response to market signals; c) ensure freedom of entry and exit from markets; and d) eliminate existing restraints to the participation of the private sector.

9.8 The role of the donor community is to provide a coordinated flow of financial assistance; convey consistent policy advice; assist in policy formulation, implementation and review; make available finance for technical assistance and project preparation; and supervise project implementation and execution.

9.9 The regulatory and policy making functions over all transport sub-sectors should be consolidated within the Ministry of Transport. These would include: a) indicative overall and coordination planning; b) collection and dissemination of sector statistics on traffic, tariffs, investments, fixed assets, fleets, and stocks; c) provision as requested of authorizations and

licenses; and d) monitoring of compliance with safety and environmental standards. All road transport operational responsibilities under the Ministry of Transport (MOT) should be transferred to the private sector, and in the case of railways and air transport, to truly independent, commercially oriented entities.

9.10 For example, MOT should continue the process of putting both road construction and maintenance on a contractual basis with private companies, while focusing on developing its role as supervisor, regulator, and policy maker in the road construction industry. The remaining construction and maintenance companies currently under MOT should be privatized and all works awarded by competitive bidding.

9.11 **Deregulation and Liberalization of Markets.** To be successful, price flexibility needs to be accompanied by "transparency", i.e. equal and fair access to opportunities and information<sup>26</sup>, and freedom of entry and exit<sup>27</sup>. The aim of deregulation and liberalization of markets is to achieve these objectives. This in turn will contribute to the creation of an enabling environment to private economic activity in the sector and will accelerate the adaptation of transport to a changing economic environment.

9.12 An enabling environment, *which does not include guarantees or assurances of profitability*, is dependent on elements of the economic reform program such as: a) open, deregulated capital markets; b) continued availability of foreign exchange at or close to its opportunity cost; c) non-confiscatory tax systems; d) clear property rights under the law; e) no distinction between "national" and "foreign" private sectors vis-a-vis relevant legislation; and f) the perception by economic agents of a commitment to implement and uphold these elements on the part of the Government. This will create the perception of fairness, openness and freedom from intervention.

9.13. A freer transport sector will actually nurture and encourage entrepreneurial activity in other sectors. Small enterprises will be launched, and significant amounts of labor will be absorbed. The main areas of expansion and growth will be trucking and bus transport, freight forwarding, regional aviation and to a lesser extent railways.

---

<sup>25</sup> It implies the following: simplification of applicable commercial legal codes; contracting and procurement according to well known rules accessible to all parties; public bidding and notices of intent to procure required for all expenditures; and public appeal mechanisms to ensure that applicable rules are respected.

<sup>27</sup> This implies that: permits, licenses, selection of routes and determination of levels of service need to be free of Government intervention, other than actions necessary to enforce safety and environmental standards. Authorization to operate within the sector would become a right of those interested in doing so. In return, operators in the sector would be obligated to provide relevant operational data and information to the State. The only exception to this policy would relate to limited Government regulations that would be required in the allocation of urban transport bus routes.

9.14. **Privatization.** Acceleration of the implementation of the program to privatize road and bridge construction and maintenance enterprises is recommended. Such a program would reduce overhead and unit costs and improve the quality of rehabilitation and maintenance of roads. The program announced by the Government has been implemented slowly partly due to lack of progress in privatizing ARD's District Enterprises. In the initial stages of privatization, the formation of joint ventures with foreign companies and the continued encouragement of equipment leasing arrangements from road construction equipment pools (which should also eventually be privatized) to private contractors should be considered.

9.15 Road transport services should be privatized as well. The 3-year government privatization program announced in 1994 is advancing slowly, and private trucking is still almost non-existent in Armenia. This lack of progress has been due to resistance to liquidate insolvent operations: over 50 percent of the truck fleet is idle. Assets should be auctioned off to small entrepreneurs to increase competition in the industry. International transport would be more competitive and efficient if the existing concentration of fleets were broken up and international transport companies were allowed to operate in Armenia.

9.16 **Commercialization.** Transport entities that are not privatized outright should operate on a commercial basis. Their operations should be financially sustainable and cost recovery should be sufficient for maintenance, renewals, and all direct expenses. They should operate as independent concerns free from interference from the Government beyond the technical oversight of regulatory agencies. This would be the case of air transport and the railways.

9.17 **Financial Restructuring.** The commercial operations of publicly owned transport entities with excess capacity and staff will make the financial restructuring of these entities unavoidable. Downsizing, liquidation of unnecessary assets, divestiture of non transport assets and operations, revaluation of assets, implementation of arrears repayment and offsetting mechanisms and definition of development plans compatible with the entities' own debt capacity should be addressed as a matter of urgency. Table IX.1 below summarizes the actions recommended in preceding chapters. *The restructuring proposed is geared to obtaining cost recovery, increasing productivity, covering renewals and debt service, and gradual modernization of the sector.*

9.18 **Expected Effects Of The Policy Reforms.** The implications of the recommended policy reforms on the overall financial situation of the sector are significant. Figure IX.1 below and Tables 9.1 a, b and c of the Statistical Appendix compares the evolution of the transport sector's gross public surplus<sup>28</sup> under the three scenarios presented in Chapter III (*status quo, border-opening and peace in Transcaucasia* scenarios).

---

<sup>28</sup> Defined as the sum of projected gross profits, under each scenario, of all the transport sub-sectors which are likely to remain State-owned in the short-term (Armenian railways, Armenian Airlines, Zvartnots airport and the Metro of Yerevan). Trucking and bus transport would be operated by the private sector. The impact of road infrastructure cash-flows in the sector's gross public surplus is treated separately in para. 9.21.

9.19 To facilitate comparisons, gross public surplus projections assume that, for all three scenarios, each transport sub-sector is constrained by same the requirements of an adjustment program (including asset revaluation to realistic levels, adequate provisioning of depreciation and maintenance, salary increases and minimal renewals and moderate investments to stop asset erosion and remove key transport bottlenecks) and an effective budget constraint. Sub-sector responses to these external constraints vary according to each scenario.

9.20 Under the *status quo* scenario, where no adequate strategy would challenge the adjustment constraints, the transport sector would experience losses and de-capitalization amounting to more than US\$50 million per year by 2003. Current losses already exceed US\$15 million/year. By contrast, the successful implementation of the policy of reforms and transport sector adjustment as suggested in this report would generate a gross public surplus of about US\$5 million per year after 2000 under the *border-opening* scenario, and in excess of US\$15 million/year after 2000 under the *peace in Transcaucasia* scenario. These surpluses would occur after renewals and moderate investments in the sector have been reestablished.

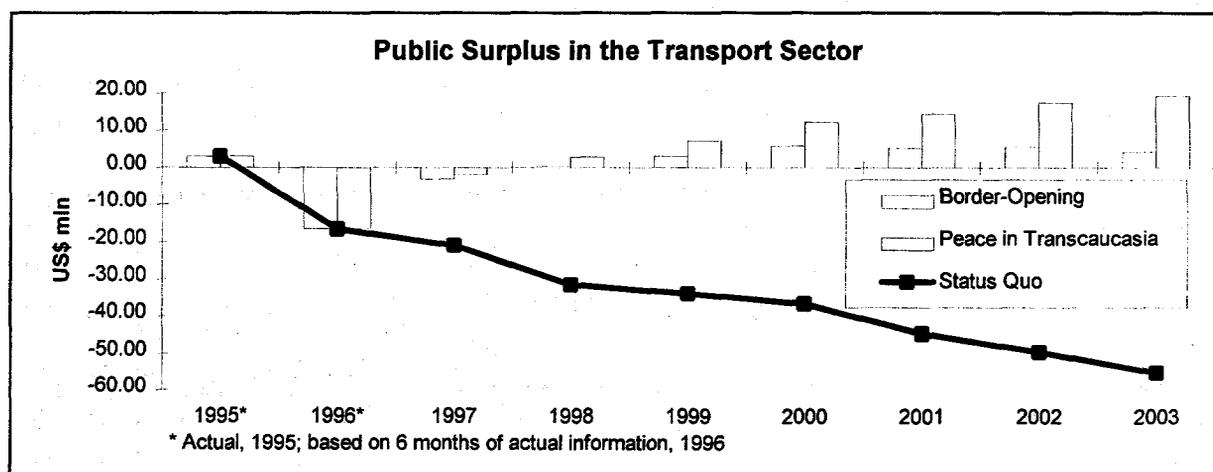


Figure IX.1

9.21 Gross public surplus estimates shown in Figure IX.1 do not include road infrastructure cash-flows. The Armenian Road Directorate (ARD) estimates that the road infrastructure funding requirements for maintenance are about US\$45 million/year, after the deferred maintenance backlog of about US\$ 100 million has been eliminated. The proposed road user charge system based on a fuel surtax would generate an estimated US\$5 to 7 million per year, depending on the scenario taken. Limited State budget allocations for road infrastructure works and proceeds from the World Bank Highway Project credit would be additional sources of funds. If the road user charge proposal is indeed implemented, the financial shortfall of the sub-sector would exceed US\$55 million/year on average over the next seven years, under the optimistic *peace in Transcaucasia* scenario. A major revision of the road user charge system so as to include additional road user charges (like transit and axle load charges as well as vehicle registration fees), whose proceeds would be allocated to road maintenance and rehabilitation, is urgently needed to

confront the erosion of Armenia's road network. At the same time, an adjustment of ARD's work program to bring it into balance with available resources will be necessary.

Table IX.1

**TRANSPORT SECTOR  
FINANCIAL ADJUSTMENT and RESTRUCTURING PLANS**

ACTIONS	Railways	Metro
<b>Asset Restructuring</b>		
Net Assets Revaluation	From current \$14 mln to about \$110 mln	From current \$6.7 mln to about \$100 mln
Depreciation	Full depreciation over 20 yrs	Full depreciation over about 33 yrs
<b>Tariff Adjustment and Rationalization</b>		
Recommended Tariffs (or Charges) Increase	<u>Passenger</u> : from current 0.52 USc/pass.km to 3.00 USc/pass.km in 1997 <u>Freight</u> : from current 2.00 USc/ton.km to 7.50 USc/ton.km by 2002	From current 7 USc/trip to 25 USc/trip by 1999 and 28 USc/trip by 2003
Other Recommended Measures	Discontinuation of passenger service by 1998, and, in the meantime, termination of privileged or reduced fare passenger transport requirements	Termination of privileged or reduced fare passenger transport requirements
<b>Staff Reduction and Salary Increases</b>		
Staff Reduction	From current 6,650 to about 3,000 employees over the next 3 years	From current 1,440 to about 1,200 employees over the next 2 years
Salary Increase	From current \$20/month to \$35 in 1997; 20% yearly growth thereafter	From current \$34/month to \$50 in 1997; 20% yearly growth thereafter
Severance Payment	Up to 2 years of salary	Up to 2 years of salary
<b>Cost Reduction Program</b>		
Divestiture of Non-Transport Activities	Mainly non-railway commercial activities, including trade	All non-metro activities
Other Measures	Rationalization of the cost structure of the railways, including closure of all unprofitable services, rationalization of the number of shops and depots on the network & sale or rental of industrial branch lines to their main users.	Sale of unused or unnecessary assets; sale or rental of Metro premises and sites for advertising, newsstands, etc.
<b>Arrears Repayment Program</b>		
Exploration of Arrears Offsetting Mechanisms	Including, for instance, repayment of State-owned entity receivables with current and future tax payables	Including, for instance, repayment of State budget subsidy arrears with current and future tax payables

**Trucking,  
Taxis,  
Urban &  
Inter-Urban  
Bus  
Transport**

 P  
R  
I  
V  
A  
T  
I  
Z  
A  
T  
I  
O  
N

 of  
the

 SUB  
SECTOR

ACTIONS	Armenian Airlines	Zvartnots Airport (following urgently needed separation from Air Traffic Control)
<b>Asset Restructuring</b>		
Net Assets Revaluation	Revaluation and depreciation of assets so as to initially reach about US\$ 6 million in depreciation provisioning per year. This would amount to depreciate current gross assets (US\$58 mln) by 10%/yr.	From current \$1 mln to about \$70 mln
Depreciation		Full depreciation over 18 yrs
<b>Tariff Adjustment and Rationalization</b>		
Recommended Tariffs (or Charges) Increase	<u>Passenger</u> : from current 6.5 USc/pass.km to 7.6 USc/pass.km by 1999 <u>Freight</u> : from 60.6 USc/ton.km in 1995 to 70.0 USc/ton.km by 2001	<u>Take-off charge</u> : from current \$8.3/take-off to \$11/take-off by 1998 <u>Cargo handling tariff</u> : from current \$53/ton to \$250/ton by 2000 <u>Passenger Tax</u> : from current \$4.8/pass. to \$7.0/pass. by 1999
Other Recommended Measures	Elimination of tariff discrimination between CIS and foreign citizens wherever possible; revision of tour-operator discount policies	Periodic revisions of cargo handling tariffs to guarantee proper coverage of the new cargo terminal debt service requirements
<b>Staff Reduction and Salary Increases</b>		
Staff Reduction	From current 1,950 to about 1,000 employees over the next 5 years	From current 1,810 to about 1,200 employees by 2000; 1,000 by 2003
Salary Increase	about 15% growth per year from current \$142/month	20% growth per year from current \$66/month
Severance Payment	Up to 2 years of salary	Up to 2 years of salary
<b>Cost Reduction Program</b>		
Divestiture of Non-Transport Activities	All non-airline activities	All non-airport activities
Other Measures	Allow private companies to operate activities not directly related to air transportation and/or establish joint ventures for these	Allow private companies to operate activities not directly related to the airport and/or establish joint ventures for these

## Transport and Trade Facilitation

9.22 Main recommendations are as follows:

- (a) **Participation in Trade and Transport Related International Conventions** (paras. 4.7 and following). Given its extreme shortage of financial resources, Armenia's participation in International Conventions must be planned with the utmost parsimony, after establishing that the quantitative advantages of such participation unequivocally outweigh the initial and recurring costs. In these conditions, it is necessary that the professional organizations --usually private-- that must be created in connection with each Convention be operated as businesses. It must be cost-effective for users to join. The organization must break even. Clear benefits should accrue to national trade and transport activities.

It is recommended that an independent study be conducted for a number of Conventions of potential interest to Armenia. This study will identify prospective members, develop marketing and business plans, and conduct cash-flow and benefit-cost analyses. It will determine the relative usefulness, urgency and viability of each of these Conventions. It will rank their priorities and establish realistic time-tables for their acceptance (see paras. 4.15 to 4.18)

- (b) **Customs Procedures** (paras. 4.29 and following). The Republic of Armenia has achieved considerable progress in its customs procedures by the adoption and operation of the ASYCUDA computerized customs data system. However, it is falling behind in terms of building construction and site layout for its numerous customs points and regional customs houses, none of which were required under the Soviet regime. Working conditions in the presently existing facilities are extremely severe, even though customs collections significantly and regularly contribute to the Government budget.

It is recommended that custom houses and warehouses be built in all regional customs points, namely at ARARAT, SHIRAK, GUGARK, and SYUNIC, and at the custom points of BAVRA, BAGRATASHEN, AKHURIC, and MARGARA, as well as GOGOYAN, PRIVOLNY and AYRUM. In addition, 50-60 ton weigh-machines should be installed in all the above mentioned custom houses and custom points. The cost of this project is about US\$4.2 million, estimated on the basis of similar construction recently completed. Cost recovery can be achieved over a period of two years, owing to improved customs operations and facilitation of VAT collections (see paras. 4.37 to 4.40)

- (c) **International Insurance** (paras. 4.19 and following). International insurance is a major bottleneck to trade and transport in Armenia. There is no credible insurance system that can be used for cars, trucks or cargo. Basic insurance legislation is

lacking, and contractual legal obligations are commonly breached. The Armenian market is small and risks are spread only with great difficulty. Reinsurance will not be available unless the market expands and the practice of insuring property becomes widespread, a condition linked to the generalization of private ownership.

It is recommended that appropriate legislation for the insurance sector be enacted, which will make it possible to create a free, non-monopolistic insurance market. A technical assistance project aimed at achieving this goal is necessary and urgent. It should be designed to make it possible to direct assistance funds and training to businesses liable to form successful entities. The partnership and cooperation of one or more foreign insurance companies in this project and in the future development of the sector is seen as necessary (see para. 4.21)

- (d) **Freight forwarding** (paras. 4.53 and following). Freight forwarding does not exist as a profession in Armenia for shipments bound beyond its borders. With the help of their foreign partners and correspondents, a few shipping companies partially fulfill this function for their large or foreign clients. The freight forwarding profession in the railways sector is conducted according to the Former Soviet Union system. By virtue of its landlocked status, most of Armenia's foreign trade is of a multimodal nature.

It is recommended that a technical assistance project be undertaken aimed at promoting the development and growth of a freight forwarding profession in Armenia by setting up an independent professional association, which will apply international practices aimed at protecting the owner of the merchandise shipped under the operator's complete responsibility, i.e. acting as a "principal" (see paras. 4.62 to 4.74)

### **Sub-sector Recommendations**

9.23 **Road Infrastructure.** The Government would need to consider actions along the following lines as being in the best interests of the economy and the population:

- (a) *Cost Recovery Measures.*- The resources available to the upkeep of the road network need to be brought more in line with current needs by means of a combination of cost recovery measures that generate resources from road users (see paras. 5.24 and 5.39 to 5.43);
- (b) *Project Selection.*- Measures should be further developed to reduce the cost of maintaining the road network by; (i) the systematic use of economic analysis as a basis for selecting the most appropriate time and kind of road maintenance; (ii) the use of improved road technology; and (iii) and timely maintenance interventions corresponding to the level of resources available (see paras. 5.44 to 5.46);

- (c) *Cost Reduction Measures.*- The upkeep costs of the network should be reduced by competitive bidding procedures for periodic maintenance, the use of routine maintenance by contract combined with further privatization of the road construction and maintenance industry, and the possible use of private road associations for low traffic roads (see paras. 5.44 to 5.46); and
- (d) *Monitoring Functions.*- In addition to the control of civil works, specific monitoring functions concerning traffic counts and periodic road condition surveys over the network, and safety measures to minimize accidents, would be necessary (paras. 5.10 and 5.11).

9.24 **Inter-Urban and International Road Freight and Passenger Transport.** Privatization, de-monopolization, and freeing entry to the market by both local and international transport companies as discussed above under policy reform is necessary. Inter-city and international services would be the prime candidates for privatization (see paras. 5.65 and 5.66).

9.25 **Urban Transport.** The problems of the urban transport system in Yerevan are more complex than those of the international or inter-urban sectors, and careful study is needed before final decisions could be reached with certainty. However, as in the international and inter-urban sectors, there is a strong case to be made for privatization of much of the system as quickly as possible. A careful study should be carried out to determine if it is worth trying to preserve the electric vehicle operations (except the Metro), which are incurring substantial losses and which would require a substantial investment to renew (see paras. 5.67 to 5.69).

9.26 The Metro would need to implement urgently a financial adjustment and restructuring plan. *Privileged* passenger fare exceptions should be removed and full cost recovery levels reached within the next five years. The restructuring program calls for actions on: (i) asset restructuring; (ii) tariff adjustment and rationalization; (iii) staff reduction and salary increases; (iv) a cost reduction program; and (v) an arrears repayment program (paras. 5.70 to 5.72).

9.27 **Railways.** The Armenian Railways have initiated their restructuring by reducing personnel and concentrating on their core business. Still, these efforts need to be continued as the rate at which the railways are de-capitalizing is significant and traffic is not likely to reach historic levels in the near future. The railways need to restructure and become a truly independent enterprise run according to commercial principles (see paras. 6.66 to 6.72). Assets and staff need further downsizing, tariffs need significant increases and the continuation of extremely unprofitable operations including passenger transport (paras. 6.36 to 6.38) and some freight services on under-utilized routes should be seriously questioned. Also, given current traffic levels, the option of favoring diesel traction rather than electrical traction deserves careful examination (see paras. 6.52 and 6.65).

9.28 **Air Transport.** Airline, airport, and traffic control operations need to be under independent management and operate on the basis of commercial principles. The policy of opening of Armenian skies to foreign airlines needs to be implemented urgently (see paras. 7.8 and 7.9). Also, given current excess capacity of Armenia's airport network, an Airport National Masterplan would be necessary to define priorities and ensure consistency in terms of airport investments (para. 7.31). Specific airport and airline recommendations are as follows:

*Zvartnots Airport*

- There is a need to separate airport and air traffic control operations (paras. 7.16 and 7.17)
- Financial restructuring of the airport is necessary (paras. 7.65 to 7.67).
- The airport will need to increase its revenues by adopting a marketing strategy to increase utilization of its freight terminal under construction (para. 7.34).
- A program to reduce unnecessary delays to passengers should be implemented (para. 7.32).

*Armenian Airlines*

- The airline needs to adjust its work force and continue its cost reduction and tariff increase efforts through the implementation of a financial restructuring plan (paras. 7.49 to 7.58).
- Exploration of mechanisms to provide guarantees to make fleet modernization possible is a high priority (paras. 7.27 and 7.28).

## **Investments**

9.29 All public investments adding to capacity in the highway, rail, air transport and metro sub-sectors need to be carefully evaluated. Available resources after fiscal measures, freeing of prices and financial restructuring, should be directed at maintaining and preserving core infrastructure and services. Capital investment projects for new construction planned or under consideration in all modes may not be feasible today nor in the immediate future (see, for instance, paras. 5.36 and 5.37 on Operation Crossroads).

## **Summary - Sectoral Priorities**

- **Define core network and services and clear maintenance and rehabilitation backlogs**
- **Privatize road transport industry and construction departments**
- **Restructure remaining public enterprises in all sub-sectors**
- **Implement transport and trade facilitation measures**

## Environment and Resettlement Recommendations

9.30 **Environment.** The most effective measures in order to prevent the transport sector in Armenia from polluting the environment are those that aim at the reduction of air pollution. Emission of lead and traffic safety also represent major threats to health and the environment and should be addressed with urgency. Priority should be given to the Yerevan area, where population density is the highest and most industrial activity is located.

9.31 While it is unlikely that Armenia will be economically able to initiate any large-scale transport projects in the near future, embarkation on a transport sector development program should be preceded by strengthening the institutional and physical capacity of environmental agencies (see paras. 8.23 to 8.26).

9.32 **Resettlement.** Despite formidable progress on the land reform issues, further actions are needed, including support and advisory services for the elaboration of a sound institutional framework for a land market. Such a framework would include national guidelines for compensation related to loss of houses, crops on household plots, and improvements made to the land, which do not appear to exist today. Generally, a commission is formed to review resettlement compensation for each project on a case-by-case basis. This commission is formed at the local level and is often chaired by a municipal mayor or chairman of a rayon executive council. Substantial legal work is required to properly compensate legal owners in the future (see paras. 8.27 to 8.32).

### C. Investment Priorities and Possible Bank Assistance

#### Short Term Assistance

9.33 Given the urgent needs to assist the Government of Armenia with the rehabilitation of transport infrastructure, it is proposed to start with an IDA credit for a Trade and Transport Facilitation Project for fiscal year 1999 at the earliest. The project would directly address existing bottlenecks and be a catalyst for the adjustment of the sector and restructuring of its institutions. It would have two main components, institution building and investments, as follows:

- **Institution Building Component**, which could include (i) support to teams preparing sector reforms; (ii) assistance for the formulation of technical and legal frameworks necessary to the restructuring, commercialization and privatization of sector entities<sup>29</sup>; and

---

<sup>29</sup> This sub-component could also include assistance for a study on the cost-effectiveness of urban transport electric vehicle operations (tram and trolley) in Yerevan. The study would help determine whether it is advantageous to continue to operate these electric systems.

(iii) managerial assistance for public and private transport enterprises. This component could be financed through donor grants.

- **Investment Component**, which could include the financing of selected equipment, spares, and rehabilitation works to remove existing bottlenecks in the transport sector, e.g. the most deteriorated bridges or critical sections of the railroad and road networks. This component, oriented to restore existing physical capacity to address current needs, *would not cover new investments in transport.*

These actions would amount to a necessary first step, and would lay down the basis on which to develop a program of financial assistance for transport once economic recovery is established.

9.34 The Trade and Transport Facilitation Project would be prepared in close collaboration and coordination with USAID, WFP, EU-TACIS and EBRD. Given the severity of current transport dysfunctions, it is also recommended that the short term phase of World Bank assistance be accelerated to the maximum extent possible under the Country Assistance Strategy for Armenia.

### **Medium Term Assistance**

9.35 The rehabilitation, restructuring, and orientation towards a market economy of operations in the sector could be assisted with additional lending over the following five year horizon. The extent of this medium term assistance would be subject to: (a) the successful implementation of the Transport Rehabilitation Project; (b) economic recovery in neighboring countries and demand for transit or international transport services; and (c) increased economic activity and transport demand. Possible World Bank and/or other donors assistance should be targeted as follows:

- **Rehabilitation of the Core Road Network.** Clearance of Armenia's severe backlog of maintenance and rehabilitation of international roads would require about US\$100 million. It would help consolidate the system of bidding to private construction companies for road works and maintenance, establish cost recovery systems, and would help establish a mechanism for the rehabilitation of rural roads.
- **Restructuring the Railways.** Under the current financial conditions and institutional and organizational structure, the railways will find it difficult to compete in the future market. A corporate strategy needs to be developed and implemented. This strategy would address privatization issues, the necessary revision of the fare structure to reach cost recovery and generation of debt capacity to carry out investments, and the essential update of accounting systems. Asset management strategies also need to be formulated, including divestiture where applicable. This project would include, in addition to specific technical assistance, training of technical and management staff, and investments for rehabilitation of selected assets.

- ***Restructuring Urban Transport Services.*** Technical assistance is needed to privatize the urban transport sub-sector. In addition, investment might be necessary to renew buses and procure spare parts for the bus fleet on a continuing basis. Implementation of liberalization of fare structures to allow operation by private operators would also be necessary.
- ***Airline Rehabilitation and Fleet Renewal.*** The implementation of the legal framework recommended above would introduce autonomous commercial airline operations with participation of the private sector, and competition among local and international airlines. Investment may be required to rehabilitate, upgrade and replace the existing fleet. Once identified and evaluated, these investments and training necessary would become eligible for support under financial guarantees.
- ***Upgrading of Air Traffic Control.*** Carefully selected expenditures, now under identification with USAID support, are needed to remove the current isolation of Armenia from the main international over-flight routes and improve access.

9.36 Investments to be undertaken by the public sector over the next five years should concentrate on rehabilitating the existing infrastructure, rather than on new construction, subject to cost-benefit analysis. Investment by the World Bank would be open to co-financing by other multi- and bilateral organizations.

9.37 The Ministry of Transport has voiced great interest in investments for the Trans-Caucasus corridor. *Although its development prospects deserve careful studies, under the current situation in Armenia, it would seem advisable to postpone consideration of any substantial investments for the corridor until transit traffic is reestablished on the existing transport capacity. In so doing the Government and the international finance institutions would be concentrating their energies on the most urgent problems facing Armenia's transport sector.*

---

**ANNEX 1**

**TRANSPORT SECTOR REVIEW**

**MULTIMODAL TRANSPORT AND CONTAINERIZATION IN ARMENIA**

**PERSPECTIVES FOR CONTAINERIZED TRANSPORT IN ARMENIA**

**PRELIMINARY FINDINGS AND CONCLUSIONS**



**MULTIMODAL TRANSPORT AND CONTAINERIZATION IN ARMENIA**  
**PERSPECTIVES FOR CONTAINERISED TRANSPORT IN ARMENIA**  
**PRELIMINARY FINDINGS AND CONCLUSIONS**

**CONTENTS**

- 1. Introduction**
- 2. Definitions**
- 3. Present and future demand for containerised transport in Armenia**
- 4. Technological and physical aspects of containerisation in Armenia**
- 5. Regulatory and institutional aspects of containerisation in Armenia**
- 6. Managerial and operational aspects of containerisation in Armenia**
- 7. Some financial aspects of containerisation in Armenia**

## **PERSPECTIVES FOR CONTAINERISED TRANSPORT IN ARMENIA**

### **1. INTRODUCTION**

The development of transport of unit loads, i.e. containers, semi-trailers, swap-bodies will be of major importance for the regional integration and development of the Armenian economy. Therefore, it will be necessary to develop a combined transport network which will enable Armenia to transport containerised cargo in an efficient and effective way.

The objective of this report is:

To determine the likely evolution of regional container flows and their potential use of Armenian infrastructure and make recommendations for the development of a modern combined transport network by:

- (a) Identifying the determinants of future demand for containerised transport services, and discuss the institutional, physical, managerial, and financial adjustments required to meet that demand, in addition to modifications to the regulatory framework which may be called for.
- (b) Reviewing available data and obtaining additional information necessary to identify key pieces of legislation and institutional reform necessary and to address the restructuring of the regulatory framework.

The term 'combined transport' has in the present context been used to cover all forms of unit loads, i.e. containers, semi-trailers, swap-bodies, which moved from one mode of transport to another. Combined transport in Armenia is almost totally limited to road/rail transport.

The report will not only look at 'containerisation' as a technical loading concept, but also within the perspective of multimodal transport.

### **2. DEFINITIONS**

Recent experiences show that there exists confusion about the use of terms and concepts in the field of combined transport. Different definitions are in use, sometimes for the same type of transport, leading to misunderstandings:

**Table 1**      *General terms*

Multimodal Transport	Carriage of goods by at least two different modes
Intermodal transport	The movement of goods in one and the same loading unit or vehicle which uses successively several modes of transport without handing of the goods themselves in changing modes
Combined transport	Intermodal transport where the major part of the journey is by rail, inland waterways or sea and any initial and/or final leg carried out by road is as short as possible
Piggyback transport	Combined transport by rail and road
Rolling road	Transport of complete road vehicles on low-floor throughout wagons
Accompanied transport	Transport of complete road vehicles through an other mode of transport (for example by ferry or train) accompanied by the driver
Unaccompanied transport	Transport of road vehicles or part vehicles through an other mode of transport (for example by ferry or train) not accompanied by the driver
Roll-on-roll-off (Ro-Ro)	The facility for a road vehicle to be driven on and off a ship, or as in the case of rolling road, a train
Lift-on-lift-off (Lo-Lo)	Loading and unloading of intermodal transport units using lifting equipment
Intermodal Transport Unit (ITU)	Containers, swap bodies and semi-trailers suitable for intermodal transport
Freight village	A single site which includes a terminal, other technical and administrative facilities associated with combined transport (agents, shippers, customs,...) and accommodation for companies engaged in combined transport
Terminal	A place where a modal change takes place
Hub	Central point for the collection, sorting and distribution for a particular region or area

We will use in this report the following concept of multimodal transport:

transport and organisation of carriages of goods in one and the same loading unit which uses successively several modes of transport without handing of the goods themselves in changing modes whereby the organisation under the control and responsibility falls of one unique organiser.

### 3. PRESENT AND FUTURE DEMAND FOR CONTAINERISED TRANSPORT IN ARMENIA

3.1 The economy of Armenia is almost completely paralysed. This is partly caused by the closing of the borders with Turkey and Azerbaidjan and the problems in Abkhazia/Georgia which frustrates trade and transport between Russia and Armenia. The two railways that link Armenia with Russia go through Abkhazia and Azerbaidjan. There are also problems with the link Armenia-Iran. Only the private sector is able to use the Armenia-Iran corridor.

Estimations indicate that the export declined from 10 billion US\$ (in the mid eighties) to 263 million US\$ in 1995.

The following figures show the disastrous impact on the development of volume of freight transport:

**Figure 1** Cargo transportation Armenia 1988-1995 (in tons)  
Ministry of Transport Entities

Year	Million Tons by road	Million Tons by rail	Total road/rail	% of rail on total
1988	93.1	39.7	132.8	30
1989	39.7	41.5	81.2	51
1990	96.9	37.6	134.5	28
1991	68.8	29.1	97.9	30
1992	20.2	7.5	27.9	27
1993	3.6	2.6	6.2	42
1994		2.0		
1995		2.2		

Source: Ministry of Transport

Looking at the Figure 2 showing the totals of ton-km and combining these with the data from Figure 1, the average distance of transport by truck is 20 km and the average distance of transport by rail 150 km.

**Figure 2** Cargo Transportation in Armenia (1988-1993) in ton-km  
Ministry of Transport Entities

Year	Million ton-km road	Million ton-km rail	% of rail in total
1988	1816	4803	72.6
1989	775	5120	86.8
1990	1533	4884	76.1
1991	1140	4179	78.6
1992	264	1280	82.9
1993	68	450	86.9

Source: Ministry of Transport

The foreign trade of Armenia between 1993 and 1995 increased by more than 100% but is still insignificant:

**Figure 3** Foreign trade of Armenia in 1995 (in million US\$)

	1993	1994	1995
Total	410.4	583.4	931.9
Export	156.2	196.8	263.4
Import	254.2	386.6	668.5

Source: Ministry of Trade, Services & Tourism, 1996

The countries of the former USSR are together the main trade partners of Armenia:

**Figure 4** Foreign trade of Armenia in 1994-1995 by country

Country	Trade turnover	Export	Import
Russia	221.9	86.9	135.0
Turkmenistan	186.3	62.3	124
Iran	124.8	35	89.8
USA	115	0.6	114.4
Georgia	64.6	2.7	61.9
Belgium	46.4	30.8	15.6
Germany	21.4	10.1	11.3
France	16.5	0.2	16.3
Subtotal	833.7	229.1	604.5
TOTAL	931.9	263.4	668.5

Source: Ministry of Trade, Services & Tourism

The 124 million US\$ import from Turkmenistan consists of petroleum gases. The imported goods from the USA are for 96% from humanitarian aid (grain, milk products and pharmaceutical products). Also imported wheat from Italy is humanitarian aid (for 10.8 million US\$).

Figure 4 shows that also Iran is relatively a considerable trade partner. Products exported to Iran are ore and copper concentrates, scrap metal and scrap aluminium. Sugar and confectionery products, fats and vegetable oils are the import products.

Figure 5 shows the import and export of Armenia by mode and corridor.

**Figure 5** *Import and export flows in Armenia in 1994 (without humanitarian food aid) (in thousand tons)*

	Import			Export			Total
	Road	Rail	Sub Total	Road	Rail	Sub Total	
Corridor Achotsk	32.9		32.9	6.3		6.3	39.2
Corridor Sadakhlo	57.0	657.5	714.5	10.0	126.0	136.0	850.5
Corridor Stepanavan	11.2		11.2	2.0		2.0	13.2
Corridor Iran	139.0		139.0	26.5		26.5	165.5
Corridor Karabagh	83.0		83.0	16.0		16.0	99.0
By air			84.0			17.0	101.0
(Erevan 85%/Gyumri 15%)							
<b>Total</b>			<b>1064.6</b>			<b>203.8</b>	<b>1268.4</b>

Source: Dr. S. Karapetian, Research Institute, Armenia State Committee

- 3.2 The present degree of containerisation is almost zero. Estimates by road transport companies and forwarders in Armenia indicate an average monthly transport (import-export) of 300-400 containers.

According to information from the Armenian Railroads the maximum monthly amount of containers transported is 18. The original plans were set up to transport a volume of 500 containers per month; later these figures had to be adjusted to 200 and 30 tons per month respectively. Even that latest figure of 30 tons proved out to be not realistic.

The main corridor in use presently is Poti (Georgia) - Yerevan (Armenia). The following table summarises the traffic movements at Poti in 1995:

Figure 6 Traffic movements in Poti 1995

COMMODITIES	1000 tons	%	Countries Origin/Destination
IMPORT TOTAL	1388	100	
Bulk	697	50	
coal	4		
grain	641		
ore	2		
bauxite	50		
Oil	476	34	Georgia, Armenia
General cargo	137	10	
flour/foodstuff/sugar	115		Georgia/Armenia
meat	5		
equipment	9		Georgia/Armenia/Azerbaijan
other break bulk	9		
Containers (1000 t)	78	6	
No of units	5999		
EXPORT	389	100	
Bulk	145	37	
manganese ore	43		
copper concentrate	46		Armenia
scrap iron	36		
other	20		
Oil	146	37	
General cargo	81	22	
metal products	48		
timber	1		
fertilisers/chemicals	23		
equipment	5		
other	4		
Containers (1000 t)	17	4	Georgia/Armenia/Azerbaijan
No of units	3296		
GENERAL TONNAGE	1777	60	Georgia (excl. containers)
		22	Armenia (excl. containers)
		18	Azerbaijan (excl. containers)

## Annex 1

Page 10 of 16

The traffic in Poti declined from 4.5 million tons in 1989 to 1.1 million tons in 1992. From 1993 to 1995 the traffic increased to 1.8 million tons. Poti remains a port for oil and dry bulk, but there is a rapid containerisation process in progress: imports and export containers increased from 23,000 tons in 1992 to about 95,000 tons in 1995 (9295 TEU).

Armenia is the most important user of container transport to and from the port of Poti with 50%, about 400 containers per month.

In 1995 Armenian railways transported 158 loaded and 426 unloaded 20' feet containers, which is an average of 13 loaded and 36 unloaded containers per month.

The port of Batumi in Georgia does not have container facilities. Incidentally, there is container transport by road from Armenia to Iran. Although the border with Turkey is still officially closed, there is some passenger and informal freight transport, but no container transport by rail or road.

- 3.3 The perspectives for containerised in the future are quite limited. The first condition to be fulfilled is the opening of the borders with Turkey, Azerbaidjan and a normalisation of the relations with Iran. Also the situation of Abkhazia has to be solved before the normal trade pattern with Russia can be stabilised. The transport costs for goods to Russia through the port of Poti are rather high. It is likely that the border with Turkey will be opened by the end of this year. This would stimulate the traffic through Istanbul, but does not automatically implicate an increase in the transport volume. More likely the railways and the road transport companies and freight forwarders in Armenia will divert part of their transport from the Yerevan - Poti corridor to the Yerevan - Istanbul corridor. This applies only for a part of the trade between Europe/Turkey and Armenia (with a total trade turnover of about 120 million US\$ in 1995) and will not effect the trade between Russia and Armenia.
- 3.4 Economic development is a first condition for increasing the volume of transport. The opinion of the chairman of freight forwarder UNITRANS that the industrial sector should receive financial assistance to pay the transport costs (through a system of loans with a revolving fund character) seems not be valid. If economic development takes place, the private industrial sector will find ways to finance transport.
- 3.5 As far as the road transport sector is concerned, the old fleet of trucks is not road-worthy for international transport. There are very few transport companies in Armenia with own trucks and trailers which operate on international corridors. The freight forwarders also choose also often for Iranian, Georgian and Turkish drivers for the trips from Yerevan to Poti and Iran.

Some Armenian road transport companies are interested to operate on international corridors, but lack financing for the purchasing of new vehicles (or second-hand vehicles in good shape). They think the interest rates at the local banks are too high. But the main problem is the lack of capacity to elaborate sound business plans based on market research and feasible price-cost calculations.

Sealand has already a representative in Armenia and plans to expand its fleet of trucks and trailers step by step.

- 3.6 The Armenian Railroads are eager to pick up the container transport. They indicate that the lack of cargo is the main reason for the obsolete state of the equipment. There is no money for maintenance. They have 500-600 20' feet containers from the humanitarian aid and possibly in the near future another 1,000 containers somewhere the CIS countries. The system as been used in the FSU is still functioning. The movement of all the containers in the former FSU is still controlled by Moscow. When the containers pass the borders in the CIS states, the information is sent to Moscow where the financial administration is centralised.

In the next the future there might be enough cargo for the Railroads to start block trains on the routes

- Yerevan - Russia (through Sochi)
- Yerevan - Poti
- Yerevan - Kars - Istanbul
- Yerevan - Iran

For the time being only the corridor Yerevan - Poti could have enough cargo to justify this block train concepts. The block train concept demands as a minimum 1,000 containers per month (presently the traffic is 18 containers per month).

- 3.7 Perspectives for attracting international regional traffic from Central Asia and the Far East to Europe or from Russia to, for instance, Iran are very limited. The two main corridors are passing Armenia to the north and to the south. The TRACECA route to Europe through the Caspian and the Black Sea uses in the Caucasus the corridor Baku - Tbilisi - Poti. But also the traffic through this corridor declined dramatically from 5 million tons to about one million ton. The TRACECA South route to Europe via Turkey goes through Tejen and Saraks and the traffic is still insignificant. Lake Van in Turkey is an obstacle and the building of a rail line around the north of the lake might boost the traffic up to 4 million tons per year. However, it is possible that Armenia might attract a small percentage of this traffic through its link to Sufian in Iran. It is clear that the problems with Azerbaidjan have to be solved by then.

- 3.8 It might be clear that huge investments in containerisation in Armenia will not bring any profit.

The private road transport sector will step by step increase their share in containerised transport and supply the necessary vehicles, equipment and technology by themselves.

Armenian Railroads do still have sufficient infrastructure, rolling stock and equipment to handle the small volume of containerised freight. In 1995 the Armenian railways transported 1,500,000 tons, of which about 2,000 tons in containers (0,13%). The existing infrastructure, rolling stock and handling equipment in the present condition are able to transport and handle 5-6 million tons per year.

#### **4. TECHNOLOGICAL AND PHYSICAL ASPECTS OF CONTAINERISATION IN ARMENIA**

##### **4.1 Rail and Roads Infrastructure**

The total length of the main railway is 789.4 km (excluding the 55.6 km Meghri sector, which was part of the Azerbaidjan Railroad). The railway network in Armenia, like in other CIS countries, is a broad gauge network. For international transport to and from Turkey and Iran freight has to be unloaded on the interface points.

Maximum train weights amount up to about 3,500-3,700 t. In 1995 it was 1,000-1,050 ton on average because of frequent power cuts, reduced network voltage, small lot loading and also worn out locomotives. Maximum train length is 850 m. There is no problem to organise special multimodal trains as container trains are normally shorter and lighter than normal heavy freight trains. Armenia has single track lines, with exception of the track Yerevan-Massis which has a double track.

The Armenia Highway Project plans to rehabilitate the Armenian road network in the period 1995-1998. Main problem for Armenia are the bad road conditions in Southern Georgia, which is a constraint for international road transport between Armenia and Georgia (Poti/Batumi).

##### **4.2 The density of the terminal network in Armenia is sufficient. Armenia has 6 railway terminals with a handling equipment for 20' feet containers (two in Yerevan, Gyumri, Vakhurit, Vanadzor, Sevan). There is no need for new terminals to cover existing freight potential. The handling of 40' feet containers presents a problem.**

In the short and medium term there is no major impediment to deal with the traffic handling of 20' feet containers. However, in the long run a substantial part of the old cranes should be replaced.

##### **4.3 Armenian Railroads has 500-600 containers from the humanitarian aid, which are being used for transportation. They also have a share of 963 containers from the stock of the FSU. These containers are circulating through the CIS countries controlled by a central railroads administration on Moscow.**

The number of containers is sufficient for the containerised transport in the near future.

##### **4.4 The private road transport sector is step by step increasing its activities in container transport. An example is Armtrex, the Armenian representative of Sealand. This forwarding and transport firm has presently 4 trucks and 5 container trailers, but Sealand will supply then in the near future with another 5 container trailers.**

##### **4.6 The road track between Akhurit and the Turkish border should be rehabilitated and opened for cross border road traffic. If the Government of Armenia is not interested in this project, the involvement of the private sector should be considered.**

**5. REGULATORY AND INSTITUTIONAL ASPECTS OF CONTAINERISATION IN ARMENIA**

5.1 The creation of international legal frameworks, adherence to international multilateral conventions, establishment of bilateral agreements and streamlining of national procedures are necessary to facilitate the growth of the use of containers and their swift and cost effective movement in international trade.

5.2 In respect of international container transport, Armenia should adhere the following international agreements:

- (a) Convention on Transit Trade of Land-locked States of 1965 (New York Transit Convention);
- (b) Customs Convention on Containers (1972);
- (c) Customs Convention on the International Transport of Goods under cover of TIR Carnets (TIR Convention) of 1975
- (d) International Convention on the Harmonisation of the Frontier Control of Goods (1982).

Conclusion of transit treaties with (neighbouring) countries based on, for instance the Convention on Transit Trade of Land-locked States (New York 1965) are recommended.

5.3 It is not sufficient to ratify these conventions. In order to obtain the full benefits of containerisation, these have to be implemented and translated into national laws and procedures to make them legally enforceable instruments.

5.4 Customs clearance facilities should be provided at approved inland container terminals and at established enterprises. Containers to and from these places should be allowed to be moved by both road and rail with a minimum of restrictions in the form of guarantees and/or deposits.

5.5 Customs have to lay down clear instructions for the inland movement, handling, stuffing/de-stuffing of containers.

5.6 The private sector should be allowed to set-up and operate container terminals as common user facilities.

5.7 In order to promote containerisation it is proved very useful to develop the institution of national multi-modal operators. The Convention on International Multimodal Transport of Goods (1980) is a good guideline for the creation of national legislation in this matter.

5.8 Creating transport insurance systems is one of the priorities for Armenia in promoting containerised transport. In a privatised transport sector the problem of liability is of serious concern for the shipper and the carrier. Especially in the field of multimodal containerised transport their respective responsibilities and consequent liabilities are not always clear and assignable.

The draft Handbook for Multimodal Transport for Officials and Practitioners (UNCTAD, Geneva, 1995) may serve as a tool for adhering practices in risk allocation and insurance systems in international multimodal transport.

- 5.9 The road transport sector should be completely privatised. Also some functions of the railways should be privatised like sales and the management of operations of container terminals. The railways should, however, remain responsible for railway traction and the infrastructure network.

European Community Directive 91/440 may assist Armenian Railroads to study the possibility to separate the management of railway operations and infrastructure from the provision of railway services and the separation of the respective accounts.

- 5.10 Freedom of choice and fair competition between transport modes are fundamentals of a liberalised transport market. entrance to the market should be free for all companies, although it is good practice to regulate the transport market through a licensing system limiting itself to solvability, good repute and maybe professional competence.
- 5.11 Facilitation of containerised transport can be achieved through international co-operation. One of the most important regional co-operation organisations for Armenia is the Black Sea Economic Cooperation (BSEC).

Through BSEC market organisation of combined transport is recommended by increasing the efficiency of rail transport in general and combined transport in particular.

## **6. MANAGERIAL AND OPERATIONAL ASPECTS OF CONTAINERISATION IN ARMENIA**

- 6.1 Customers in Armenia still have to rely on their own transport to transport their freight from the railway terminal to the destination point, using their own trucks or those of a trucking company they selected and paid. The containers unloading operations is based on a very large share of transshipment via the storage area. Container terminal operations are time consuming.
- 6.2 For Armenia it is important to set up new companies for the organisation of multimodal containerised transport based on the axis management principle. Open access to the multimodal system is a prerequisite and independent operation of terminals are an important element in this. The situation of a structured network of privately operated terminals with open access to all companies is by far to be preferred above a larger number of dedicated terminals with restricted access and use.
- 6.3 The terminal operator can offer five types of services: transshipment services; load unit services; vehicle services; network services; cargo services. The feasibility for such independent operated railway terminals deserves further study including the possibility to attract private investors in necessary capital investments.
- 6.4 A international regional approach is necessary in respect of the terminals. Measures are required to
- (a) avoid uncoordinated proliferation of terminals and promoting the establishment of an efficient multimodal network;
  - (b) technical and organisational standardisation;
  - (c) qualitative minimum requirements;
  - (d) choice of location of new terminals.
- 6.5 As far as documentation is concerned for international transportation Armenia should discuss with neighbouring states the possibility of introducing the use of one single multimodal transport document in line with international standards.
- 6.6 Reorganisation of the railway tariff policy is necessary. The present tariff for all kinds of freight transportation is 8 drams (1.86 US dollar cents) per ton/km. This tariff was established on September 15, 1994.
- Specific tariffs for International Transportation Units (ITU) are recommended and dissociate container railway tariffs from the normal freight tariffs.
- Design also terminal to terminal and door-to-door tariffs.
- 6.7 It is recommended to set up an exchange or joint use (pool or reciprocity contract) of wagons (containers/wagons) exchanges by various railway networks.
- 6.8 Armenian Railroad should start to clean up their infrastructure, rolling stock and equipment and sell what it no longer needs. Further it should start according market principles.

**7. SOME FINANCIAL ASPECTS OF CONTAINERISATION IN ARMENIA**

- 7.1 The costs of container transport from and to Georgia (Poti) are extremely high. A round trip Yerevan-Poti varies between 1650 and 1700 US\$ for a 20' feet container. The distance between Yerevan is 570 km. This is almost twice the price per km comparing with the container transport to and from Iran. The Turkish truckers are even more cheaper for transport to and from Turkey: 0.5 US\$ per km. The reason for the high costs on the Georgia corridor are due to the insecure and unsafe situation in Georgia. Calculations by the World Food Programme show transport statistics in Georgia which are 15 times higher than the official ones. In Armenia, which means an enormous amount of illegal and unregistered traffic. The estimations for illegal and unregistered road transport in Armenia vary between 40 and 60 percent according to customs officials.
- 7.2 Facilitation of (container) transport on the Georgian corridor through bilateral agreements with Georgia mean savings of about 700 US\$ per transported containers (round trip). Although the present container flows are very low, even in this situation the savings can mount up to 1 million US\$ per year.
-

**ANNEX 2**

**TRANSPORT SECTOR REVIEW**

**ARMENIAN RAILWAYS**

**PROPOSED INVESTMENT PLAN**



**ARMENIAN RAILWAYS**

**PROPOSED INVESTMENT PLAN**

1. The Armenian Railways, like any other FSU railway company, is facing a situation where radical changes are inevitable. The most critical issue for the Armenian Railways is to become an independent and commercially viable entity, subject to market forces. There is almost no hope that the company's revenues and business in general will recover significantly during the coming decade without a major restructuring. Therefore, a reasonable railway reform program, based on an agreement between the Armenian Government and the Armenian Railways is urgently needed. Such an agreement would set the grounds to restructure the company, plan emergency investments and achieve the optimal cost structure and operational level to ensure the survival of the railway industry in Armenia.

2. The feasibility of emergency investments will very much depend on the successful implementation of financial adjustments and restructuring, as presented in the current report. Specific issues dealing with the elaboration of such an emergency investment plan are presented below.

3. The elaboration of any investment plan is closely related to the decision of whether to continue railway operations using electrical traction, or to favor diesel traction. This issue stems mostly from the following factors:

- electrical traction implies power supply over the entire railway infrastructure and, given current depressed traffic levels, this situation results in waste of resources and heavy, costly and inefficient operations;
- diesel locomotives would allow the Armenian Railways to be more flexible and cost-efficient;
- the Armenian nuclear power station Arshalvis, the main power supply source for the railways, is not in very good condition and cannot ensure reliable energy supply. By over-relying on electrical traction for its operations, the Armenian Railways are over-dependent on the performance of the nuclear power plant and face high energy costs in the longer term.

4. A study exploring the pros and cons of keeping electrical traction for railway operations shall be carried out in 1997. Ideally, the study would also take into account

logistical issues over the entire network of the Armenian Railways. Any decision on future investments and operations should be based on the conclusions of the study. Preliminary estimates indicate that the diesel traction option would reduce operational costs by US\$1.5 million on average over the next 7 years.

5. Particular attention should also be given to staff and organizational issues. Besides implementing a staff reduction plan, the Armenian Railways would need to hire three to four (3 - 4) young managers with Western economic and/or finance education as a matter of urgency. High compensation would need to be considered. This is absolutely necessary from a financial engineering point of view.

6. Furthermore, small scale investments should be made in information technology and computers immediately. It would probably not result in a major administration and information management change, but new thinking in a modernized working environment would be introduced. This would also initiate positive changes in middle and upper management.

7. The railway communication system can be renewed in co-operation with the overall development of the telecommunication industry and services in Armenia. Infrastructure of the Armenian Railways (masts and mast bases for radio-links, cable etc.) could be used all over the country. An independent sub-unit of the Armenian Railways, run on a commercial basis and whose task would be to develop a cross country communication system, could even be created.

8. A number of operational decisions could be suggested in order to achieve higher efficiency and control over the limited sources of the Armenian Railways:

- Damage to the track in Kuiboshevo, caused by the 1988 earthquake, is serious and renewal of the line would require a lot of investments. The Kuiboshevo line is of no strategic importance and is not commercially vital. Railway infrastructure on that line could therefore be used as a source of spare parts for other, more critical lines. Closure of the line would also contribute to downsizing efforts. The Razdan-Idzhevan line could be used instead.
- The Razdan-Zod line could be sold or rent to its almost only customer - ArmZoloto.
- Similar suggestion can be made for branches to Arshalvis (nuclear power station) and Pemzasheni. The customer companies should contribute to the costs of maintaining railway infrastructure on their lines.

- Organization of passenger and freight traffic in-and-out and around Yerevan requires a logistical study. Current organization of traffic is not efficient.
- Depots and shops on shall be reduced. All technical and maintenance needs could be covered with only one (1) depot (either in Yerevan or Kumayri) and with two to three (2 - 3) shops.

9. A railway co-operation agreement between Armenia and Georgia could be extended on operational and technical matters. Both national railway companies could distribute and share technical and other capacities in order to save costs.

10. Based on the successful implementation of the above and on railway traffic recovery as projected under the *border-opening* scenario (see Chapter III and Chapter VI, Section C), two preliminary investment plans corresponding to Armenian Railways' investment needs over the next 7 years were developed (see Table 1 for a summary, and Tables 2 and 3 for details on the proposed investment programs). They depend on whether the electrical or diesel traction option is adopted. Further assistance to the Armenian Railways would be needed to refine and update these plans.

**Table 1 -- Proposed Investment Plans for 1997-2003**

<b>INVESTMENT AREA</b>	<b>ELECTRICITY ('000 \$US)</b>	<b>% of total</b>	<b>DIESEL ('000 \$US)</b>	<b>% of total</b>
Track	47,900	63	46,000	60
Rolling Stock	19,150	25	21,550	28
Station, Depot	4,500	6	4,500	6
Communication & Information Technology	4,250	6	4,250	6
<b>TOTAL</b>	<b>75,800</b>	<b>100</b>	<b>76,300</b>	<b>100</b>



Table 3

ARMENIAN RAILWAYS -- Proposed Investment Plan -- Diesel Scenario

Total Investment Over the Period ('000 US\$): 76,300

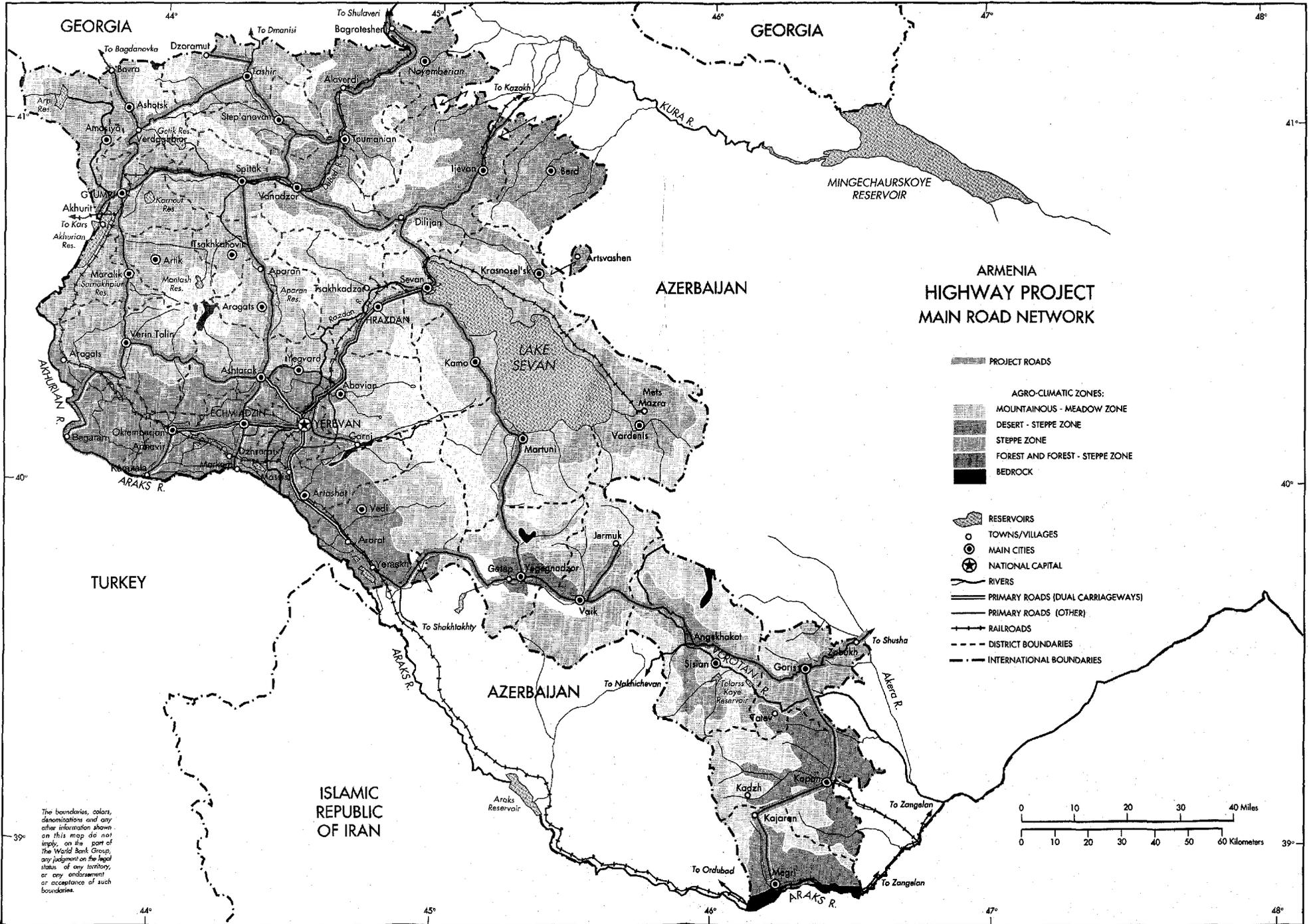
	Actual	Projected							
	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Total Investments ('000 US\$)</b>	0	0	6,210	20,250	11,750	10,210	8,960	8,960	9,960
<b>Investments for Rolling Stock ('000 US\$)</b>	0	0	210	10,250	2,250	2,210	2,210	2,210	2,210
<b>Electric Locomotives</b>									
<b>Key Assumptions</b>									
Total Number of Electric Locomotives	95	95	24	0	0	0	0	0	0
% of Locomotives to be Written-Off Fixed Assets			70%	70%					
Change in Number of Locomotives (1995=1)	1.00	1.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00
Number of Locomotives to be Repaired			0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average Repair Cost ('000 US\$ per locomotive)			50.0	55.0	60.5	66.6	71.2	75.5	80.0
Change in Unit Cost of Repairs (1997=1)			1.00	1.10	1.10	1.10	1.07	1.06	1.06
Unit Selling Price ('000 US\$ per locomotive)			75.3	81.7	90.8	99.8	106.8	113.2	120.0
Unit Purchase Price ('000 US\$ per locomotive)			2,200	2,200	2,200	2,200	2,200	2,200	2,200
<b>Repairs, Investment &amp; Divestiture Cost &amp; Revenues</b>									
Repairs ('000 US\$)			0	0	0	0	0	0	0
New Locomotives ('000 US\$)			0	0	0	0	0	0	0
Divestiture of Locomotives ('000 US\$)			1,603	588	0	0	0	0	0
<b>Diesel Locomotives</b>									
<b>Key Assumptions</b>									
Total Number of Diesel Locomotives	119	119	30	35	36	37	38	39	40
% of Locomotives to be Written-Off Fixed Assets			70%						
Change in Number of Locomotives (1995=1)	1.00	1.00	0.25	0.29	0.30	0.31	0.32	0.33	0.34
Number of Locomotives to be Repaired			2.4	5.2	4.3	2.9	2.3	2.3	2.4
Average Repair Cost ('000 US\$ per locomotive)			40.0	44.0	48.4	53.2	57.0	60.4	64.0
Change in Unit Cost of Repairs (1997=1)			1.00	1.10	1.10	1.10	1.07	1.06	1.06
Unit Selling Price ('000 US\$ per locomotive)			60.2	66.0	72.6	79.9	85.5	90.6	96.0
Unit Purchase Price ('000 US\$ per locomotive)			2,000	2,000	2,000	2,000	2,000	2,000	2,000
<b>Repairs, Investment &amp; Divestiture Cost &amp; Revenues</b>									
Repairs ('000 US\$)			95	229	208	157	129	140	153
New Locomotives ('000 US\$)			0	10,000	2,000	2,000	2,000	2,000	2,000
Divestiture of Locomotives ('000 US\$)			1,607	0	0	0	0	0	0
<b>Passenger Wagons *</b>									
<b>Key Assumptions</b>									
Total Number of Passenger Wagons	330	330	250	180	180	180	180	180	180
% of Wagons to be Written-Off Fixed Assets			75%	75%					
Change in Number of Wagons (1995=1)	1.00	1.00	0.76	0.55	0.55	0.55	0.55	0.55	0.55
Number of Wagons to be Repaired			15.0	25.0	25.0	21.5	21.7	21.5	21.5
Average Repair Cost ('000 US\$ per wagon)			3.6	4.0	4.4	4.8	5.1	5.4	5.8
Change in Unit Cost of Repairs (1997=1)			1.00	1.10	1.10	1.10	1.07	1.06	1.06
Unit Selling Price ('000 US\$ per wagon)			4.7	5.9	6.5	7.2	7.7	8.2	8.6
<b>Repairs, Investment &amp; Divestiture Cost &amp; Revenues</b>									
Repairs ('000 US\$)			54	99	109	103	111	117	124
New Wagons ('000 US\$)			0	0	0	0	0	0	0
Divestiture of Wagons ('000 US\$)			94	104	0	0	0	0	0
<b>Freight Wagons</b>									
<b>Key Assumptions</b>									
Total Number of Freight Wagons	5,236	5,236	3,900	1,800	1,800	1,800	1,800	1,800	1,800
% of Wagons to be Written-Off Fixed Assets			75%	75%					
Change in Number of Wagons (1995=1)	1.00	1.00	0.74	0.34	0.34	0.34	0.34	0.34	0.34
Number of Wagons to be Repaired			150	200	200	180	181	181	180
Average Repair Cost ('000 US\$ per wagon)			0.4	0.4	0.5	0.5	0.6	0.6	0.6
Change in Unit Cost of Repairs (1997=1)			1.00	1.10	1.10	1.10	1.07	1.06	1.06
Unit Selling Price ('000 US\$ per wagon)			0.6	0.7	0.7	0.8	0.9	0.9	1.0
<b>Repairs, Investment &amp; Divestiture Cost &amp; Revenues</b>									
Repairs ('000 US\$)			60	88	97	96	103	109	115
New Wagons ('000 US\$)			0	0	0	0	0	0	0
Divestiture of Wagons ('000 US\$)			200	347	0	0	0	0	0
<b>Other Rolling Stock Investments</b>									
Investments for Tracks ('000 US\$)			6,000	8,000	7,000	6,000	6,000	6,000	7,000
Investments for Stations and Depot ('000 US\$)					1,500	1,500	500	500	500
Investments for Training, Communications and Information Technology ('000 US\$)				2,000	1,000	500	250	250	250

\* Assuming Railway Passenger Transport Remains in Service



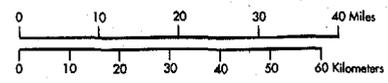
**MAP SECTION**





**ARMENIA  
HIGHWAY PROJECT  
MAIN ROAD NETWORK**

- PROJECT ROADS
- AGRO-CLIMATIC ZONES:**
  - MOUNTAINOUS - MEADOW ZONE
  - DESERT - STEPPE ZONE
  - STEPPE ZONE
  - FOREST AND FOREST - STEPPE ZONE
  - BEDROCK
- RESERVOIRS
- TOWNS/VILLAGES
- MAIN CITIES
- NATIONAL CAPITAL
- RIVERS
- PRIMARY ROADS (DUAL CARRIAGEWAYS)
- PRIMARY ROADS (OTHER)
- RAILROADS
- DISTRICT BOUNDARIES
- INTERNATIONAL BOUNDARIES



The boundaries, colors, denominations and any other information shown on this map do not imply, on the part of the World Bank Group, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries.





