PROJECT INTERIM REPORT

Project Title	:	**Joint Venture(s) for the Caucasian Railways**		
Project Number	:	TNREG 939401		
Country	:	Armenia, Azerbaijan, Georgia		
		Local operator		**EC Consultant**
Name	:	Ministry of Transport and Communication of Armenia	Republic of Azerbaijan, Cabinet of Ministers	Ministry of Transport of Georgia	TEWET GmbH
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Date of report : 15/04/97

Reporting period : 10/96 - 02/97

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1 Project Synopsis

(slightly adjusted by M&E team)

Project Title	:	**TRACECA: Joint Venture(s) for the Caucasian Railways**
Project Number	:	TNREG 939401
Countries	:	Armenia / Azerbaijan / Georgia

Project Objective(s):

- determination of those areas for which there is the possibility of cooperation between the railways of Armenia, Azerbaijan and Georgia, as well as between the railways and the ports of these countries on the Caspian Sea and the Black Sea and railway ferry lines within the scope of joint ventures;
- establishment of the legal, organizational, financial, management and marketing conditions for such joint ventures;
- preparation of joint ventures with participation of Western capital, preferably in the infrastructure area and the transport service field.

Planned Outputs:

- forecast of the development of freight and passenger traffic;
- assessment of the technical condition of the three railways, focusing on their main network, in particular on those lines serving for more than 90 per cent of the total transport performance;
- economic and financial assessment of the railways; determination of the priorities, and sequence of necessary maintenance and investment measures;
- investigations for the formation of joint ventures in the infrastructure area as well as the transport service field;
- business plans for the proposed joint ventures;
- railway staff training in modern management and marketing methods, as well as in technical procedures and standards.

Project Activities:

- **WP 1000 Railway Infrastructure Authority**
  WP 1100 (1110 - 1170) Present Condition of Network
  WP 1200 (1210 - 1240) Organizational, Legal and Financing Conditions
  WP 1300 (1310 - 1340) Establishment of International Cooperation

- **WP 2000 Business Strategy Infrastructure**
  WP 2100 (2110 - 2130) Traffic Forecast
  WP 2200 (2210 - 2260) Investment Plan for the Railway's Infrastructure
  WP 2300 (2310 - 2340) Management

- **WP 3000 Trans-Caucasian Railway Service Centre**
  WP 3100 (3110 - 3150) Present Conditions of the TCR and Deficiency Analysis
  WP 3200 (3210 - 3260) Objectives and Strategy
  WP 3300 (3310 - 3350) Foundation of a Service Company
  WP 3400 (3410 - 3450) Business Plan

- **WP 4000 Port and Ferry Service**
  WP 4100 (4110 - 4130) Present Conditions in Ports
  WP 4200 (4210 - 4230) Technical and Operational Requirements for Ferry Connections
  WP 4300 (4310 - 4340) Ferry Operation Company

Project Starting Date : 23 July 1996

Project Duration : 10 months

2 Summary of Project Progress Since the Start

On the basis of the project contents' revision in the Inception Report and the approval of the final recipients, concrete work on the project mainly started at the end of October 1996. In accordance with the Work Programme, processing focused mainly on the work packages within the work streams

1000 - Railway Infrastructure Authority

2000 - Business Strategy Infrastructure.

Emphasis in the works performed was laid on investigating the railway infrastructure in the TRACECA countries Armenia, Azerbaijan, and Georgia. In Armenia a first inventory of the present conditions was to be taken, whereas in Azerbaijan and Georgia supplementary and more in-depth investigations were needed, since for these countries first findings, which could be taken as a basis, were already available from the project "Infrastructure Maintenance 1: Railways".

The analyses performed encompassed the technical conditions, the determination of bottlenecks, and of the need for reconstruction work in the fields

- tracks and bridges
- signalling and telecommunication
- power supply
- passenger and freight stations
- rolling stock (wagons and locomotives).

Apart from the technical investigations, investigations as to the traffic forecast in passenger and goods transport, and the financial analysis of all three railways are of decisive importance to the works on a business strategy for the cooperation of the different railways within joint ventures, which works are partly done on parallel and partly to be required subsequently.

The areas suited for the possible establishment of joint ventures in the infrastructure field were determined as follows:

- production of prestressed concrete sleepers,
- reconstruction and operation of communication systems,
- repairs of locomotives or production, respectively.

Works in the work streams

3000 - Trans Caucasian Railway Service Centre

4000 - Port and Ferry Service

concentrated on analysing the organizational and legal outline conditions in the countries and railways concerned, and in the ports on the Black Sea and the Caspian Sea (Poti, Batumi, Baku).

Furthermore, existing transport rates and fares in the region and of competing transport corridors were investigated. Based on the results of the preceding project "Infrastructure Maintenance 1: Railways", preparations were made to establish a special container service, which resembles the operation of the "Trans-Caucasian Logistic Express" on the Poti-Yerevan relation.

3 Summary of Project Planning for the Remainder of the Project

Based on the analysis of actual conditions, the order of rank and precedence of the necessary repair and reconstruction works is determined, including quantification of cost. Depending on the forecast development of the railways' economical situation, main emphasis here is laid on determining the demand that can really be financed. Different versions conceivable to finance infrastructure have to be evaluated, and corresponding recommendations and conclusions have to be derived to ensure the railways' infrastructure in the short, medium, and long run.

Suggestions as to the establishment of joint ventures in the infrastructure area have to be further detailed for the above-mentioned different versions, considering in the respective investigations both joint ventures on a bilateral basis each between the railways involved, and joint ventures with a possible participation of European partners.

To ensure that the technical and technological compatibility between the railways in the Caucasus region keeps being preserved, various solutions as to joint committees on differing levels of competence and responsibility have to be developed.

On the basis of the statements and data available as to the development of transport demand, various alternatives are prepared regarding the establishment of one or more transport operating companies offering goods transport on the Caucasian land bridge. Legal, organizational, and commercial aspects have to be investigated. The objective of these investigations is, by including all parties interested (railways, ports, forwarding agents, shipping companies) to be able to offer uninterrupted, logistic services which meet customers' demands. Work here must mainly concentrate as follows:

- know-how transfer from the foreign companies and banks,
- selection of financing sources and its forms,
- development of the organization and its organigram,
- cost and revenue estimates,

- financing of financing, and
- sensitivity analysis.

A Management Study Tour to Germany for 10 representatives each of the Armenian, Azerbaijan, and Georgian Railways is envisaged for the period between 16 and 30 April, 1997. This study tour is meant to acquaint its participants with the experience DB AG (German Railways) and other enterprises working in the transport sector gained as regards cooperation, the establishment of joint enterprises, modern management methods and marketing, and to either deepen existing contacts with West European firms interested in engaging themselves in the Caucasian Railways, or to make new contacts with such firms. The findings and results from this study tour will be further deepened on occasion of a Management GRID Seminar in Georgia, also to be performed for representatives of all three railways, at the end of June.

4 Project Progress in Reporting Period

With the

1 000 - Railway Infrastructure Authority

work stream, works in the reporting period 10/96 to 02/97 focused on the analysis of the current infrastructural conditions and of the economic situation of the three Caucasian railways.

Works under WP 1100 - Present Condition of Network - concentrated on further detailing the analyses of actual conditions for the Azerbaijan and Georgian Railways as compared with the results of the TRACECA project "Infrastructure Maintenance 1: Railways and Pilot Train Baku - Poti", and Armenian Railways' actual conditions were analysed for the first time.

Thus, analyses of actual, technical conditions of the tracks, of bridges, of signalling and communication, of power supply, of stations, and of rolling stock are available. Investigations regarding the stations were a first-time event in all three countries, since they had not been part of the preceding project.

During the investigations special attention was paid to those work streams concerned with determining the joint ventures. Possible locations for the production of prestressed concrete sleepers were, for instance, investigated and the extent to which local resources might be possibly used was analysed, assuming that the portion of locally available, basic material would be raised to a maximum to ensure highest efficiency of such a production.

First results, however, yielded that cement and concrete steel are not that easily available in the quality required. Selection and possible local production of an appropriate fixing system need also to be further investigated.

As regards a telecommunication joint venture, supplementary investigations on the existing switching and transmission technology were performed. With a view to the further development of container traffic and the possible establishment of an operating company, the terminals of multimodal transport were made the focal points of the investigation in the "stations" complex. "Rolling stock", finally, was checked as to the technical preconditions for a cooperation, in particular with regard to the general inspection and construction of locomotives.

With respect to the organizational, legal, and financing conditions, results are available on the present organization, the legal and institutional organization, and on the financial analysis for the countries or railways, respectively, of Armenia, Azerbaijan, and Georgia. The analysis of the legal aspects shows that the juridical situation of the three railways is influenced by the following circumstances:

- The FSU rules on the construction and operation of railways, and the international railway conventions of OSShD continue to be valid.
- National regulations as to the legal status, organization, management, and financing of the railways are being created.
- Certain regulations of FSU ceased to be valid without being duly replaced (e.g. on seaports).
- As a result of the new sovereignty, rules have been introduced for objects of legislation not yet necessary (e.g. border controls, customs).

That means: The legislation is in a state of flux. Influence should be exerted upon its further development.

A legal unity for the three Caucasian railways is still in existence. It is increasingly challenged, however, by national laws being created that have precedence over uniform law.

The problem is well being recognized in the Caucasus region: governments and railway administrations take care to maintain the uniform rules, or to at least only modify them by mutual agreement.

The analysis of the three railways' financial situation was mainly based on data of 1995, and resulted in that the methods used for recording and accounting of cost were strongly influenced by the system from Soviet times, and that the balance sheets do not reflect the reality of the financial situation. In particular the problem of realistically evaluating fixed assets and depreciations, and the unrealistic figures regarding expenditures for maintenance lead to a distorted picture of the financial situation.

To receive a realistic picture comparable with European balance sheet regulations, extensive conversions and modifications in the entire accounting system will be required.

Cost accounting has to be modernized in a way to make transparent the actual costs of cost centres, and that of the production by product type. It should also be designed in a way to enable correct decisions as regards the setting of prices, the envisaged production programme and - by complementary model calculations - the necessary investments, and also the contracting out or even the closing down of certain railway lines, stations or other parts of the enterprise. However, cost accounting has to remain simple, at least in its initial phase.

When introducing the necessary changes, those existing accounting and planning organizations, where cost centre accounting and budgeting are functioning, will have to be utilized to their maximum in order to make the changes acceptable. The participation of the accountants and economists available locally is indispensable.

Especially important to the project as a whole are the investigations performed in work stream 2000 on the forecast of future passenger and goods transport volumes.. Work on WP 2200 had to take into account that the Consultant within the scope of the TRACECA project "Pre-investment Study and Pilot Train Baku - Tbilisi - Batumi/Poti" had already made a forecast of the development of the Azerbaijan and Georgian Railways' goods transport. The necessary detailed description of the initial situation in Azerbaijan and Georgia could therefore be dispensed with.

This applies especially to the analysis of the macroeconomic situation, the development of foreign trade, and the current situation in rail freight traffic of these countries. The investigations on the traffic forecast focused on:

- forecast of the development of the Armenian Railways freight traffic;
- forecast of the freight volume in important transport corridors of all three countries;
- development of transport volumes for selected main types of goods;
- in-depth investigations on the oil production and oil-processing sector;
- in-depth investigations on the development of competing modes of transport and transport corridors;
- forecast of the development of passenger traffic of the three railways as a whole, and on the main lines.

The already difficult task of predicting traffic development under the currently extremely complicated political and economic conditions was rendered even more difficult by the fragmentary statistical starting data provided. The data made available on rail traffic on specific transport relations were especially meagre. There are scarcely reliable data on road traffic in the three countries. Data provided usually comprise only the state sector, whose significance is dwindling more and more. Statistical

material made available is not always reliable. And it varies considerably from country to country as to its scope and structure.

The circumstances just described with regard to statistical details led to that a great number of different sources (e.g. customs, foreign trade, ports, selected transport companies, forwarders) had to be utilized. In many cases, the existing statistical data had to be supplemented or specified by own assumptions and calculations.

Since forecast investigations are part of many TRACECA projects, works were widely co-ordinated and data exchanged with the project teams concerned. Though the forecast data of the individual projects deviate in a few details, the general trend shows a high degree of correspondence: there is a growth potential in railway transport that allows medium-term multiplication of the present, extremely low transport volumes without, however, being able to reach the volumes of the 80s.

Within the work stream

3 000 - Trans-Caucasian Railway Service Centre

the members of the project team studied the present conditions of freight and passenger transport, rates and fares, user charges and revenues in local and international traffic. In cooperation with experts of the three railways and other local experts necessary data were collected, and the main directions into which operation of freight and passenger transport would develop were determined. The practical experience gained in the organization and operation of the Caucasian Logistic Express demonstrated the importance of marketing, and of the close cooperation of all responsible organizations. On the basis of the recommendations resulting from a meeting between AGZD and GRZD (January 1997) the project team discussed the different forms of potential joint ventures and establishing operating companies (service centre). For the Poti - Yerevan connection via Tbilisi the timetable for a new Logistics Express was agreed upon, this train to be managed by a second service centre (in Georgia or Armenia).

A method to evaluate different strategies and select optimal solutions was developed.

Within the work stream

4000 - Port and Ferry Service

focal points of the interfaces between railway transport and ship or ferry transport prior to or after railway transport were investigated. In the ports of Baku, Poti, and Batumi the presently available technology and the co-ordination between port and railway was investigated, and areas showing deficits were pointed out. It was the aim of these investigations to find out the ports' ability to presently and in future fulfil their

tasks within the multimodal transport chain, and which modifications will be required to improve the co-ordination of all parties involved.

Major areas showing deficits were identified to be:

- legal and institutional problems,
- management, organizational and structural problems,
- operational and technical problems.

First attempts to overcome these deficits were submitted for the three ports investigated.

PROJECT PROGRESS REPORT

Project title : Joint Venture(s) for the Caucasian Railways	Project number : TNREG 939401	Country : Armenia/ Azerbaijan / Georgia	Page :1
Planning period : 10/96 - 02/97	Prepared on : 15/04/97	EC Consultant : TEWET Transport East West Expert Team GmbH, Berlin	
Project objectives : Promoting the establishment of cooperation between the Caucasian railways and the creation of joint ventures for infrastructure rehabilitation and train operation services			

No	ACTIVITIES IMPLEMENTED	TIME FRAME 1996/97 Months							INPUTS							
									PERSONNEL EC CONSULTANT		COUNTERPART		EQUIPMENT AND MATERIAL		OTHER	
		8	9	10	11	12	1	2	Planned[1]	Utilised[2]	Planned[1]	Utilised[2]	Planned	Utilised	Planned[1]	Utilised[2]
001/2	Project management/document.	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	14,0 MM	21,0 MM	2,0 MM	2,5 MM			8 flights/ 140 DSA	17 flights/ 151 DSA
1100	Present condition of network				XXXX	XXXX		XXXX	6,9 MM	4,8 MM	8,5 MM	7,0 MM			8 / 140	6 / 94
1200	Organ., legal, financ. cond.				XX	XXX	XX	XX	3,6 MM	1,8 MM	6,0 MM	4,0 MM			6 / 70	3 / 38
1300	Establishm. of intern. coop.						XXXX		2,0 MM	1,6 MM	1,5 MM	1,2 MM			8 / 40	2 / 25
2100	Traffic forecast			XX	XXXX	XX	XX	XX	3,1 MM	3,1 MM	4,5 MM	4,5 MM			2 / 70	2 / 56
2200	Investment plan for infrastr.						XX	XXXX	6,4 MM	4,2 MM	3,0 MM	2,0 MM			6 / 120	2 / 83
2300	Management								0,7 MM						1 / 15	0 / 0
3100	Present condition of TCR				XX	XXXX			2,6 MM	1,8 MM	4,5 MM	3,6 MM			4 / 50	1 / 27
3200	Objectives and strategy					XX	XXXX	XX	3,2 MM	2,8 MM	3,6 MM	3,0 MM			3 / 55	1 / 31
3300	Foundation of service comp.						X	XX	1,3 MM	0,8 MM					1 / 27	0 /22
4100	Present conditions in ports				XX	XX			0,9 MM	0,9 MM	1,2 MM	1,2 MM			2 / 35	2 /34
4200	Requirem. for ferry connection							XX	0,7 MM	0,4 MM	1,2 MM	0,8 MM				
4300	Ferry operation company							X	0,3 MM	0,1 MM						
							TOTAL		**45,7 MM**	**43,3 MM**	**36,0 MM**	**29,8 MM**			**49 / 762**	**36 / 561**

[1] planned for the period 08/96 - 01/97
[2] utilised in the period 08/96 - 02/97

RESOURCE UTILISATION REPORT

Project title : Joint Venture(s) for the Caucasian Railways	Project number : TNREG 939401	Country : Armenia / Azerbaijan / Georgia	Page : 1
Planning period : 10/96 - 02/97	Prepared on : 15/04/97	EC Consultant : TEWET Transport East West Expert Team GmbH, Berlin	
Project objectives : Promoting the establishment of cooperation between the Caucasian railways and the creation of joint ventures for infrastructure rehabilitation and train operation services			

RESOURCES/INPUTS	TOTAL PLANNED		PERIOD PLANNED		PERIOD REALISED		TOTAL REALISED		AVAILABLE FOR REMAINDER	
PERSONNEL **Short term experts:**	**EC**	**locals**	**EC**	**locals**	**EC**	**locals**	**EC**	**locals**	**EC**	**locals**
001 / 2	42,0	4,0	14,0	2,0	21,0	2,5	21,0	2,5	21,0	1,5
1100	6,9	8,5	6,9	8,5	4,8	7,0	4,8	7,0	2,1	1,5
1200	3,6	6,0	3,6	6,2	1,8	4,0	1,8	4,0	1,8	2,0
1300	2,9	1,5	2,0	1,5	1,6	1,2	1,6	1,2	1,3	0,3
2100	3,1	4,5	3,1	4,5	3,1	4,5	3,1	4,5	0,0	0,0
2200	7,2	3,0	6,4	3,0	4,2	2,0	4,2	2,0	3,0	1,0
2300	3,8	1,5	0,7						3,8	1,5
3100	2,6	4,5	2,6	4,5	1,8	3,6	1,8	3,6	0,8	0,9
3200	3.8	3,6	3,2	3,6	2,8	3,0	2,8	3,0	1,0	0,6
3300	6,2	2,4	1,3		0,8		0,8		5,4	2,4
3400	2,6	1,1							2,6	1,1
4100	0,9	1,2	0,9	1,2	0,9	1,2	0,9	1,2	0,0	0,0
4200	0,7	1,2	0,7	1,2	0,4	0,8	0,4	0,8	0,3	0,4
4300	0,7		0,3		0,3		0,3		0,6	
Sub-total	**87,0**	**43,0**	**45,7**	**36,0**	**43,3**	**29,8**	**43,3**	**29,8**	**46,7**	**13,2**
EQUIPMENT AND MATERIAL										
Sub-total										
OTHER INPUTS										
Sub-total										
TOTAL	**87,0**	**43,0**	**45,7**	**36,0**	**43,3**	**29,8**	**43,3**	**29,8**	**46,7**	**13,2**

OUTPUT PERFORMANCE REPORT

Project title : Joint Venture(s) for the Caucasian Railways	Project nr : TNREG 939401	Country : Armenia / Azerbaijan / Georgia	Page : 1
Prepared on : 15/04/97		EC Consultant: TEWET Transport East West Expert Team GmbH, Berlin	

Output results	Deviation original plan + or - %	Reason for deviation	Comment on constrains & assumptions
• Prognosis of freight and passenger traffic volumes for the next 20 years with special attention to the development of transit traffic flows and other competitive transport corridors	± 0	Extension of traffic volume forecast on the whole network of all three railways; inclusion of Central Asian republics and competitive transport corridors;	Because of the lack of enough detailed statistical data, especially for road transport, there was a need to use own assumptions and calculations. These data have been agreed and harmonised with different experts in the countries concerned, and data have been exchanged with other TRACECA-project teams
• assessment of the technical condition of the three railways, focusing on their main network	- 5 %	there is a lack of information on the technical situation of railway lines at present not operated by the respective national railway companies (Abkhasia, Nakhichevan)	the mentioned lines / sections are of special importance for passenger and goods traffic after solving the political problems
• investigations for the formation of joint ventures in the infrastructure area	+ 10 %	there is a need for deepened investigations concerning the possible location of a concrete sleeper factory and the possibilities of using local resources for this production (cement, prestressing steel, fastenings etc.)	the use of local resources is of great importance for the decision about the location and in the end also about the realisation of this proposal in general
• investigations for the formation of joint ventures in the transport service area	+ 10 %	Preparation of a new Logistics Express running between Poti and Yerevan,	big container traffic flows to and from Armenia give the opportunity to introduce a new railways' service offer, problems concerning the tariff level and customs procedures have to be agreed with the Georgian side

5 Project Planning for the next Reporting Period

The participation in a Management Study Tour to Germany is scheduled for 10 representatives each of the Armenian, Azerbaijan and Georgian Railways, for the period between 16 and 30 April, 1997. Based on the findings of the previous project work in such essential areas as the imparting of experience and the transfer of know-how, the following complexes will constitute the focus of the study tour:

- organizational and structural reform of "Deutsche Bahn AG" (DB AG);
- market position of the railways on a liberalized transport market;
- legal and social problems of the railways;
- cooperation between European railways;
- market work / cooperation with customers / establishment of Joint Ventures;
- organization and implementation of maintenance and construction of tracks, wagons and engines;
- foundation of affiliated companies / outsourcing;
- organization and technical solutions for multimodal transport.

The findings of the study tour shall again be discussed and deepened on occasion of a training course for participants from all three countries, to take place in Georgia in June. This course will be based on the internationally acknowledged managerial and sales GRID technique.

This training course is to impart to its participants the necessary experience enabling them to improve their abilities and knowledge in the fields

- management and organization;
- team work and management of teams;
- settling of conflicts;
- sociological and communication problems.

Work on WP 1000/2000 is being continued as follows:

Infrastructural investigations on

- tracks and bridges,
- signalling and telecommunication,
- power supply,
- stations,
- rolling stock

will be continued for the main lines of all three railways.

Subsequently, the necessary repairs, replacements, and reconstruction works classified as to their order of rank and precedence, and including cost evaluation, will be determined on the basis of the available traffic forecast results. This work must not aim at reconstructing the original situation which was based on different transport volumes, but it must proceed from the infrastructure being adapted to the foreseeable development of transport flows (in terms of quantity and quality) in passenger and goods transport.

Various options regarding the financing and ownerships will be considered, and for each component an optimal financing structure will be determined, depending on its being suited for commercial loans and private participation. Build Operate Transfer (BOT), Build Operate Lease Transfer (BOLT), Build Operate Train Transfer (BOTT) and similar schemes will also be considered where technological and management know-how have to be transferred during an initial phase.

The investigations in preparation of bases for deciding on the establishment of joint ventures in the infrastructure area have to be continued and completed for the fields

- production of prestressed concrete sleepers;
- production and operation of a modern communication system;
- repair and/or construction of d.c. electric locomotives or asynchronous, electric locomotives.

Regional co-operation here must be a bilateral one, i.e. Azerbaijan/Georgia, respectively Georgia/Armenia.

Apart from organizational and legal aspects, the financing and the financing of financing of such joint ventures must be investigated in more detail, followed by appropriate suggestions.

The possibilities, stages, and competences of a committee co-ordinating the infrastructure of the Caucasus region railways have to be investigated, and corresponding suggestions have to be derived. To be included in these investigations are clear statements as to how binding - depending on the individual issue - activities of and determinations by this committee shall be. The integration of the three railways into existing regional and international committees in the technical and technological co-operation field like, for instance:

- Council for Railway Transport of the CIS States
- OSShD
- UIC
- ECE / ITC

must also be taken into account.

Work on WP 3000/4000 is being continued as follows:

After analysing the present conditions of freight, multimodal, and passenger transport and the forecast of freight and passenger traffic, the work will focus on the objectives of and the strategy for goods transport. Taking into account the results of the investment plan for developing the infrastructure for the railways, ports, ferry and container terminals, new products of freight transport (transport from door to door) will be developed. The Poti - Yerevan Logistic Express will remain in the centre of this work. Tariffs, timetables and an organizational scheme for the cooperation between forwarders, railways, ports and shipping companies will be prepared.

In order to improve the Joint Venture's organization, based on how this at present is handled (organizations) the next step will focus on a deficiency analysis of all organizations which in future will cooperate with the operating company.

As regards the Joint Venture, the main objective is the preparation of an operating company for handling containers and high quality goods. On the basis of the legal conditions in the three countries, the evaluation of the ownership strategies and the results of the discussions with the different possible partners of operating companies, the evaluation and selection of the participants of such Joint Ventures will be carried out. Considering the political situation, it seems necessary to have separate Georgian - Armenian and Georgian - Azerbaijan companies.

Proceeding from the present conditions of the Baku-Turkmenbashi ferry connection, a special ferry-operating company for this connection does not make sense.

The preparatory works for a business plan for the operating company concentrates on the following:

- development of organization and organigram;
- definition of staff to be needed;
- technical requirements;
- ownership strategies;
- selection of financing sources and its forms;
- cost and revenue estimate;
- refinancing;
- sensitivity analysis:

It is especially the financial aspects in the establishment of an operating company as a "Service Centre" that requires special investigation.

As for the infrastructure part, the financing model for the different "Service Centre" components will be based on the cost and revenue tables of WP 1240. In this model, the traffic forecast and the investment plan with all corresponding costs will be integrated.

The first step in preparing financing proposals will be to quickly carry out feasibility studies for all components, with cash flows and statements on their profitability.

The search for financing sources will then be the second step. Maximum private financing will be aimed at; soft loans from specialized bilateral and multilateral institutions, however, will also be integrated.

It is then possible to study financing variants and to carry out corresponding sensitivity analyses as requested in order to arrive at optimal financing proposals.

As for the infrastructure part of the study, legislative aspects will be taken into account. Particular attention will be paid to the governments' incentives for new investments and for attracting foreign capital.

Investigations with respect to port and ferry services will be continued with the intention to determine to which extent and how ports and ferry line(s) will participate and be integrated in the operating company. With a view to the envisaged expansion of the service offer across the Caspian Sea to the TRACECA states of Central Asia, great importance must be attributed to organizing the co-operation of all parties involved in the uninterrupted transport chain. Taking as a basis the investigations and suggestions from other port improvement projects, particularly questions concerning

- transfer and storage capacities to be required,
- track and shunting capacities,
- the harmonization of information and documentation systems

will be investigated in more detail, and appropriate suggestions will be derived.

PLAN OF OPERATIONS FOR THE NEXT PERIOD (Work programme)

Project title : Joint Venture(s) for the Caucasian Railways	Project number : TNREG 939401	Country : Armenia , Azerbaijan, Georgia	Page :1
Planning period : 03/97 - 07/97	Prepared on : 15/04/97	EC Consultant : TEWET Transport East West Expert Team GmbH, Berlin	

Project objectives : Promoting the establishment of cooperation between the Trans-Caucasian railways and the creation of Joint Ventures for infrastructure rehabilitation and train operation services

		TIME FRAME 1997 (months)						INPUTS			
								PERSONNEL		EQUIPMENT AND MATERIAL	OTHER
No	ACTIVITIES	March	April	May	June	July		EC Consultant	Counterpart		flights / DSA
001/2	Proj. management/documentation	X.....	....	....	....	X		21,0 MM	1,5 MM		15 / 145
1100	**Present condition of network**										
1110	Technical conditions of track	XX						0,3 MM	0,5 MM		1 / 10
1120	Technical conditions of bridges										
1130	Signalling and communication	X						0,1 MM	0,2 MM		1 / 4
1140	Power supply										
1150	Technical condition of stations	XX						0,2 MM	0,5 MM		0 / 7
1160	Maintenance technology rolling stock										
1170	Deficiency Analysis and rehab. plan	XXXX	XXXX XXXX					1,5 MM	0,3 MM		0 / 20
1200	**Organisational, legal, financ. cond.**										
1210	Analysis of present organisation	XXX						0,4 MM	0,8 MM		1 / 12
1220	Financial analysis										
1230	Legal and institutional organisation	X XX						0,4 MM	1,0 MM		1 / 12
1240	Deficiency analysis and rehab. plan	XXXX	XXXX					1,0 MM	0,2 MM		0 / 20
1300	**Establishm. of internat. cooper.**										
1310	Definition of main aims of cooper.										
1320	Alternative forms of cooperation	XXX						0,4 MM			1 / 12
1330	Requirements of intern. agreements	XXX						0,4 MM			0 / 10
1340	Border control and customs proced.			XXXX				0,5 MM	0,3 MM		1 / 15

PLAN OF OPERATIONS FOR THE NEXT PERIOD (Work programme)

Project title : Joint Venture for the Trans-Caucasian Railway	Project number : TNREG 939401	Country : Azerbaijan, Georgia, Armenia	Page :2
Planning period : 03/97 -07/97	Prepared on : 15/04/97	EC Consultant : TEWET Transport East West Expert Team GmbH, Berlin	

Project objectives : Promoting the establishment of cooperation between the Trans-Caucasian railways and the creation of Joint Ventures for infrastructure rehabilitation and train operation services

		TIME FRAME 1997 (months)						INPUTS			
								PERSONNEL		EQUIPMENT AND MATERIAL	OTHER
No	ACTIVITIES	March	April	May	June	July		EC Consultant	Counterpart		flights / DSA
2200	**Investment plan for railway infrastr.**										
2210	Track	XXX						0,4 MM			0 / 10
2220	Freight and passenger stations	XX						0,3 MM			1 / 8
2230	Signalling, communication, data proc.	XXX						0,4 MM	0,3 MM		0 / 10
2240	Power supply	XX						0,3 MM			
2250	Maintenance shop	XXX						0,4 MM	0,2 MM		0 / 10
2260	Economical assessment	XXXX	XXXX XX					1,2 MM	0,5 MM		2 / 22
2300	**Management**										
2310	Development of organisation	XXXX XX						0,7 MM	0,5 MM		2 / 18
2320	Model for financing of infrastructure	XXXX	XXXX XX					1,2 MM			2 / 15
2330	Financing sources		X XX XXXX	XX				1,1 MM			1 / 12
2340	Human resources management		XX	XXX	XX			0,8 MM	1,0 MM	teaching materials	15 flights/210 p.d. trainees
3100	**Present conditions of TCR**										
3110	Freight transport										
3120	Passenger transport										
3130	Combined or multimodal transport	XXX	XXX					0,8 MM	0,9 MM		1 / 15
3140	Tariffs, user charges, revenues										
3150	Conditions/tariffs for road/ship transp.										

PLAN OF OPERATIONS FOR THE NEXT PERIOD (Work programme)

Project title : Joint Venture for the Trans-Caucasian Railway	Project number : TNREG 939401	Country : Azerbaijan, Georgia, Armenia	Page :3
Planning period : 03/97 - 07/97	Prepared on : 20/09/96	EC Consultant : TEWET Transport East West Expert Team GmbH, Berlin	
Project objectives : Promoting the establishment of cooperation between the Trans-Caucasian railways and the creation of Joint Ventures for infrastructure rehabilitation and train operation services			

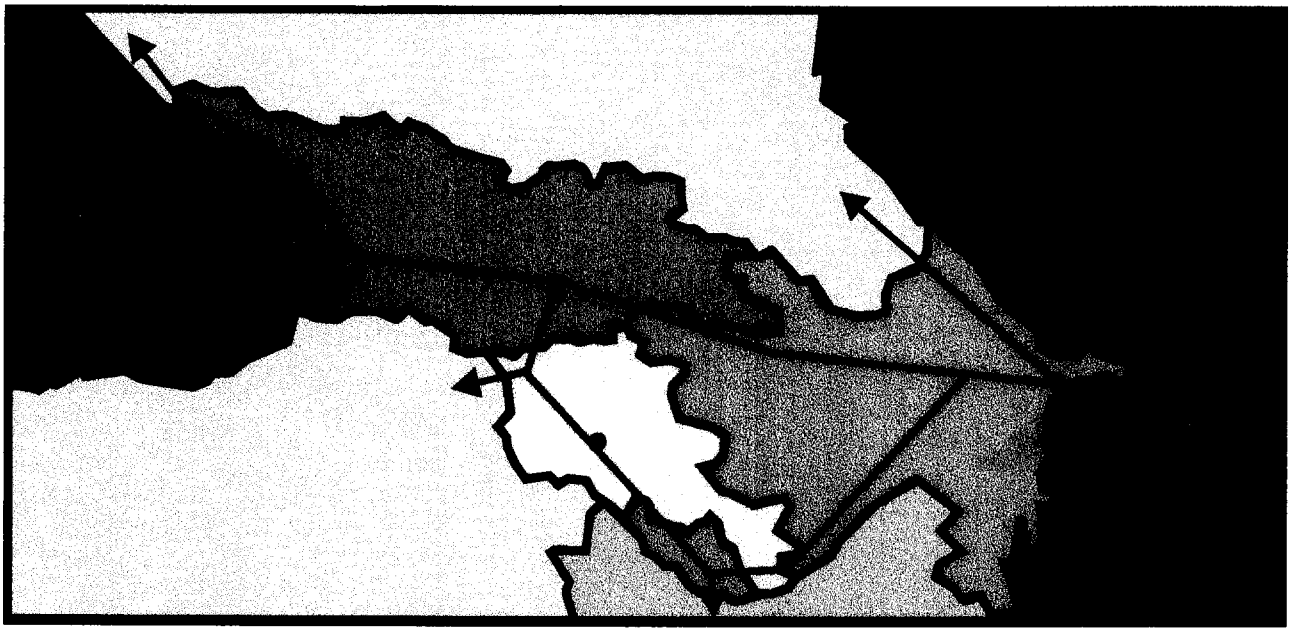
		TIME FRAME 1997 (months)						INPUTS			
								PERSONNEL		EQUIPMENT & MATERIAL	OTHER
No	ACTIVITIES	March	April	May	June	July		EC Consultant	Counterpart		flights / DSA
3200	**Objectives and strategy**										
3210	Freight market analysis										
3220	Passenger market analysis										
3230	Operation	XXXX						0, 5 MM	0,3 MM		0 / 15
3240	Locomotive and wagon service										
3250	Information service										
3260	Sales strategy, tariffs and marketing			XXXX				0, 5 MM	0,3 MM		1 / 12
3300	**Foundation of a service company**										
3310	Legal and institutional framework	XXXX XX						0,7 MM	1,0 MM		2 / 20
3320	Eval. of manag./ownership strategies	XX XXXX						0,8 MM	0,4 MM		0 / 15
3330	Objectives/organ. structure		XXXX XXXX	XX				1,3 MM			1 / 25
3340	Sources of financing			XX XXXX				0,7 MM			0 / 15
3350	Human resources management		XXXX	XXXX XXX	XXXX			1,9 MM	1,0 MM	teaching material	15 flights/210 p.d. trainees
3400	**Business plan**										
3410	Financing institution	X	XXX					0,5 MM			0 / 10
3420	Cost and revenue estimates	XXXX XXX						0,8 MM	0,6 MM		1 / 18
3430	Organisational plan		X XXX					0,5 MM	0,5 MM		0 / 10
3440	Financial evaluation			XXXX				0,5 MM			1 / 10
3450	Sensitivity analysis			XX				0,3 MM			0 / 5
4000	**Port and ferry service**										
4100	Present conditions in ports										
4200	Techn./oper. requirem. for ferry conn.	XX	X					0,3 MM	0,4 MM		0 / 5
4300	Ferry operation company	XXXX						0,6 MM			0 / 5
						TOTAL		**43,7 MM**	**13,2 MM**		**36 flights 556 DSA (30 flights, 420 per diem trainees)**

COMMISSION OF THE EUROPEAN UNION

Directorate General IA External Relations
DG IA/E/6 TACIS

Technical Assistance to the Southern Republics of the CIS
and Georgia - TRACECA
(TNREG 939401)

Joint Venture(s) for the Caucasian Railways



INTERIM REPORT

Volume I

April 1997

TEWET

TRANSPORT EAST WEST EXPERT TEAM GMBH

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1 Railway Infrastructure

1.1 Present condition of railway network

The present condition of the railway network of Armenia, Azerbaijan and Georgia involving a total track length of approx. 3800 km is the result of stagnation and breakdown of the Soviet Union.

Already more than 100 years ago the railway came into being in this region when in 1872 (in 1865 routing and beginning of construction) the first line from Russia to Tbilisi was put into operation. In 1883 it was connected with Baku. In 1895 the construction of the Tbilisi- Alexandropol (today Gyumri) - Kars (today situated in Turkey) line was started which was extended to Yerevan in 1902.

In the years after World War II these railways received a fresh impetus as regards equipment and technology owing to comprehensive investment having been made in the course of which a superstructure type for the operation of heavy goods trains of goods traffic was laid, the capacity of the routes was increased by electrification and conversion to automatic or semiautomatic section blocks, the adoption of electric interlocking cabins and use of powerful vehicles in goods and passenger traffic. Since about 10 years a period of stagnation of technical innovation and neglecting of the state of preservation began, owing to financial funds and material means lacking. This development aggravated extremely after the breakdown of the Soviet Union resulting in a lamentable state of railway premises and rolling stock which the consultants found here and which has to be overcome in the next few years if these railways will fulfil their appropriate role in the TRACECA transport corridor in future.

The outcome of the analyses of the deficit of system components of the railway network presented hereinafter are the result of a close cooperation with the managing staff of the Armenian, Azerbaijan and Georgian Railways. The experts of the EU informed themselves by visual inspection on the technical state of the plants and vehicles in situ thus becoming, at the same time, familiarised with the problems faced by the lower management level.

In the course of this analytical activity intensive working contacts were established to TACIS Coordinating Units and the TRACECA Coordinator Caucasus.

In addition, special importance was attached to the contacts established to TRACECA projects which, as to their contents, are connected with the subject dealt with, among them the following projects:

- Forwarding - Multi-modal transport systems
- Infrastructure maintenance 1 - Railways: Pre-investment study and pilot train Baku - Tbilisi - Batumi / Poti
- Rolling stock maintenance - Railways
- Transport legal and regulatory framework

The object of the investigations relating to the present condition of the network was a deficit analysis where, in a next stage of work, the investment plan for the railway infrastructure is to be derived from.

The investigations of the present conditions of the network were carried out for the track, bridges, signalling and communication, power supply, stations and rolling stock areas. Hereinafter information on the results available so far will be presented.

1.1.1 Technical condition of track and bridges

The reporting is restricted to the technical conditions of the Armenian railway premises as respective data relating to Azerbaijan and Georgia have been already presented in the Progress Report of the TRACECA project „Pre-investment study and pilot train Baku - Tbilisi - Poti/Batumi".

1.1.1.1 Total routes

The whole network of the Armenian Railway (ARM) comprises 798 km of tracks and, except the Yerevan-Masis section, consists of single tracks, is electrified with 3.3 kV DC. The whole railway network is represented and listed in the table hereinafter. This table gives information on the line sections, line kilometres - as far as they were available - the individual length of the lines which corresponds to the operational line and makes a distinction between double track and single track lines.

Tab. 1.1-1: Survey of all operational lines of ARM

line section from	line section up to	from km	to km	length km	remarks
Yerevan	Masis	2877	2863	14	double track
Masis	Gyumri	2863	2723	140	single track
Gyumri	Ayrum	2723	2579	144	single track till border point Georgia
Masis	Yeraskh	595	542	53	single track
Masis	Nurnus	16+38	-	54	single track
Nurnus	Sod	33	205	172	single track
Hrazdan - Ijevan-	Barchudarli	128	28	100	single track till border point Azerbaijan
Yerevan-Abovian-	Nurnus	1	33	33	single track
Armavir	Arshalojs	1	14	14	single track
Gyumri-Artig-	Maralik	1	38	38	single track
Gyumri	Akhurian	1	13	13	single track
Ani	Ani-Pemsa	1	5	5	single track
Noragavid -Kjamir	Blur	0	6	6	single track
Noragavid	Yerevan	2871	2877	7	single track
Masis	Nor - Hadshun-Abovian			5	reversing triangle
Operational length				798	

The above table contains all operational lines of ARM within the Armenian borders with a total track length of 798 km. According to the information given by the general

management there are in addition 450 km of station tracks and 400 km of branch tracks. As in Azerbaijan and Georgia the track construction corresponds to the Russian system, i.e. R 65 rail section (333 km) on reinforced concrete and timber sleepers with the usual rail fastening which does not correspond to the Western standard. On side tracks and passing sidings rails of the R50 rail section and, rarely of the R43 section, have been laid, namely:

R 50 = 435 km
R 43 = 21 km

The number of the installed reinforced or timber sleepers results from the 60 % : 40% ratio = 727 776 concrete sleepers and 485 184 timber sleepers.

The buildings and the remaining structures such as platforms, loading plants and other facilities of intermediate stations and operating control points on the main lines have to be restored, on a large scale. A list of stations involving data relating to engineering facilities was requested, but has not yet been handed over. The above-mentioned defects could be seen on a route inspection ride to Gyumri. In this connection, there could be stated that the passing sidings of the single track main line have to be replaced. Crossovers to and from the continuous main tracks have been equipped with points of the R65 type 1:11, of the R50 type 1:9 on the side tracks. Further information has to be gathered during the next visit.

1.1.1.2 Track geometry

According to the information the track geometry can be characterised as follows:

- gauge = 1 520 mm, minimum = 1 516 mm, maximum = 1 540 mm
- track distance at the stations = 5.30 m
- track distance on the double track section = 4.10 m
- highest superelevation = 150 mm
- radius of the levelling curve still to be given
- minimum radius at the stations and on the open line = 250 m
- branch tracks connected with R = 120 - 80 m, operation by short locomotives of the CM 3 and DGM 4 types
- maximum gradient = $38^0/_{00}$
- radiuses on steep routes = 200 m, in the mountain region there come approx. 25 curves with R = 200 m on 4 km.
  The curves are connected by straights. They are to be found between:
  Ayrum - Gyumri
  Hrazdan - Ijevan
  Sevan - Vardenis

Without giving the respective line kilometres the line speeds permissible for the time being are given with 40, 50 and 70 km/h.

Between Aragatz - Masis, Aragatz - Gyumri the permissible speed of V = 100 km/h was reduced to 70 km/h for passenger and goods trains. Before adopting a speed limit goods trains were going at a speed of 80 km/h on this line section. Between Gyumri and Ayrum the permissible speed V was fixed with 60 km/h, i.e. equally for passenger and for goods trains. Further limits are to be stated on the following lines:

Dilijan - Ijevan with	30 - 40 km/h
Hrazdan - Sotk with	50 km/h and
Masis - Yeraskh as ever with	100 km/h for passenger trains and 80 km/h for goods trains

1.1.1.3 Track construction

1.1.1.3.1 Rails

As in Azerbaijan and Georgia also in Armenia all rail sections are of Russian origin and of the same steel quality. Owing to their chemical quality they belong to self-hardening steels and may be everywhere used with the permissible steel tensions being 840 - 900 N/mm^2. This refers to R65 as well as to R50 and to R43 which exists rarely. A chemical analysis was not available.

1.1.1.3.2 Sleepers

The density of sleepers is 1 840/km. Accordingly they are laid at a distance of 54 cm. In narrow curves up to 2000/km are laid which corresponds to a sleepers distance of 50 cm. Timber and concrete sleepers are used, namely at a 40 % : 60 % ratio (timber to concrete sleepers). Timber sleepers are predominantly laid in curves with small radiuses. The former Soviet Union was the supplier of both types of sleepers. Timber sleepers consisting of white deal were impregnated in Gori (Georgia) and thereupon supplied to ARM.

1.1.1.3.3 Rail fastening

The facilities to fasten rails on concrete sleepers consist of a ribbed bearing plate containing a rail clip. The ribbed plate is fixed to the sleeper by tie bolts which are anchored in a chamber by a quarter turn.
This type of fixing does no longer correspond to the European standard and results also in an early loss of the non-positive bracing by the wheel/rail contact the vibration of which destroys the anchor chamber of the bolt.
In the case of fixing rails on a timber sleeper the rail lies on a bearing plate which is fixed by rail spikes on the timber sleeper. The rail foot is also retained on the bearing plate by rail spikes. This type of fixing does not correspond to Western standard.

1.1.1.3.4 Points

In the railway network of ARM altogether 1575 points are installed, 468 thereof on the main line. They are to be assigned to the following types:

76 pieces	R65	1:11
392 pieces	R50	1:11 and 1:9,

The exact number distinguished by their inclination could not be given. 50 % of the points have to be replaced.

1.1.1.3.5 Level crossings

So far data have not been made available.

1.1.1.3.6 Ballast standard sections

The regulations contain drawings of standard sections for single track and double track lines. They have not been observed - whatever the reasons might have been. The impression during an inspection ride was accordingly. Thereby, the following defects could be stated:
The width of the embankment crown and cuts is insufficient, side paths and dewatering facilities are lacking. The inclinations of the slopes and cuts have rather formed accidentally than by construction. Especially on the mountain lines (70% of all lines) the sections are so narrow that the loading gauges may not be exceeded, even not insignificantly. Due to the required crown width and side paths lacking the sleeper fields are loosing their shape and the sleepers end lie bare and without being supported by ballast. Thus, the area for the distribution of compression is remarkably reduced causing an early destruction of the sleepers, an increased wear of rails and rail fixtures. Yet, an aerated ballast bed permeable to water of the prescribed width of 30 - 35 cm may be detected rather rarely than frequently. The rail heights differing up to 10 - 15 cm suggest that in the case of replacement of tracks the new track is laid on the smoothed, old ballast bed which is by 100 % polluted. That is why only 10- 15 cm of the ballast are replaced instead of the complete bed. The unequal track height may be seen especially in stations and on double track sections.

1.1.1.3.7 Ballast

ARM is the operator of a ballast factory in Ayrum. Laboratory investigations confirm that basaltes, diorite and porphyrite were used in conformity with the requirements of GOST 7392-55 and TU 159-53 MPSM for the production of track ballast. Also in the fractions 5-25 mm and 25-60 mm their use as track ballast according to GOST 7392-

78 is confirmed. Visual inspection, however, shows that gravel, stone chips and other rock material were used which are not suited for a ballast bed.

1.1.1.3.8 Subsoil conditions

By visual inspection sludge places were detected which, however, are due to waterproof old ballast layers. Information on the quality of soil has not been made available.

1.1.1.4 Technical state of tunnels and bridges

So far information is not available on the number of bridges and tunnels existing in the whole railway network. Only for the line Ayrum - Yerevan the following data were furnished:

There are 11 bridges of a varying span of 11-50 m, multispan bridges, predominantly steel constructions dating back to the 19th or early 20th centuries about the state of conservation of which further details cannot be given. Owing to their age of 80 - 100 years they have reached their service life limit and their restoration is probably required.
A bridge on the line Masis - Nurnus with a span of 56, 160, and 56 m, steel construction with the bridge floor below. According to the year of construction being indicated with 1979/1980 a good state of conservation is assumed.

1.1.1.5 Technical state of the railway premises

Information on intermediate stations, their number, significance to operation and special facilities see 1.1.4

1.1.1.6 Weak-point analysis and planning of reconstruction

A weak point of the railway network is the lack of a regular track maintenance and preservation and its regular, yearly renewal related to its service life and load alternation. The first utilizable data make suggest that approximately 40 % of the border point Ayrum - Gyumri -Masis - Yerevan and Masis - Yeraskh main line have to be replaced. Further investigations will have to be made.

1.1.1.7 Factory producing reinforced concrete sleepers

1.1.1.7.1 Preliminary remarks

The railways of the Caucasian countries suffer from the fact that all track materials, except ballast, have to be imported. Yet, frequently sufficient financial funds are lacking which - if they will once be available - will have to be spent on other imports having a higher priority. The track restoration work in the whole Caucasian region will cover approximately altogether 1000 km in the next few years and in the long term about 400 km/year. For this renewal the demand of sleepers will be 1000 km x 1840/km = 1 840 000 reinforced concrete sleepers in the short in the next four years which - when the starting shot will be fired in 1998 - will have to be supplied and installed before 2002. On the long term, in the years to follow, a yearly demand of 400 km x 1840/km = 736,000 sleepers will be required. These figures lead necessarily to the consideration to acquire the technology for the production of reinforced concrete sleepers and to cover this demand from own production. And this the more, as most of the raw materials for the production of concrete (gravel, sand, cement) are available in the region. The creation of jobs would, on the other hand, also improve the labour market situation. Investigations of the availability of special steels, fixing means and plastic elements are being made.

1.1.1.7.2 Selection of location

Considerations have led to the perception that it would be reasonable and absolutely economical to erect a sleeper factory for all Caucasian countries. This factory should produce with a joint participation and leadership, cover the demand of Armenian, Azerbaijan and Georgian Railways in conformity with the presented calculations of quantities and sale of sleepers. The following inspections were made to propose a location:

- Armenia: concrete factory in Yerevan city. All equipment for the production of reinforced concrete is available. The factory produces prestressed reinforced concrete slabs and has up-market plants for the production of prestressed main trusses. Aggregates are supplied to the factory from a distance of about 13 - 15 km by road transport. A track connection is available and may be used.

- Azerbaijan: near Kishli station. Factory producing tunnels, bridges and reinforced steel structures. Halls for the production are available, yet comprehensive construction and restoration work would be required.

- Azerbaijan: near Kishli station. Factory producing reinforced concrete products and structural members. Hall may be restored by limited funds. Boom system, storage area, water supply and transformer station are available. The factory

produces reinforced concrete slabs and foundation blocks.

- Azerbaijan: Dollyar station, with a direct connection to the concrete factory. A factory with modern equipment. Water, current supply points, hall are available and after effecting some constructional modifications usable. Technology for the production of concrete pipes moulded by centrifugal action of 80 - 120 cm diameter is known. For the time being, still 250 persons including staff working in the quarry are employed. The quarry is about 13 km away from the factory, quarry materials are transported to the crushing plant by means of trucks.

- Georgia: outskirts of Tbilisi. Track connection is available. Former steel works with various branches of production, among them also reinforced concrete industry, since 7 years no longer production. In the mean time the factory was not maintained, is in a desolate condition. Recommissioning of the production will be possible only at high expenses.

- Georgia: 50 km south of Tbilisi, Zshradsma station, Durnuki factory. a ballast factory in operation. Supply of water and current may be extended by a third connection (ring circuit), quarry 6 km away, connection by a track line already planned to avoid the expensive road transport susceptible to break down. The construction of a hall has been prepared, column row erected, trusses for roof construction are available, central position for Azerbaijan and Armenia.

- Georgia: Steel works in Rustavi. Possibilities of prestressing steel production have been discussed. The management of the works needs further specifications, first of all, a comparison of German/European standards and Russian standards for the required steel quality.

1.1.1.8 Prospects

In the next stage of work profound data relating to the main line Tbilisi - Georgian border/Armenia - Yerevan - Masis - Dshulfa, the technical state of the railway bridges, the technical state of the tunnels, the technical condition of the railway premises, a weak-point analysis and restoration planning and further data relating to the prestressed concrete sleeper factory and an analysis of the structure of technical organisation will have to be presented.

1.1.2 Conditions of signalling and telecommunication

An analysis of the deficit of signalling systems for the Azerbaijan and Georgian Railways was already carried out in the framework of the project „Pre-investment study and pilot train Baku - Tbilisi - Batumi/Poti". That is why these results are not again represented. Yet, the analysis of the state of the signalling and telecommunication systems of the Armenian Railway which was not involved in the above-mentioned project is comprehensively represented. However, the conditions existing in telecommunication of the Azerbaijan and Georgian Railways are represented in greater detail.

1.1.2.1 Armenian Railway

1.1.2.1.1 Signalling systems

1.1.2.1.1.1 Technical data

Panel operated signal boxes of Russian construction from the period between 1974 - 1979 are used for operation on the stations of the Yerevan - Ayrum line. The routes are set up by means of entrance and exit buttons. After the train ride is terminated the route is released automatically. In the event of an accident occurring auxiliary releases are possible. On open line sections an automatic section block is available. Light signals are used for signalling. The points are actuated electrically. The presence-of-trains indication for the automatic block is passed on through track circuits 220 V / 50 cps. The power supply of the signalling systems is effected through an overhead line which is fixed at railway poles.

The service life of the equipment used can be seen from Tab. 1.1-2

Tab. 1.1-2: Service life of signalling systems

equipment	period
cable systems	30 years
light signalling equipment	35 years
point mechanisms	16 years
presence-of-trains indicating equipment	20 years
panel operated signal boxes	25 years
relay systems of the automatic block	28 years

Condition of the existing plants

The technical state and the operatability of the systems of station and line equipment is not satisfactory to ensure a safe operation of trains. The required replacement of worn-out signalling systems was effected only to a small extent during the last few years. The systems were always only repaired using the available means. Yet, with the age structure of the equipment used rising we have to proceed from an aggravation of the state and increase in failing of the equipment. We could not include a survey of the faults of the signalling systems for the past years. An evaluation of faults due to equipment and copper components having been stolen was not made. After the transport volume declined the utilisation of the tracks and stations declined, too.

The relay systems of the stations are serviced and defective components are replaced if spare parts are available. By a fire in the interlocking cabin of Yerevan passenger station in 1995 the installation was nearly completely destroyed. Local experts restored the equipment using all available reserves to make it again operative.

Tab. 1.1-3: Plant unit of the Armenian Railway

Equipment	total of equipment
points	1250
light signal facilities	1702 thereof pole signal facilities 750 dwarf signal facilities 1040
track circuits	1601
interlocking cabins	33
level crossings	30

In the Gyumri - Ayrum section, and especially in the area near Spitak, the buildings of the signalling and telecommunication systems were completely destroyed by an earthquake in 1988.

As emergency variant goods wagons without bogies were used as relay containers for 6 stations. Yet, they were not heated and thus the relay equipment failed repeatedly in winter. The above-mentioned state has been preserved up to this day.

This concerns the following stations:

- Maisyan
- Dshadshur
- Kaltakhchi
- Nalband
- Spitak
- Archut

Signals

By the outer condition of the signalling and dwarf signalling equipment you can detect corrosion at the poles and signal screens caused by outer influences. The visibility of some signals is limited for the staff of the locomotive. Yet, this is also caused by the bad condition of the signal lenses predominantly used. Functioning of the equipment is affected by damages caused by third persons and theft of required elements, e. g. the relay systems of the block cupboards of the automatic block and the branch cables at the signal poles and the lines for the power supply of the equipment of the automatic section block.

Point mechanisms

Point mechanisms of the SP-6 type are used. The condition and the operatability of the existing electric point mechanisms are predominantly affected by the bad condition of the points. The required quite position of the point mechanisms is not given by the existing track system. The outside condition of the point mechanisms is only sufficient as a result of corrosion. Electric motors, point relay systems and internal wiring have reached the limit of service life of approx. 60 % of the point mechanisms.

Presence-of-trains indicating equipment

The presence-of-trains indicating equipment checks whether vehicles are on specific track sections or whether they are free.

The presence-of-trains indicating equipment works on the basis of 50 cps track circuits for the automatic vehicle-on point and track section indication. The Armenian Railway disposed of a throughout presence-of trains indicating system. The condition of the track system forms the basis for a trouble-free functioning of the track circuits. Owing to the bad resistance of insulation of the tracks and points the still existing track circuits break down again and again. The functioning of the equipment is also affected by their damaging by third persons and theft of the required components, e.g. chokes used, connectors and connection ropes. Additional expenditure, using

concrete rings to house the choke transformers which are buried up to the upper edge of the terrain, is to prevent the theft of track circuit equipment. The chokes used and the connection ropes and connectors required for connection to the track are in a bad condition. The operatability of the insulated rail joints is strongly restricted by their state.

Cable systems

All cables supplying electric power to outdoor installations are buried. The cable connecting stands installed in buildings are in a good state. Distribution boards are used for the connection of individual branch cables and the connection of the main cables among each other. The state of the track connecting boxes is not satisfactory. Failing of the outdoor installations is still favoured by this circumstance.

Level crossings

The installation contains the equipment required to ensure safety at the level crossings.

All level crossings are manned. In the case of an irregularity or total failure of an automatic gate installation occurring the plant is operated manually. Most frequently irregularities of the gate installations were stated due to external action, i.e. removal of signal bells and light signal lenses of road signals. A further priority of affecting the functioning is the electric motor required for actuation.

1.1.2.1.1.2 Measures required

To increase the present traffic volume the reliability and the operatability of the signalling equipment has to be improved. It will be necessary to replace the signalling plants in the short and medium term. Short-term measures relate to replacing of important components of existing plants to increase their reliability. After having inspected the existing signalling plants and studied the existing conditions it would seem to be more advantageous to apply the available Russian equipment also in future. It has proved its reliability and robustness in the last years. Thus, the demands made on the operating and service staff would not change.

Studies have confirmed that given the respective financial funds a supply of spare parts from other countries of the former Soviet Union will be possible.

To restore a full functioning of the equipment and to put up with the prognosticated traffic volume it will be necessary to implement the following measures in the periods mentioned.

Construction of new stations where provisional ones exist. It will be possible to use gradually European signalling equipment in these stations. The stations will be built in a few stages. The following survey shows the demands for equipment and the required expenditure.

1.1.2.1.1.3 Supply of spare parts

Before the political change has taken place in the former Soviet Union all signalling plants had been produced in other Soviet republics. Signalling equipment had also been supplied to Armenia and installed there. That is why so far it is only possible to get the required spare parts and complete plants of the equipment used in signalling systems from the republics of the former Soviet Union.
A production of spare parts for signalling systems does not exist in Armenia. Attempts have been made to establish contact to existing enterprises and to negotiate on the production of spare parts. Thus, the enterprises were handed over components as samples and it was checked whether they could be produced. Thus, e.g. copper windings were replaced by aluminium windings in the choke transformers and some choke transformers were built for test purposes. Yet, due to financial funds lacking starting of the production of choke transformers and other spare parts failed.
Owing to the financial squeeze spare parts have not been bought in the last few years. Elements required for repair and maintenance were not supplemented. Waste material was processed and used as the necessary spare parts.

1.1.2.1.2 Telecommunication systems

1.1.2.1.2.1 Technical data

The channel will be executed by cables and overhead lines. MKPAB-7*4*1,05+5*2 and MKPAB-4*4*1,05+5*2 will be used as cable types.

Transmission systems

Various systems are used for the transmission on the track.

- K-12-12 12 channel system
- K-24T 24 channel system
- B-3-3 3 channel system
- K-60 60 channel system
- B-12-3M 12 channel system

Telephone system

To make connections manual exchanges of the M60 type are applied. Exchanges of the ATC type, year of construction: 1949, KASS-8 and KASS-22-35 are used as automatic exchanges.

Telegraph system

The following equipment is available:

Tab. 1.1-4: Existing teleprinters of the Armenian Railway

exchange	teleprinter type	number
Yerevan	F-2000	2
Gyumri	F-2000	2
Vanadzor	F-2000	2
Sanain	CT-2M	8

Dispatcher system

The following dispatcher systems exist for the railway:

- train dispatcher
- car dispatcher
- dispatcher of the repair staff
- energy dispatcher.

Radio service on trains

Systems of the ZE RTS A2-4M and 71 RTM A2-4M types are used.

1.1.2.1.2.2 State of the existing equipment

A priority are the instable connections of the telegraph system. All channels are established by means of overhead lines and cables. The couplers required for the connection of the cables have become partly leaky. This condition affects the operatability of the channels.

Dispatcher system

All existing equipment has been installed in the period between 1970 and 1990. Owing to the financial squeezes the equipment was not regularly serviced and a necessary replacement of worn-out components was not made.

Telegraph system

The equipment used was installed between 1965 and 1990. The existing equipment of the ÑT-2M type is scarcely still operatable owing to its technical state. Equipment of the F-2000 type is strongly restricted in its functioning owing to spare parts lacking.

Radio service on trains

The radio service on trains allows to establish a connection between stations and traction vehicles. In addition, traction vehicles which are on open line may be contacted by the operating staff of the stations. Accordingly, the stations of the Yerevan - Ayrum route and the traction vehicles are equipped with radio service on trains. Furthermore, mobile radio sets are available for the staff of the formation area. The existing equipment is operative, yet has a lower quality of transmission.

1.1.2.1.2.3 Measures required

When envisaging the measures to be undertaken it has been always proceeded on the fact that the condition of the plants has to be improved in the short term. In addition, it is necessary to use modern equipment to master the increasing transport volume. An important fact in coping with the transport volume and providing safety in passenger and goods traffic is a stable communication connection between all participants of the transport process. The facilities required such as power supply, air conditioning, communication plants form part of the cost survey. The Power Supply Department supplies the voltage required for the equipment. Necessary measures such as e.g. the replacement of transformers form part of the power supply project. To meet the requirements relating to telephone exchange a gradual replacement of the existing manual exchanges and automatic exchanges with analog equipment by digital exchanges will have to be effected. An exchange can be extended gradually, starting with a few subscribers up to 100 000 subscribers. The following demand for subscribers connections has been stated for the individual exchanges:

- Yerevan 2000 subscribers
- Gyumri 1740 subscribers
- Sanain 400 subscribers
- Vanadzor 400 subscribers

- Ayrum 200 subscribers
- Hrazdan 200 subscribers
- Sevan 200 subscribers
- Charentsavan 200 subscribers

1.1.2.1.3 Maintenance

1.1.2.1.3.1 Organisation and equipment

Central repair shops specialised separately in signalling equipment and in telecommunication equipment do not exist, the existing central repair shops form a unity. The central repair shops in the individual sectors are responsible for the maintenance and repair of signalling and telecommunication equipment. The technical parameters of the elements and equipment used in signalling and telecommunication systems are checked and documented in the check and test station (KVP).

An intra-company telephone system exists for the communication between maintenance staff and dispatcher management.

There are the following central repair bases for the equipment of signalling and telecommunication systems:

- Yerevan
- Gyumri

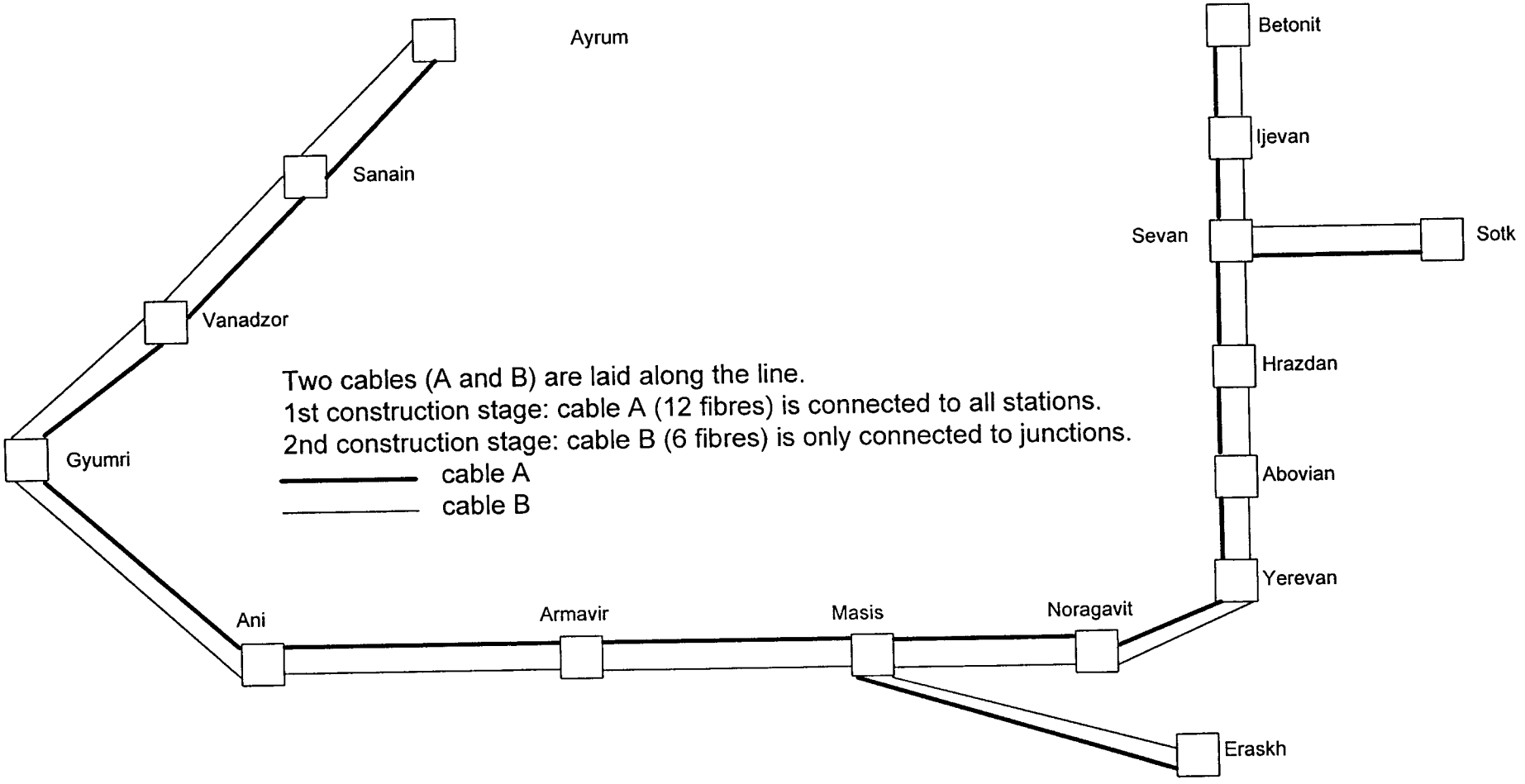
The locations of the repair bases are contained in Annex 1.1.-1.

The existing repair shops are equipped with the appliances required for repair, maintenance and checking whether the technical parameters are observed. Yet, it is necessary to gradually purchase modern measuring instruments and other tools. To carry through a fast and effective maintenance and screening it is imperative to replace the available rolling stock.

1.1.2.1.3.2 Staff

As of Jan. 1, 1996 319 persons have been employed in the Signalling and Telecommunication Equipment Department.

Fig. 1.1-1: Structure of the transmission system of ARM using optical fibre cables



1.1.2.2 Azerbaijan State Railway

1.1.2.2.1 Telecommunication system

In the present project the telecommunication systems used, i.e. their technical parameters, their present state and the measures required to improve the quality of message transmission, are registered. An important fact which was stated to be the priority of the investigations made was to make available stable channels in the short term. The use of new equipment as well as combining it with the existing plants which may be used still for some time is envisaged.

The following railway lines are investigated:

- Baku - Beyuk-Kyassik
- Baku - Yalama
- Alyat - Astara
- Alyat - Imishli (Nakhichevan)

The priority of the investigations refers to the section Baku - Beyuk-Kyassik.

1.1.2.2.1.1 Technical data of the plants

Overhead lines and cables are used as transmission medium. Steel and copper lines of various sizes (3, 4 and 5 mm ∅) are used for the overhead lines.
Cables of the MKPAB 7 x 4 x 1,05 + 5 x 2 x 0,7 + 1 x 0,7 type are used in the cable systems.

Transmission systems

Predominantly the following systems are used for transmission:

K-60	60 channels	12 - 252 kpcs
B-3-3	3 channels	4 - 32 kpcs
B-12	12 channels	6 - 143 kpcs

Telephone system

To make connections manual exchanges of the M-60, MPU-20-3 and MPU-80-7 types are used. The capacity of the potential subscribers and the years of construction of the exchanges are to be seen from Fig 1.1-2.

Telegraph system

The following equipment is available:

Tab. 1.1-5: Existing teleprinters of the Azerbaijan Railway

teleprinter type	number
T-63	75
STA-CTA-67	39
F-1100 and F-2000	45

Dispatcher system

Data not yet available.

Radio service on trains

For the communication between the stations and the locomotive crew radio service on trains is used. Systems of the 43 RTS-A2-4M type are predominantly used. The radio system is operated with a frequency of 150 - 154 mcps in Simplex operation.

The effective radius of the stations is:

- between station and locomotive 8 - 12 km
- among locomotives 2 - 3 km.

1.1.2.2.1.2 State of the existing equipment

The structure of the channels for the AGZD can be seen from figure 1.1-2. On the Baku - Alyat section through Baladshary junction two cables of the MKPAB 7 x 4 x 1,05 + 5 x 2 x 0,7 + 1 x 0,7 types are laid, 2 systems of the K-60 type (120 channels) are used. The 5 x 2 x 0.7 pairs of wires (signal wires) contained in the cable are used exclusively for signal transmissions. The signal wires of a cable laid are laid through branch sleeves on each location of a relay box along the line.

In the Alyat - Beyuk-Kyassik section exclusively an overhead line is used as transmission line. The technical state of the overhead lines is not satisfactory. Problems are brought about by defective or lacking insulators, by the corrosion of damaged stretchers and by worn-out conductor material. The complete line poles are worn out by 90 %.

The following number of channels is used in the individual sections:

- Alyat - Gyandsha 15 channels
- Gyandsha - Akstafa 12 channels
- Akstafa - Beyuk-Kyassik 3 channels

At the Baku - Yalama section two cables of the MKPAB 7 x 4 x 1,05 + 5 x 2 x 0,7 + 1 x 0,7 type have been laid between the stations Baku - Shirvan and Divichi - Yalama. An overhead line involving 12 channels exists between the stations Shirvan - Divichi.

Transmission systems

Data are not yet available.

Telephone system

The stations are equipped with automatic and manual exchanges.

The plants were erected between 1967 and 1996. The manual exchanges of the following stations have to be replaced by automatic exchanges:

- Baku MRU-80
- Baladshary MRU-20
- Nakhichevan MRU-20

In the region covered only the exchanges were registered, a statement on their condition could not be made.

Telegraph system

The equipment used was installed between 1965 and 1990.
Owing to their technical state the existing teleprinters of the T-63 and STA-CTA-67 type were no longer used. The functioning of the F-1100 and F-2000 types is strongly restricted due to spare parts lacking. A priority is the supply with paper and ink ribbon.

Dispatcher system

Various dispatcher circuits exist for the Railway:

- train dispatcher
- car dispatcher
- dispatcher for the repair staff
- energy dispatcher

Radio service on trains

All radio systems used at stations and in locomotives work reliably. The radio sets for the shunting staff are operative. Bigger problems do not arise with the radio systems used.

1.1.2.2.1.3 Measures required

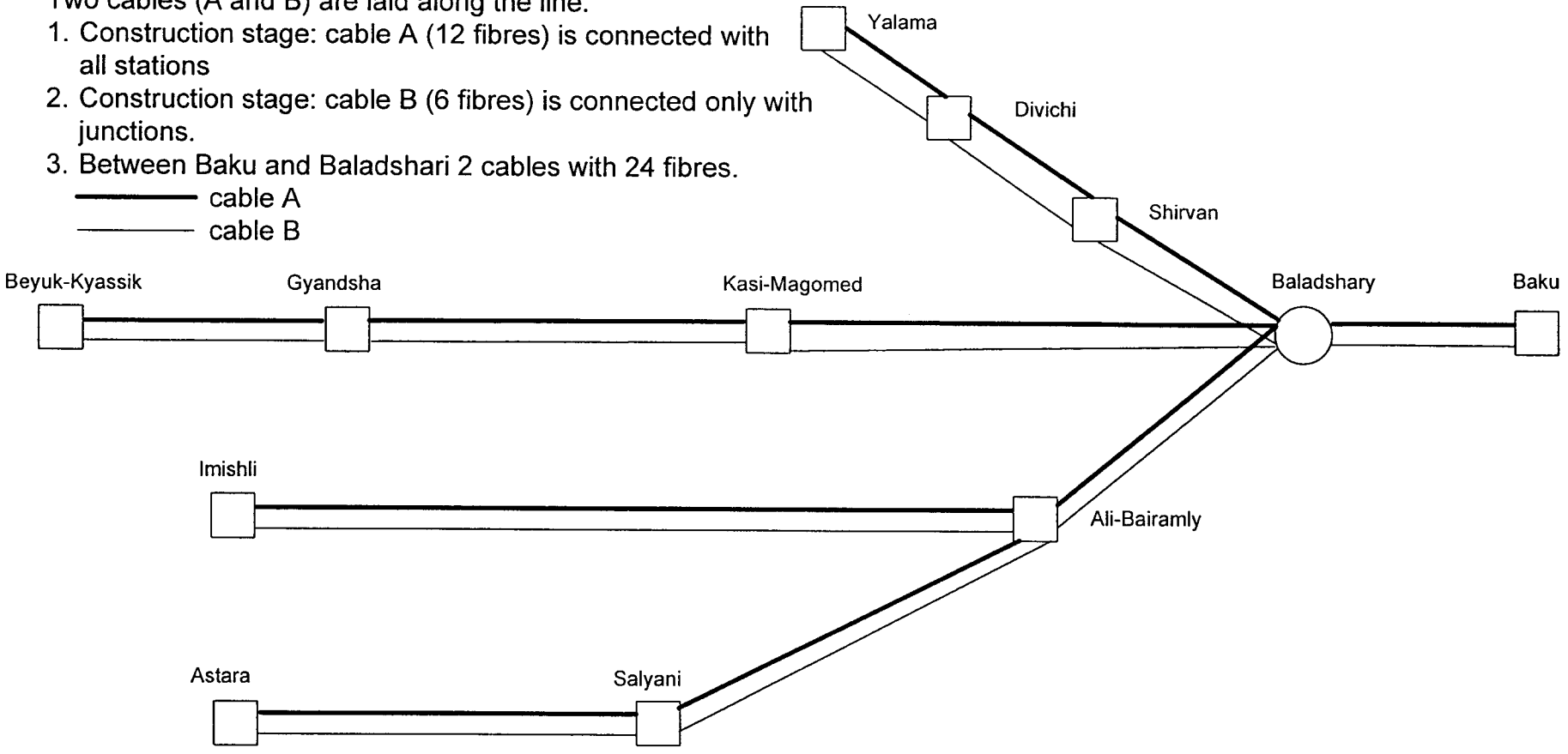
When envisaging measures to be undertaken it has been always proceeded on the fact that the condition of the plants has to be improved in the short term. In addition, it is necessary to use modern equipment to satisfy the requirements connected with the increased transport volume. An important fact in coping with the transport volume and providing safety in passenger and goods traffic is a stable communication connection between all participants of the transport process.

Fig. 1.1-2: Structure of the transmission system of AGZD using optical cable

Two cables (A and B) are laid along the line.

1. Construction stage: cable A (12 fibres) is connected with all stations
2. Construction stage: cable B (6 fibres) is connected only with junctions.
3. Between Baku and Baladshari 2 cables with 24 fibres.

cable A
cable B



1.1.2.3 Georgian Railway

1.1.2.3.1 Telecommunication systems

1.1.2.3.1.1 Technical data of the systems

On the Tbilisi - Batumi / Poti section a system including 60 channels of the „K-60" type and a system including 30 channels is used for telecommunication. Between Gardabani and Tbilisi a system including 12 channels exists. The channels are executed on cables. Predominantly cables of the MKPAB-7*4*1,2+5*0,9+1*0,7 type are used. On the sections Batumi -Lantshkhuti - Samtredia cables of the MAVM-K-7*4*1,2+5*0,9+1*0,7 type were used. The connections are made by automatic and manual exchanges.

Condition of the existing equipment

Cable systems

A priority are the instable connections of the telegraph system. This fact has also remarkable effects on the train traffic.
The whole telecommunication line of the Tbilisi - Batumi / Poti line consisted of cables. The installations were built in 1984 between Tbilisi - Gardabani, in 1982 between Tbilisi - Khashuri, in 1979 between Khashuri- Sestafoni and in 1980 between Sestafoni - Samtredia. The cables required for establishing the connection have been destroyed by vandalism on the various sections. The state has remarkable effects on the operatability of the telecommunication system.

Cables are lacking on the following sections:

Tab. 1.1-6: Cable deficit

from	to	km	type
Senaki	Abasha	13,4	MKPAB-7*4*1,2+5*0,9+1*0,7
Gardabani	border	9,1	MKPAB-7*4*1,2+5*0,9+1*0,7
Marneuli	Sadakhlo	29,2	MKPAB-7*4*1,2+5*0,9+1*0,7
Batumi	Lantshkhuti	73,5	Typ MAVM-K-7*4*1,2+5*0,9+1*0,7 1)
Lantshkhuti	Samtredia	30,5	Typ MAVM-K-7*4*1,2+5*0,9+1*0,7 1)
Senaki	Poti	38,3	Typ MAVM-K-7*4*1,2+5*0,9+1*0,7 1)

1) The Railway laid in these sections already optical fibre cables including 4 fibres.

Radio service on trains

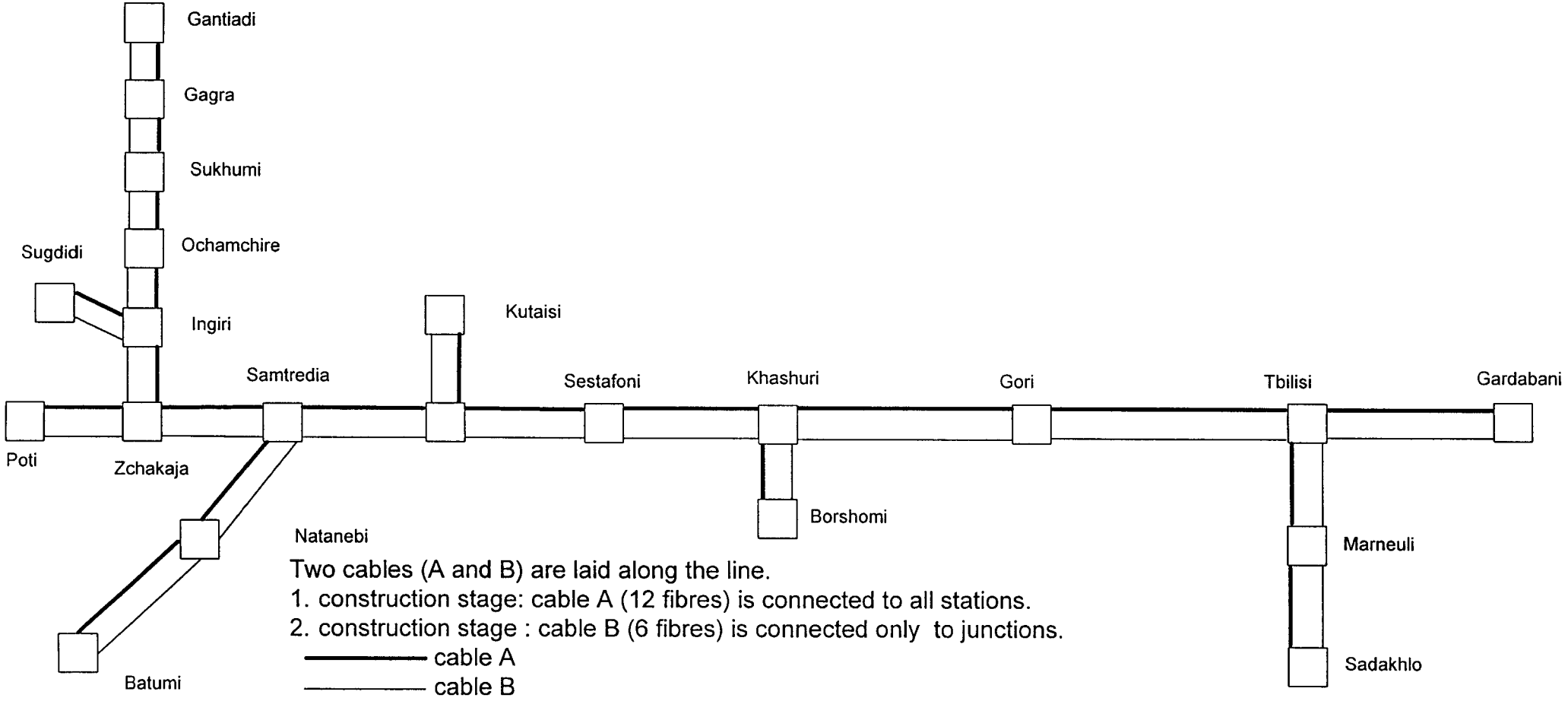
The radio service on trains allows to make connections between stations and traction vehicles. In addition, traction vehicles which are on open line may be contacted by the operating staff of the stations. Accordingly, the stations of the Tbilisi - Batumi/Poti line and the traction vehicles are equipped with radio service on trains. Furthermore, mobile radio sets provided by the EU are available.

1.1.2.3.1.2 Measures required

To comply with the increased demands of telephone exchange the existing manual exchanges and automatic exchanges with analog equipment have to be replaced by digital exchanges. An exchange may be extended in a few stages, starting with a few subscribers up to 10 000 subscribers and more. The following demand for subscriber connections was determined for the individual exchanges:

- Batumi 1000 subscribers
- Poti 1000 subscribers
- Senaki 400 subscribers
- Samtredia 3000 subscribers
- Kutaisi 1000 subscribers
- Sestafoni 500 subscribers
- Khashuri 3000 subscribers
- Gori 500 subscribers
- Tbilisi 7000 subscribers
- Rustavi 200 subscribers
- Gurdshaani 500 subscribers
- Marneuli 200 subscribers
- Borshomi 200 subscribers

Fig. 1.1-3: Structure of the transmission system of GRZD using optical fibre cables



List of the abbreviations used

STM-1	synchronous transfer mode with a transmission speed of 155 Mbit/s
SDH	synchronous digital hierarchy
PCM	pulse code modulation
ADM	Add/Drop-multiplexer
CCM	cross connect multiplexer
FESA	fixed radio system of the railway track
FADA	station master system
MESA	mobile radio system of the railway track
KVP	check and test station
LWL	optical fibre cable
V	Volt
cps	cycles per second

1.1.3 Conditions of power supply

1.1.3.1 First information about the Caucasian railways

1.1.3.1.1 Introduction

The power supply networks of the three Caucasian railways are nearly similar. Differences were only found in the installed equipment, which results from different operational requirements. Each railway is using a DC power supply for the catenary system. The electrified network of the Caucasian railways (ARM, AGZD, GRZD) is supplied by a 3,000 V DC system. The nominal substation output voltage level is 3,300 V DC. The voltages on the overhead line contact system shall be limited:

- minimal 2,700 V
- nominal 3,000 V
- maximal 4,000 V

The main high voltage (HV) power supply of the Railways is provided by the local energy supplier companies, organised in Arm-Energo (Armenia), Az- Energo (Azerbaijan) and Grus- Energo (Georgia).
Feeding voltages are normally AC 110 kV, 35 kV and 6 kV, 50 Hz. On each line are power supply substations supplies in a distance of approximately 10 to 20 km the line. They are normally technically equipped with 2 transformer sets for the traction power supply, including the rectifier units, and transformers for additional power supply (auxiliary railway supply, signalling supply and some times non- railway supply).

1.1.3.1.2 List of main equipment for power supply substations

The substations are equipped with:

- 110 kV (or 35 kV, 6 kV) switchgear
  - circuit breakers
  - isolator switches
  - earthing switches
  - current transformer
  - voltage transformer
  - cable termination's
  - surge arrestors
  - control cubicles

- Main transformer
  - with protection and monitoring equipment

- 10 kV switchgear
  - circuit breaker
  - current transformer
  - potential transformer
  - earthing switches
  - switch disconnectors

- Rectifier transformer

- Rectifier units
  - for 6 and 12 pulse requirements

- DC switchgear
  - high-speed circuit breakers
  - negative return cubicle

- Battery/ charger unit

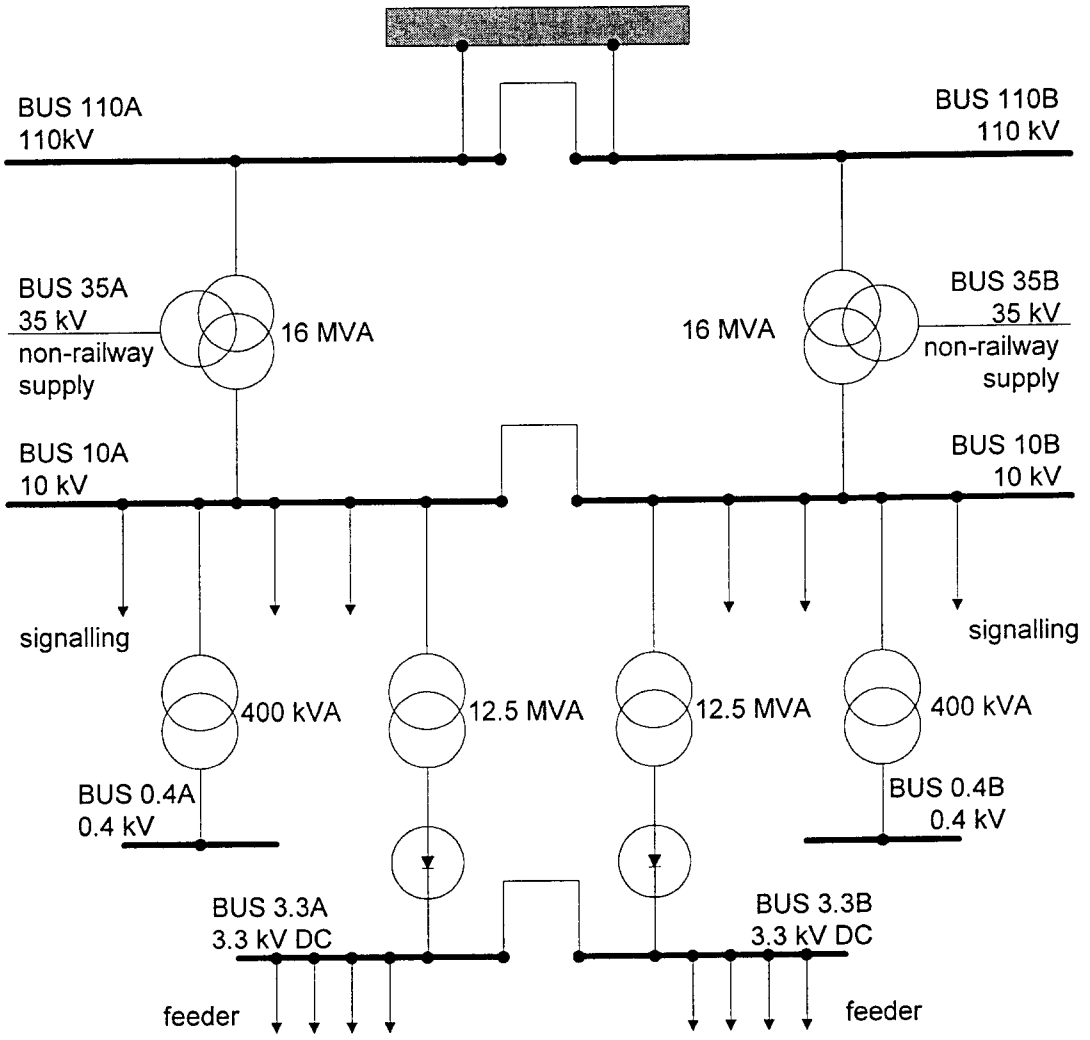
- Auxiliary switchgear
  - LV distribution panel 220/380 V
  - circuit breaker
  - measurement equipment

- AC cables
- DC cables

1.1.3.1.3 Single line diagram of power supply substations

The following figure shows a single line diagram of 110 kV power supply substations.

Fig. 1.1-4: Single line diagram of power supply substations



1.1.3.2 Draft information about the power supply of the Armenian Railways

1.1.3.2.1 Introduction

The power supply network of the Armenian Railways was analysed. After having studied the existing power supply system it can be mentioned that the whole system is still working, but under real poor conditions. On average the age of the power supply system is mostly older than 20- 35 years. In the last few years (since 1988) no additional rehabilitation/ modernisation works, except light maintenance, servicing and repair works, have been realised. Often maintenance work could only be done using parts from other stations or buying them at the „black market".

A planned and organised spare part supply is not more available any more. It is easy to understand, that in the result of such a „maintenance", during many years, a lack of additional restoration work was found. Modernisation of the power supply system cannot be recommended, first of all it is necessary to put the system back into a safe working position.

The substations often were operated only with one working transformer set. At present, taking into consideration the relatively small working operation programme, it seems to be sufficient. But on the other hand, with such an operating profile the substations are not really able to react in hazard or future situations.
Under normal conditions the neighbouring substation will take over the supply, but without any communication (SCADA, dispatcher line) with the dispatcher this cannot be realised.
Installed auto-reclosing systems are not working, as many other installed equipment do not, either.
There are rules and regulations for maintenance works (from the former Soviet Railways), but other reasons are responsible for a relatively poor level of in-time maintenance and repair.

After the disintegration of the former Soviet Union many electrical factories and suppliers are located outside Armenia now. This, and the financial situation of the railways, did not allow to maintain the system in time.

It can be mentioned that one reason for working with only one transformer set is the deficiency in transformer oil. Another cause of non-continuous work was found in the protection equipment of substations. Taking into consideration that the substations were built many years ago, when the traffic volume was higher than the present one is, the protection equipment was selected according to former (higher) requirements (VAB 43/ 6300A). Now, with smaller traffic and in this case with smaller traction currents on lines, the in-build protection high speed circuit breaker are not able to

handle smaller working currents because of its construction limits. *They must be changed without any delay to make the railways work safer!* These short-circuit protection units check for the occurrence of any fault currents (I protection) and dangerous touch voltages (U protection) in DC substations. But if the fault current or touch voltage exceeds the set overpowered limits, the frame short-circuit protection trips with time delay and with the result that the high-speed breaker burn down.

Another maintenance lack was found in the overages of the rectifier/ resistor units and battery sets, witch can not be maintained, repaired or changed in time.
Additional spare parts, like cables (4 to 185 mm^2), switches, lamps, signalling lamps, protection relay, current or voltage transformer, measurement equipment and many other electrical parts, tools and equipment are not available because of the mentioned problems.
The catenary system is also in a poor condition. The average wear of the contact wires is about 20% to 40%. The catenary system requires not only changing of the contact wire, but also poles, insulators, carrying cable, hangers, feeding cables, breakers and others.

It must be mentioned, that such a power supply system, as found, only for restoration requires a lot of additional work to bring back the system into a good working position (modernisation measures expected at the moment).

1.1.3.2.2 Finding of main weak points

Following please find a draft summary of found weak points:

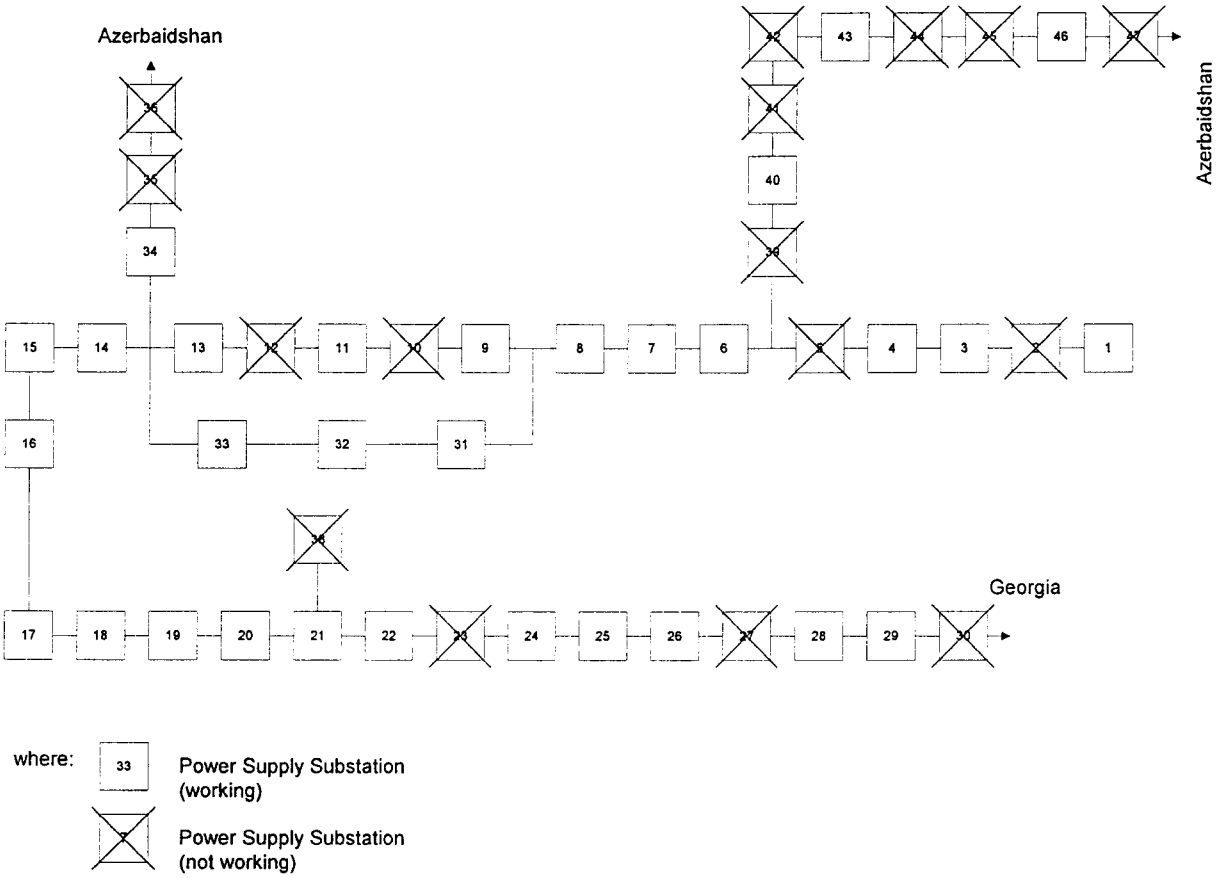
1. Transformer oil
2. High speed circuit breaker
3. Battery sets
4. High and low voltage cables
5. Communication between substations and the dispatchers, SCADA
6. Transformers (for each voltage level)
7. Diodes/ rectifier units
8. Protection equipment
9. Catenary wires
10. Insulators (mostly for 10 kV)
11. Current and voltage transformer sets (mostly for 35, 10, 6 kV)
12. Measurement equipment, tools and equipment
13. Spare parts

This list is only a short one and cannot reflect the existing situation.

1.1.3.2.3 Location of power supply substations

The following figure (Fig. 1.1.-5) describes the location and working situation of the Armenian Railway power supply network. A more detailed inventory will be prepared for the following reports.

Fig. 1.1-5: Single line diagram of the ARM power supply network



where are:

No.	Location	No.	Location	No.	Location	No.	Location
1	Vardenis	14	Masis	27	Tumanian	41	Fioletovo
2	Arek	15	Sovetakan	28	Sanain	42	Frolovo
3	Shorsha	16	Araks	29	Akhtala	43	Dilijan
4	Zovagiukh	17	Karakert	30	Ayrum	44	Kuibishev
5	Sevan	18	Aragatz	31	Abovian	45	Goshavank
6	Hrazdan	19	Ani	32	Kirza	46	Lusabaz
7	Charentsavan	20	Agin	33	Yerevan	47	Ijevan
8	Nurnus	21	Gyumri	34	Artashat		
9	Nor- Hadshyn	22	Dshadshur	35	Ararat		
10	Jegvard	23	Kaltakhtshi	36	Yeraskh		
11	Proshjan	24	Spitak	38	Artik		
12	Spandarian	25	Vanadzor	39	Megrazor		
13	9th km	26	Chagali	40	Arkhashen		

1.1.4 Conditions of stations

1.1.4.1 Present status

In line with the objective of the project, the analysis has been concentrated on the facts and figures required for the preparation of the Joint Ventures identified during the inception phase and for the implementation of the composite train between Tbilisi and Yerevan in addition to the Trans-Caucasian-Logistic-Express between Baku and Poti/Batumi inaugurated on 11th November, 1996.

The existing reports dealing with the status and the development of the railways of Armenia, Azerbaijan and Georgia which were made available (see Inception Report) were carefully examined. Existing data, statements and other relevant information provided by these reports have been taken into account in order to avoid a duplication of effort.

In addition, a questionnaire for the determination of the technical condition of the

- freight stations
- passenger stations
- marshalling yards
- border stations
- intermodal stations

was prepared, handed over to the headquarters of the Railways of Armenia (ARM), the Azerbaijan State Railways (AGZD) and the Georgian Railways (GRZD) and explained in detail. Due to the different quality of the data provided, some explanations and supplementary information were requested. In addition, field surveys were undertaken in container terminals and the railway stations of the capitals.

Taking into consideration the Joint Ventures identified, the analysis is concentrated on the main stations classified in the categories "Extra, 1 and 2". The selection of the stations was made in co-operation with railway representatives concerned.

In accordance with the supplement added to Work Package 1150, as described in the Inception Report, the terminals for combined or multi-modal transport of the Railway of Armenia (ARM), the Azerbaijan State Railways (AGZD) and the Georgian Railways (GRZD) have been analysed in more detail (see Chapter 1.1.4.3).

1.1.4.2 Passenger and freight stations

1.1.4.2.1 Armenian Railway

According to the analysis provided by ARM, there are 69 stations on the railway's 845 km network. Three of them are presently out of operation (Akhurian, Goyavan and Ijevan). Due to land slippage and rock slides, the section from Dilijan to Ijevan with the intermediate station Goyavan has been closed for some years. The border to Turkey with the border station Akhurian is also closed for the time being. The only working border crossing is with Georgia (Ayrum). The section between Arabkir and Yerevan cannot be used for scheduled trains due to the limited loading gauge.

Some stations are called in Russian "Razjezd"; only passenger boarding and alighting take place there; no overtaking, crossing or loading and unloading of freight wagons.

The line southwards to Iran (via Nakhichevan), a country with which most of trade of commercial goods is currently made, has been closed since years.

Twenty stations have been analysed in more detail including the border stations Ayrum (border station to Georgia) and Akhurian (border station to Turkey) and the marshalling yard at Masis near Yerevan. The detailed analysis including tracks, facilities for freight loading and unloading, condition of tracks and structures, volume of passenger and freight traffic as well as "repair work to tracks and structures required or planned to be carried out / cost estimations made by the Railways" is presented in Annex 1.1-2

Taking into account the current passenger and freight traffic as well as the projected traffic levels, all stations are generally characterised by overdesign and inefficiency.

The condition of most stations is poor due to age and maintenance backlog attributed to the very low level of the Armenian economy. The operation of trains is not hindered by the extent of facilities, but rather by their condition.

The number and length of the tracks more than satisfy present and future requirements. The condition of the permanent way can be assessed as poor to satisfactory. As already mentioned, the repair work required or planned to tracks, facilities for freight loading and unloading, station buildings, platforms and other facilities for passenger traffic are listed in Annex 1.1-2.

Due to the fact that, for some years, only a small number of freight trains has been running and some trains are formed at the loading yards, for instance Ararat, Karmir Blur, Yerevan, Charentsavan, Hrazdan and Sotk (gold mine; currently no mining), the capacity of Masis marshalling yard has only been used to a very limited extent.

Therefore, not all of the existing 20 operational tracks are needed. Although most the sorting lines are in poor condition and allow only low speed, the present requirements can be met. A decision on the number of sorting lines and secondary tracks to be renewed or repaired needs to be made depending on the future requirements.

The number of the existing loading and unloading facilities and their distribution within the network is satisfactory. In addition, there are several branch lines or private sidings connecting major factories to the railway. However, the present condition of the facilities at the main freight stations (Vanadzor, Gyumri, Masis, Ararat, Karmir Blur, Yerevan, Charentsavan and Hrazdan) must be considered as ranging from poor to satisfactory.

The main passenger stations Yerevan, Vanadzor and Gyumri are in satisfactory condition. The existing passenger facilities are adequate for the smooth operation of the train service. There are sufficient ticket offices and platforms. The number and length of the platforms more than satisfy the requirements. Due to the lack of demand, ticket reservation offices are not open at the present time. However, it will be necessary to perform maintenance on all passenger stations (station buildings, platforms, ticket offices). For instance, the station building at Yerevan is in urgent need of repairs to the roof. The station buildings at Sanain, Artik, Dalarik, Armavir, Echmiadzin, Masis, Ararat, Karmir Blur, Abovian, Charentsavan and Hrazdan are in need of general repairs. The station buildings at Archut, Spitak, Nalband, Kaltakhtshi, Dzadzhur and Maisyan were destroyed by the latest earthquake.

1.1.4.2.2 Azerbaijan State Railway

There are approximately 175 stations including the so-called "Razjezd" (see Chapter 1.1.4.2.1) on the 2,125 km network. The analysis has been concentrated on the main line Baku - Beyuk-Kyassik and the line (Russia) - Yalama - Baku - Goradiz - (Dshulfa). The section from Goradiz to Dshulfa has been closed for some years; entire portions are destroyed . Due to the situation in Chechnya, there are only a very small number of trains to Russia. Furthermore, the stations Salyany and Astara situated on the line Ali-Bairamly - Astara have been included in this analysis.

In agreement with the Project Co-ordinator of AGZD, 18 stations have been analysed in more detail including the border stations Beyuk-Kyassik (border station to Georgia) and Yalama (border station to Russia) and the marshalling yards at Shirvan, formerly the most important marshalling yard in the Caucasian region, and Baladshary.

The detailed analysis including tracks, facilities for freight loading and unloading, condition of tracks and structures, volume of passenger[1] and freight traffic as well as "repair work to tracks and structures required or planned to be carried out / cost estimations made by the Railways" is presented in Annex 1.1-3.

The condition of many stations is poor due to age and maintenance backlog. Since 1990, maintenance expenditures have been drastically reduced due to the lack of funds. The operation of trains is not hindered by the extent of facilities, but rather by their poor condition. Taking into account the current passenger and freight traffic as well as the projected traffic levels, all stations of AGZD are also generally characterised by overdesign and lack of efficiency.

The permanent way is generally in poor condition, and average commercial speeds on the main lines is down to 36 km/h. The track condition of some important stations, for instance Kishli-Baku, Baladshary, Baku Pass., Kasi-Magomed, Yevlakh, Beyuk-Kyassik, Ali-Bairamly, Imishli and Astara, is also poor and hampers train operations and operating safety. The number and length of the tracks more than satisfy present and future requirements. As mentioned, the repair work required or planned to tracks, facilities for freight loading and unloading, station buildings, platforms and other facilities for passenger traffic are listed in Annex 1.1-3.

It can be assumed that Azerbaijan will probably never recover transport volumes as high as those during the Soviet era. Therefore, the number of tracks for operational purposes can be reduced especially at the marshalling yards. Depending on future requirements, a decision needs to be made on the number of sorting lines and secondary tracks to be renewed or repaired.

The number of the existing loading and unloading facilities and their distribution within the network can be assessed as satisfactory. In addition, there are several branch lines or private sidings connecting the major factories to the railways. According to the number of forwarded wagons in 1995 (the latest figure available in January 1995), the main freight stations are Baku Tov., Karadag, Kyurdamir, Mingetchaur Main Station, Gyandsha, Shamkor, Dollyar, Kilyazi, Sumgait, Gyuzdek and Vatagi. Apart from Baku and Gyandsha, these stations are not included in the detailed analysis. However, taking into account the high level of traffic up to the beginning of the 1990's, it can be assumed that the number of facilities for freight loading and unloading meets the requirements. The present condition can be considered as being poor to satisfactory.

Most of the passenger stations, including Baku, Gyandsha, Yalama require repairs to the roofs and platforms. At the other stations the existing facilities for passenger traffic do not hinder train operations and passenger service.

[1] *The number of passengers arriving and/or departing at the stations could not be provided by AGZD; only figures for the whole railway could be made available.*

1.1.4.2.3 Georgian Railway

Georgia's entirely electrified comparatively small network (1,531 km broad gauge and 38 km narrow gauge) is characterised by a rapidly eroding asset base. Because of the isolation of the Georgian network resulting from the problems following the break-down of the Soviet Union, the Black Sea ports at Batumi and Poti as well as their rail connections have gained considerable importance. For political reasons, railway traffic is disrupted on the Transcaucasian line (starting from Moscow via the Russian border station Veseloe and Tbilisi to Yerevan) between Veseloe and Ingiri (Abkhasia) and the Ossetia branch between Shindidi and Zkhinvali. More than 90% of the present traffic is routed on the Transcaucasian route in direction to Yerevan and Baku respectively (core network, 764 km).
13 stations were selected by the Consultant and the railway representatives concerned for detailed analysis including the two large marshalling yards (Samtredia and Tbilisi Sort) and the border stations at Gardabani (border to Azerbaijan) and Sadakhlo (border to Armenia). The average distance between operational points is 9.8 km. The detailed analysis including tracks, facilities for freight loading and unloading, condition of tracks and structures, volume of passenger and freight traffic as well as "repair work to tracks and structures required or planned to be carried out / cost estimations made by the Railways" is presented in Annex 1.1-4.

Rail infrastructure is generally characterised by overdesign and lack of efficiency. The condition is in most cases poor due to the age, maintenance backlog, obsolete technology and damage through civil strife. Station lay-outs are characterised by a large number of parallel lines which can, however, only be passed at low speeds.

In view of the overall condition of infrastructure, GRZD has decided to restrict overall speed to 40 km/h. In many sections there are temporary speed restrictions down to 5 km/h.

Taking into account the current passenger and freight traffic as well as the projected traffic levels, operations are not hindered by the extent of facilities, but rather by their condition.

The number and length of the tracks more than satisfy the requirements. The condition of the permanent way of most stations analysed can be assessed as poor to satisfactory. According to the information provided by GRZD, the tracks of the port stations Poti and Batumi are very poor to poor. The tracks at Khashuri, Tbilisi Usl. and Gardabani are in satisfactory to good condition. As stated, the repair work required or planned to tracks, facilities for freight loading and unloading, station buildings, platforms and other facilities for passenger traffic are listed in Annex 1.1-4.

Most of the freight trains are presently formed at the loading yards (mainly at Poti and Batumi), the two marshalling yards being presently only partially used. Therefore, not all of the existing tracks for operational purposes (16 at Samtredia, 23 at Tbilisi Sort) are needed. Although most of the sorting lines are in poor condition

and allow only low speed, the present requirements can be met. Depending on the future requirements, a decision needs to be taken on the number of sorting lines and secondary tracks to be renewed or repaired.

At present, significant amounts of cargo are loaded only at the ports of Poti and Batumi. There are no capacity constraints at the loading yards. On the contrary, the load capacity cannot be fully used because the railway is neither in a position to supply a sufficient number of wagons in good time nor to form the outgoing trains accordingly. The present condition of the facilities for freight loading and unloading must be considered as poor to satisfactory.

The main passenger stations Samtredia, Sestafoni, Khashuri, Gori and Tbilisi are in good to satisfactory condition; the existing facilities for passenger traffic do not hamper passenger service. There are sufficient ticket offices and platforms. The number and length of the platforms more than satisfy the requirements. Due to the lack of demand, ticket reservation offices are not open at the present time. However, it will be necessary to perform maintenance on all passenger stations. The rehabilitation of the Tbilisi Pass passenger station building and the platforms started in 1987, but has not yet been finished. At Batumi, new buildings and facilities have been under construction since 1996.

1.1.4.3 Container terminals

Based on existing reports, together with additional facts and figures provided by the railways or obtained in field surveys, the following analysis and the overall assessment have been prepared. Apart from Gyandsha, all the container terminals mentioned below were visited.

1.1.4.3.1 Analysis

The Railways of the Former Soviet Union operated approximately 240 container terminals. However, only ten of them are located in the Caucasian Region (Armenia, Azerbaijan and Georgia):

Armenia
- Abovian (near Yerevan)
- Gyumri
- Karmir Blur (near Yerevan)
- Vanadzor

Azerbaijan
- Kishli-Baku
- Gyandsha
- Khirdalan (near Baku)

Georgia

- Gori
- Samtredia
- Tbilisi Tov. (Freight Station)

Taking into account the existing size of the railway system, the network of container terminals in these countries is sufficient to meet the demand. There is an adequate number of container terminals within the countries and the catchment area of each terminal is sufficiently widespread as to ensure complete coverage of the territory by the multi-modal system. Existing terminals are located adjacent to each of the capitals of the countries concerned, which themselves represent the most heavily industrialised regions.

On the other hand, the physical condition of the container terminals and the poor equipment are weak points which must be mentioned in connection with the multi-modal transport system in these countries:

The terminals at

- Abovian, Gyumri and Vanadzor (Armenia)
- Khirdalan (Azerbaijan)
- Gori and Samtredia (Georgia)

have not been in use for many years. (At Gyumri and Vanadzor a very small number of containers were handled by truck crane in 1996.) The terminal at Khirdalan has been out of operation since August 1995.

Only four container terminals are really in working order

- Karmir Blur (Armenia)
- Kishli-Baku and Gyandsha (Azerbaijan)
- Tbilisi Freight Station (Georgia).

The small terminals at Gyandsha and Gori are poorly equipped with cranes of 10 to 12 tonnes lifting capacity only. Two cranes have to work synchronously to lift together one 20' container.

Taking into account the limitation mentioned, there are only three container terminals that are able to handle 20' containers; one in each country. At Kishli-Baku, there is only one 20 t Valmet mobile container crane and in addition various other cranes with a lifting capacity up to 5 tonnes.

40' containers can only be handled at the sea ports (Baku, Poti and Batumi). At Karmir Blur 40' containers are lifted by railway revolving crane. 40' containers are

handled at Baku sea port based on an agreement concluded between AGZD and the Port Authority.

At present, about two third of the 20 tonnes gantry cranes are not in working order (seven out of ten). The main reason is a lack of spare parts; a lot of them were cannibalised. On the other hand there has not been a necessity because of considerably decreased volume of traffic.

The maximal possible train length under the crane is 20 container carrying wagons; on most terminals only 10 to 12 wagons. Therefore, the trains must be split up and shunting movements are necessary.

The present condition of the tracks is mostly very poor; some tracks should be renewed.

Most of the storage areas and the connecting roads to the terminals are in a very poor condition (not paved or damaged with large potholes). Damaged pavements (concrete, asphalt, concrete panels or simply compressed earth with gravel) obstruct the use of reach stackers. Although the possibilities for future development are restricted at some terminals, e. g. Tbilisi Freight Station, it can be assumed that the storage areas meet the future demand.

There are only one or two tracks under the crane and normally only one loading lane for the container trucks beside the storage area/craneway.

In most cases, the location in the railway network is acceptable. Except for Khirdalan; the distance to trunk roads and the main destinations is short.

Communication and data processing technology is not available; there is only a telephone connection at some terminals.

Some terminals are not fenced. The fences of the other terminals are in need of repair to prevent the entrance of non-authorised persons and larceny of goods. The illumination of most of the terminals is not possible due to missing or damaged light installations.

The main figures are compiled in Annexes 1.1-5 to 1.1-14 (Analysis of Existing Terminals for Combined Traffic). Furthermore, the main deficiencies are described and an overall assessment is made.

1.1.4.3.2 Conclusions and recommendations

In summary, it must be stated that only the terminals at Karmir Blur, Kishli-Baku and Tbilisi meet the present demand to some extent. These terminals are able to handle 20' containers without any investment. Necessary investment measures for these terminals will be determined during the next field mission.
Therefore, the container terminal at Karmir Blur is no hindrance for the implementation of the proposed feeder train (composite train) between Tbilisi and Yerevan to the Caucasian-Logistic-Express between Baku and Poti/Batumi that was inaugurated on 11th November, 1996. Another fast and cheap transport link between Western Europe and Asia as well as to Turkey and Iran via Armenia can be provided by these trains.

The proposal included in the TRACECA Port Project to establish a new container terminal at Baku Sea Port where also 40' containers can be handled is approved by the Consultants.

The envisaged inclusion of the terminal at Samtredia in the Trans-Caucasian-Logistic-Express would require the rehabilitation of the 20 t gantry crane or the use of a mobile container crane (taking into account the condition of the storage area/pavement). At Gyandsha, where this train shall also have a stop from April 1997, 20' containers can only be handled by working two cranes together synchronously. The decision on the installation of a 20 t crane depends on future traffic development.

The present condition of the terminal at Vanadzor permits the handling of a small number of containers only. The decision on rehabilitation depends on the projected traffic level.

Taking into account the present condition and the traffic forecasted, the rehabilitation of the terminals at Gyumri and Gori cannot be recommended.

Based on the present condition and taking into account the existing other container terminals in the region, it is considered unwise to make any proposal to complete and/or to rehabilitate the terminals at Abovian and Khirdalan.

1.1.5 Technical conditions of rolling stock

1.1.5.1 Introduction

The project „Joint venture(s) for the Caucasian Railways" can be regarded, in a certain sense, as a continuation as well as an extension of the project „Pre-investment study and pilot train Baku - Tbilisi - Poti/Batumi". There should be now created the preconditions for better transport connections between Europe and Middle Asia under integration of the transport capabilities of the Armenian Railway (ARM).
The Caucasian railways should now, after all the general political changes in the region, use and maintain their rolling stock for the own economic targets, as other comparable technical and constructional equipment too.
By the following studies the questions concerning the rolling stock should be investigated especially with the aim to define Joint Venture(s) for the needed future maintenance system.

For starting the investigations first a condensed overview about the rolling stock in the region and its technical condition as well as about the capabilities for its regular maintenance and their conditions had to be worked out. Doing that there could be used the given results of the corresponding investigations for the project mentioned above concerning the rolling stock of the Azerbaijan State Railway (AGZD) and Georgian Railway (GRZD).
Nevertheless in order to create a general overview it was necessary to add corresponding investigations about the rolling stock of the Armenian Railway (ARM), look to chapter 1.1.5.2.

The Interim Report closes here at first with the investigations to WP 1160 „Maintenance Technology for Rolling Stock" due to the lack of information concerning traffic forecast for the Armenian Railway.
The getting results are described in the chapter 1.1.5.3 „Technical condition of the rolling stock".
The chapter 1.1.5.4 „Maintenance of the rolling stock" contents the sections 1.1.5.4.1 „Locomotives", 1.1.5.4.2 „Wagons" and 1.1.5.4.3 „Coaches", at first ending up to now only with the subsections about the maintenance systems and the actual performances.
It is intended to add the above mentioned subsections of the chapter 1.1.5.4 after carrying out the investigations to WP 2250 „Maintenance Shop" and WP 3240 „Locomotive and Wagon Service and Maintenance" with the needed statements about the rolling stock as well as about the future needed maintenance system.

1.1.5.2 Armenian Railway (ARM)

1.1.5.2.1 Existing Situation

1.1.5.2.1.1 The locomotive fleet of ARM

The locomotive inventory of ARM amounts to a total number of 91 electric engines. This is divided into 47 VL-8 (52%) and 44 VL-10 (48%). The different types of locomotives and their location in the locomotives shops (depots) are shown in Annex 1.1-1. The age structure of the electric locomotives given in Annex 1.1-15 shows that all VL-8 are more than 26 years old whereas the VL-10 are 20 years old. The constructions of the types VL-8 and VL-10 are characterised by outmoded solutions for controlling systems and the lack of modern components and elements.
From all 47 electric locomotives type VL-8 and VL-10 out of order 30 locomotives should be reject whereas 17 are waiting for repair KR-1 to comply with the rules for service times for locomotives.
The question of replacement can be only investigated later within the context of future locomotive requirements.

1.1.5.2.1.2 Workshops for locomotives

The maintenance system of ARM for locomotives includes inspections (TO-1, TO-2, TO-3), overhauls (TR-1, TR-2, TR-3) and main repairs (KR-1, KR-2). The periods of these repairs depend on the running kilometres. The different maintenance types are shown in the following summary:

Tab. 1.1-7: Locomotive maintenance types

abbr.	running kilometres	(approximate time in operation)	type
TO-1			daily service
TO-2			weekly inspection
TO-3	11,000 km	monthly	monthly inspection
TR-1	22,000 km	after 2 months	first overhaul
TR-2	150,000 km	after 1.5 year	second overhaul
TR-3	300,000 km	after 3 years	overhaul with lifting
KR-1	600,000 km	after 6 years	first main repair
KR-2	1,200,000 km	after 12 years	general repair

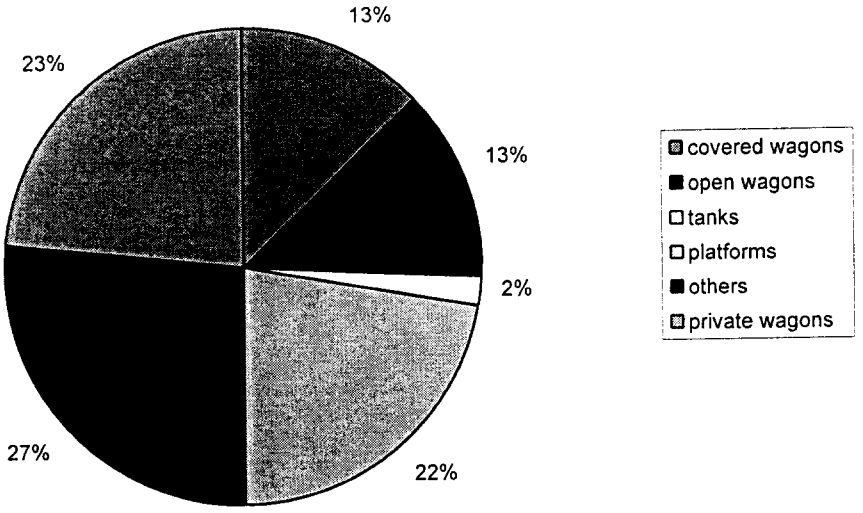
Only 2 locomotive depots of ARM perform maintenance services, Tshd Gyumri (44 locomotives) and Tshd Yerevan (47 locomotives).

There does not exist a normal workshop for the main repair categories KR-1 and KR-2. Thus, 17 locomotives require a KR-1. In December 1988 the Gyumri locomotive depot has been heavy destroyed by an earthquake. Afterwards the ARM rebuild the depot with new shops. Actually there are three working places under operation. The equipment with new cranes and lifting jacks gave the chance to carry out TR-3 (2 places) and KR-1 (1 place). As the ARM organised even this one working place inside the Gyumri depot in order to carry out KR-1 it was possible to avoid the extreme expensive repair outside the country.
The delay of TR-3 and KR-1 amounts to 64 locomotives.

1.1.5.2.1.3 Wagon stock

The wagon inventory of ARM amounts to a total number of 1,578 wagons, mainly with 2-axle bogies. The distribution of the different types is shown in the graphic below.

Fig. 1.1-6: Wagon stock split



The inventory in figures is shown in Annex 1.1-16.
The age structure of the wagons is not available from ARM as the data for all freight wagons used to be centrally processed in Moscow. Up to the present no inventory was carried out to determine the actual technical condition. Irrespectively of this fact the following statements briefly describe the situation:

- The age of the wagons is rather high, i.e. more than 20 years, except some special wagon types for bulk goods and containers.
- Wooden material is still being extensively used for doors, walls, floors and roofs.
- A small number of bogies is still equipped with sliding bearings for axle-boxes.

1.1.5.2.1.4 Workshops for wagons

The maintenance system of ARM for wagons includes inspections (TO, OR, TR) and repairs (DR, KR). For special wagons with unloading or other special equipment the periodic inspection (TR) is again divided in TR-1 and TR-2. The TR-2, DR and KR maintenance services are carried out at regular intervals. The maintenance types are shown in the table below.

Tab. 1.1-8: Wagon maintenance types

abbr.	type
TO	daily inspection in trains
OR	daily inspection and accidental repair outcoupled from trains
TR, TR-1	heavy damages, repair in depots
TR-2	after 3 months, regular inspection
DR	yearly repair after one or two years in depots
KR	main repair after 10 or 12 years in workshops

All 2 wagon repair workshops of ARM perform services, Vtshd Gyumri and Vtshd Yerevan. In 1996 (January to October), repair services included 365 wagons for annual repair (DR), 634 wagons for occasional repair (OR) and 609 inspections for prelongating the wagons service time (TR-2). Details of the actual number of wagons repaired are shown in Annex 1.1-17.

1.1.5.2.2 Bottlenecks of ARM rolling stock

1.1.5.2.2.1 Locomotive bottlenecks

The problems that ARM encounters concerning the number of required locomotives by daily performing trains, train performances and locomotive maintenance can be seen in the statistics for damaged locomotives as well as in the list of equipment needed for the locomotive shops. The problems are not quite obvious due to the actual low transport volume.

Locomotive fleet transport capacity

The ARM fleet has 91 locomotives of different types. In October 1996, the number of locomotives damaged each day reached an average of 47 locomotives, approximately 52% (see Annex 1.1-15). As a result of these facts, it can also be said that approximately 44 locomotives, i.e. 48%, are available for operations.
Details of the operating locomotives are shown in the table below.

Tab. 1.1-9: Locomotive operating stock

type of locomotive	operating locomotives	available number of locomotives
VL-8	6	24
VL-10	15	20

Locomotive stock maintenance

As mentioned above the main part of the locomotive fleet consists of the old fashioned VL-8 type (52%). The age of this type is the main cause of the generally bad maintenance situation for locomotives. The different maintenance measures for TO-1 to TR-2 are carried out in locomotive depots owned by ARM. Due to the lack of a workshop for main categories of locomotive repair in Armenia (KR-2) and to the limitation of capacity of KR-1 ARM used foreign workshops in the Ukraine, Georgia and Russia and had to pay for these services with foreign currency. The price is approx. US$ 200,000.00 for KR-1 and US$ 300,000.00 for KR-2.

Due to
- the political insulation with respect to the eastern neighbouring country
- the delay of spare parts and
- the lack of funds to pay for the main repair

presently only 44 locomotives (48%) are available while 47 locomotives are out of order.
In order to make up for the delay in maintaining the locomotive fleet, the following repairs should be carried out:

Tab. 1.1-10: Locomotive repair need

locomotive type	KR-1
VL - 8	8
VL - 10	9

Some figures regarding the present situation of technical reliability with respect to the locomotive fleet (see Annex 1.1-18) show the main reasons for brake downs up to October 1996. The main reasons are faults of the tracting engines in 28,5% of the cases, followed by speedometres in 27% of the cases.

1.1.5.2.2.2 Wagon stock bottlenecks

The problems that ARM always encounters with their wagon stock during daily train operations include loading, handling and maintenance. This can be seen in statistics on damaged wagons, in the list of equipment needed for the wagon repair shops, and in the list of required spare parts. The problems are not so obvious due to the present low transport volume.

Wagons stock transport capacity

The overall existing fleet on ARM net has a total number of 3,212 wagons of different types. In November 1996, the present number of damaged wagons reached an average of 2,402 wagons per day, i.e. approx. 74.8% (see Annex 1.1-19). According to the wagon type different damages occur. Annex 1.1-20 shows the different types of damage. This summary underlines the general high level of damaged freight wagons.
Particularly involved were coal wagons with 86.7%, platforms with 79.6% and cont-wagons with 77.2%. The other types with daily damage amounted to approximately half of their total number. As a result of these facts the operational freight wagon stock can be estimated as being 810 wagons, i.e. 25.2%. Details of operating stock are shown in the table below.

Tab. 1.1-11: Wagon operating stock

type of wagon	in operation in %	number of wagons
covered	18	218
platforms	20.4	82
open (coal)	13.3	133
tank	100	47
refrigerator	5.6	17
other	74.2	23
container	22.8	31
cement	57.6	136
grain	96.9	123

In order to estimate the number of wagons available per day it is necessary to take into consideration the percentage of wagons not available due to technical reasons or occasional repairs, i.e. DR and KR.
Normally this factor can be estimated as being 10%. Investigations made by ARM have also confirmed this factor as being 10%, with the conclusion that approximately 2,891 wagons could be available under normal conditions per day.
In order to estimate the actual possible daily freight volume which can be loaded the wagon turn-round should be taken into consideration. The wagons turn-round should be calculated as being the total time the wagon needs to turn round from the

beginning of one loading procedure to the beginning of the next one. This figure depends on the different specifications of the given railway system and varies according to each type of wagon. Usually, these figures can be obtained from the railway administration concerned.
For the different types of freight wagons the actual possible daily freight which can be loaded can be divided as follows.

Tab. 1.1-12: Daily possible load

type of wagon	number of wagons	wagons turn-round	daily available wagons	load of wagon in tons	daily possible load in tons [1]
covered	218	30	7	42	294
platforms	82	14.5	6	50	300
open (coal)	133	22	6	63	378
tank	47	9.6	5	57	285
refrigerator	17	11	1	40	40
container	31	14.5	2	62	124
cement	136	16	9	62	558
grain	123	8	15	42	630

The actual daily total volume of possible new loading capacities using the available stock can only reach a level of approximately 2,609 tons because only 787 wagons are taken into consideration[2].
As a result of the overall wagon availability 27 trains could be operated daily including approximately 2 trains from the possible new daily loading, every train consisting of approximately 30 wagons and a load capacity of approximately 1,300 tons. If the number of wagons were limited to 22 per train then the daily number of trains would be increased to 37 trains including 3 trains from the possible new daily loading, every train with a load capacity of approx. 900 tons.
This relatively low level of new daily loading capacity based on the available wagon fleet reflects the high level of wagon turn-rounds in the first 9 months of 1996 according to the information received from ARM. In this context it is important to mention that the main reason for the high wagon turn-round is the low train speed due to the speed restrictions on all sections of the line.

[1] The estimation was carried out by using a loading factor depending on the different wagon types.

[2] This estimation does not consider 31 so called "other" wagons not mentioned in the table above as under this term reference is made to a collection of special types with quite different parameters.

Wagon stock maintenance

As shown on the previous page the wagon stock contains 3,212 units. In order to maintain this stock it will be necessary to carry out annual repairs (DR) and main repairs (KR)[2] per year. The division of the wagons into the different types is shown in Annex 1.1-21. For the actual operating number of wagons there will be an annual requirement of 501 wagons for DR and 76 wagons for KR.
By comparing these figures with the actual performed repairs it is possible to use the following matrix to show the present maintenance situation.

Tab. 1.1-13: Present maintenance situation

kind of maintenance	DR	KR
maintenance carried out in 1996	365	0
actual yearly demand needed for the operating stock	501	249
estimation of capacity	not sufficient	not sufficient
yearly demand needed for the existing stock	1,674	76
estimation of capacity	not sufficient	not sufficient

The first urgent problem is the delay of the capacities to carry out all types of main repairs (KR) which are of importance to the maintenance system of all wagon types.

The second problem is the occasional urgent repair of the 2,402 damaged wagons located on sidings along the main lines. This question is to be investigated at a later date together with an undertaking to forecast the future wagon stock demands.

1.1.5.2.3 Definition of the volume of repair works

1.1.5.2.3.1 Repair works of the locomotives

In order to deal with the problems the locomotive service encountered during the last few years it is necessary to define the required locomotive demands followed by investigations as to how to develop the maintenance capabilities .

The future needed locomotive fleet

The required number of locomotives depends on the future train service demands inside the country and for the export needs which can be defined for freight train

services on the basis of the traffic forecast. In this context it was presumed that the infrastructural improvements will steadily decrease the speed restrictions which will result in even shorter and shorter wagon turn-rounds.
As up to now there was not given a forecast the problem of the needed fleet is further open.

The future maintenance capabilities for locomotives

As shown in item 1.1.5.2.1.2 the locomotive maintenance system is based on a general repair after 1,200,000 running km which means after approximately 12 years in service (ARM conditions).
Therefore, an annual number of 12 locomotives supplies the basic figures for the different maintenance levels: 70 TO-3, 63 TR-1, 4 TR-2, 2 TR-3, 1 KR-1 and 1 KR-2.
As ARM has 44 VL-11 and 47 VL-8 the total number of different maintenance types required should annually achieve the following values.

Tab. 1.1-14: Future locomotive maintenance volume

type	TO-3	TR-1	TR-2	TR-3	KR-1	KR-2
44 VL-10	256	231	15	**7**	**4**	**4**
47 VL-8	274	247	16	**8**	**4**	**4**

To cover the annual demand of KR-1 and KR-2 ARM should keep the traditional way of co-operation with other railway administrations, mainly with the neighbouring Georgian Railway (GRZD).

1.1.5.2.3.2 Repair works of the wagon stock

In order to solve the problems which the wagon service encountered during the last few years it is necessary to define the required wagon demands followed by investigations as to how maintenance capabilities can be developed.

The future wagon stock requirements

The number of wagons required depends on the future demands for freight train services inside the country and for the export needs. This can be defined according to a traffic forecast.
As up to now there was not worked out a forecast the problem of the needed wagon stock is further open.

The future maintenance capabilities for wagons

In order to organise a normal maintenance system for the wagons the respective capabilities are to be developed as follows:
- To establish the regular repair capacities (KR) as a short term measure
- To upgrade all existing repair capacities for occasional repair (TR) as a short term measure and depot repair (DR) as a middle term measure
- To cover spare parts requirements as a short term and a regular measure.

1.1.5.3 Technical conditions of the rolling stock

1.1.5.3.1 Locomotives

1.1.5.3.1.1 Parameters

The three Caucasian railways AGZD, ARM and GRZD performing the traction of passenger and goods trains by using the electric line locomotives VL-8, VL-10 and VL-11, all working with DC of 3 kV. As already mentioned in the report to the above mentioned project the designed solutions of these locomotives are characterised by a high age of the systems for controlling as well as by the lack of modern components and elements. A short reflection about the main technical data of the concerned locomotives is given in Annex 1.1-22.
It is essentially that the installed power per tons weight is comparable low as shown in the following overview.

Tab. 1.1-15: Locomotive power weight

Locomotive type	power per tons weight
VL-8	22.83 kW
VL-10	28.26 kW
VL-11	29.78 kW

These locomotives are able to develop tracting power up to 38..39 tons and can haul heavy trains up to 3000 tons. For tracting lighter trains, i.e. using the locomotives in the range of lower power, as usually today in Western Europe, these locomotives can be work only very inefficiently.
Modern electric locomotives of Western European railways with comparable power can develop tracting power only up to 21 tons, allowing trains weight up to about 2000 tons. These locomotives possess a weight of about 120 tons coming to an installed power of about 40 kW per tons weight. These locomotives are better adapted to the demand of tracting lighter goods trains.

As an example there should only be referred to the locomotive BR 156 of the DB AG. These locomotive possess an installed power of 5.880 kW and a weight of 120 tons coming to 49 kW per tons weight.

The locomotive stock

In general the three Caucasian railways possess 547.5 electric line locomotives as follows.

Tab. 1.1-16: Locomotive inventory stock

	VL-8	VL-10	VL-11	Subtotal
AGZD	183	-	43	226
ARM	47	44	-	91
GRZD	85	103	42.5	230.5
Total	**315**	**147**	**85.5**	**547.5**

The mentioned line locomotives are all too old except the younger VL-11. The age structure of the locomotives is given in Annex 1.1.-23.
Coming from the age structure a main drawback is recognisable above due to the timely irregular procurement of new locomotives and their age. 158 locomotives (28,9%) are 21 years and more old, among these 36 (6,6%) 35 years and more old.

1.1.5.3.2 Wagons

1.1.5.3.2.1 Parameters

The wagon stock includes only wagons with bogies, mainly with 4 axles. The weight is about 22 tons and the load about 65 - 70 tons. Furthermore there exists a small amount of special wagons with 8 axles. Their weight is 44 tons and the load is 105 tons. All wagons are designed corresponding to the technical standards of the former Soviet State Railway and they can operate within the whole railway net of all CIS railways. The wagons are equipped with automatic central buffer couplings.
The average age of the wagons is more than 20 years with the exception of some special wagons for bulk goods and container transport. Wooden material is extensively used as constructional material for wagons like doors, walls, floors and roofs. A small amount of bogies is still equipped with sliding axle boxes.

The wagon stock

The stock of wagons of the three Caucasian railways amounts to a total of 53,425 wagons. The existing stock in different types is given in Annex 1.1-24.

1.1.5.3.3 Coaches

1.1.5.3.3.1 Parameters

The coaches stock of the Caucasian railways contents only cars with bogies and 4 axles with automatic central buffer couplings. In the opposite to the wagons the coaches are additionally equipped with side buffers in order to stabilise laterally the longitudinal movements within the passenger trains.
The coaches types are given in the following overview.

Tab. 1.1-17: Coach types

ZMO	coach with middle corridor (open type)
ZMK	coach with compartments
ZMKR	coach with compartments and radio comp.
ZMR	restaurant car
SW	sleeping car (weak car)
ZMB	luggage car

The coaches are designed in the majority corresponding to the valid maximum clearance of the CIS standard. Only the SW coaches are exceptionally constructed corresponding to the RIC standard. The ZMK, ZMKR, ZMR and SW coaches were designed and built in the former GDR whereas the other coaches were manufactured by the coaches factory in Twer (Russia).

The coaches stock

The overall stock of the three Caucasian railways amounts to 2,123 coaches. A detailed overview is given in the following summary.

Tab. 1.1-18: Coaches stock

	AGZD	GRZD	ARM	Total
ZMO	407	508	131	**1,046**
ZMK	269	404	97	**770**
ZMKR	43			**43**
ZMR	30	35	17	**82**
SW	30	65	25	**120**
ZMB	39	15	8	**62**
Total	**818**	**1,027**	**278**	**2,123**

Resulting from the actual traffic insulation the coaches stock is under operation only to a small amount.

1.1.5.4 Maintenance of the rolling stock

1.1.5.4.1 Locomotives

1.1.5.4.1.1 Maintenance system and performances

The maintenance system of the Caucasian railways contents inspections (TO-1, TO-2, TO-3), overhauls (TR-1, TR-2, TR-3) and main repairs (KR-1, KR-2). The periods of these repairs depend on the running kilometres. The different maintenance types are shown in the following summary.

Tab. 1.1-19: Locomotive maintenance scheme

abbr.	running kilometres	(approximate time in operation)	type
TO-1	daily	-	daily service
TO-2	weekly	-	weekly inspection
TO-3	monthly	11,000 km	monthly inspection
TR-1	after 2 months	22,000 km	first overhaul
TR-2	after 1.5 year	150,000 km	second overhaul
TR-3	after 3 years	300,000 km	overhaul with lifting
KR-1	after 6 years	600,000 km	first main repair
KR-2	after 12 years	1,200,000 km	general repair

For carrying out the maintenance of the coaches the railways in the region possess 10 locomotive depots and 2 repair factories.
Basing on this maintenance scheme of the existing locomotive stock the regularly needed volume of the different maintenance types can be determined. At least 3,194 TO-3, 2,874 TR-1, 183 TR-2, 91 TR-3, 46 KR-1 and 46 KR-2 should be done per annum. The particular amounts of the different locomotive types are shown in the following summary.

Tab. 1.1-20: Locomotive repair volume

	Total	TO-3	TR-1	TR-2	TR-3	KR-1	KR-2
VL-8	315	1.838	1.654	105	53	26	26
VL-10	147	858	772	49	25	12	12
VL-11	85,5	499	449	29	14	7	7
Total	**548**	**3.194**	**2.874**	**183**	**91**	**46**	**46**

Due to the lack of heavy cranes and lifting jacks in the depots there are existing drawbacks of TR-3 with 159 locomotives. The maintenance types KR-1 and KR-2 were carried out in the past only abroad, excepted small capabilities in Tbilisi (1 place) and Gyumri (1 place). Thus, totally 224 locomotives require these maintenance types.

The expense for catching up these drawbacks is to add to the regular planned maintenance types.

1.1.5.4.1.2 Future transport volume and needed locomotive fleet

Is still open regarding to the remarks under point 1.1.5.1.

1.1.5.4.1.3 Future needed maintenance system and investment plans

Is still open regarding to the remarks under point 1.1.5.1.

1.1.5.4.2 Wagons

1.1.5.4.2.1 Maintenance system and performances

The maintenance system for wagons includes inspections (TO, OR, TR) and repairs (DR, KR). For special wagons with unloading or other special equipment the periodic inspection (TR) is again divided in TR-1 and TR-2. The TR-2, DR and KR maintenance services are carried out at regular intervals. The maintenance types are shown in the table below.

Tab. 1.1-21: Wagon maintenance scheme

TO	daily inspection in trains
OR	daily inspection and accidental repair outcoupled from trains
TR, TR-1	heavy damages, repair in depots
TR-2	after 3 month, regularly inspection
DR	yearly repair after one or two years in depots
KR	main repair after 10 or 12 years in workshops

There are existing 11 wagon depots for carrying out the repair of wagons (TO to DR), 5 of them at the AGZD, 4 of them at the GRZD and 2 at the ARM. Furthermore in the region there exists the Baku Wagon Repair Shop (BWRS) specialised for repairing tanks (KR).
Basing on this maintenance scheme of the existing wagon stock the regularly needed volume of the different maintenance types can be determined. At least 45,663 TR-2, 48,767 DR and 4,658 KR should be done per annum. The particular amounts of the different wagon types are shown in the following summary.

Tab. 1.1-22: Wagon repair volume

	Total	TR-2	DR	KR
covered, open, flats, conts	34.360	0	31.497	2.863
tanks	7.238	21.714	6.514	724
refrigerators	2.847	8.541	2.610	237
cement	2.031	6.093	1.828	203
cereal	3.105	9.315	2.795	311
others	3.844	0	3.524	320
Total	**53.425**	**45.663**	**48.767**	**4.658**

Besides these needed regular maintenance types for the existing wagon stock, due to different reasons like war, earthquake, theft and so one 35,522 wagons are damaged and cannot operate; the expense for catching up these drawbacks is to add to the regular planned maintenance types.
The performances of wagon repair services for the first 5 month of 1996 are shown in the following summary.

Tab. 1.1-23: Repair performances

	TR	DR	KR
01 - 05 /1996	1,969	1,245	208

1.1.5.4.2.2 Future transport volume and needed wagon stock

Is still open regarding to the remarks under point 1.1.5.1.

1.1.5.4.2.3 Future needed maintenance system and investment plans

Is still open regarding to the remarks under point 1.1.5.1.

1.1.5.4.3 Coaches

1.1.5.4.3.1 Maintenance system and performances

There are existing 3 coaches depots in order to carry out the repair of coaches (TO to DR), 1 of them at each railway. Furthermore there exists the Tbilisi Electro Wagon Repair Shop (TEWRS) in the region specialised for repairing EMU (KR-1 and KR-2). Basing on this maintenance scheme of the existing coaches stock the regularly needed volume of the different maintenance types can be found. At least 1,600 DR, 400 KR-1 and 123 KR-2 should be done per annum. The particular amounts of the different wagon types are shown in the following summary.

Tab. 1.1-24: Coach repair volume

	Total	DR	KR-1	KR-2
ZMO	1,046	795	199	52
ZMK	813	607	152	54
ZMR	82	61	15	5
SW	120	90	22	8
ZMB	62	47	12	3
Total	**2,123**	**1,600**	**400**	**122**

1.1.5.4.3.2 Future transport volume and needed coaches stock

Is still open regarding to the remarks under point 1.1.5.1.

1.1.5.4.3.3 Future needed maintenance system and investment plans

Is still open regarding to the remarks under point 1.1.5.1.

1.2 Organisational, legal and financing conditions

The following paragraphs analyse the present organisational, legal and financing conditions of the railway administrations, giving some outlooks for necessary improvements and adjustments. This analysis is carried out in the view of the envisaged joint ventures in the field of infrastructure. However, as infrastructure is still an integrated part of the railways, being not yet separated from the traffic and service components, the organisational and financial analysis apply to the railway administrations as a whole. For reasons of confidential treatment, the financial analysis (chapter 1.2.3) is carried out for each railway administration separately.

1.2.1 Legislation on railways and enterprises

1.2.1.1 General overview on legislation

The juridical situation of the railways ARM, AGZD and GRZD is influenced by the following circumstances:

- The railway construction and operation rules of FSU and the international railway conventions of OSShD continue to be valid.
- National regulations for the legal status, organisation, management, and financing of the railways are being created.
- Certain regulations of FSU ceased to be valid without being duly replaced (e.g. in seaports).
- As a result of the new sovereignty, rules have been introduced for objects of legislation not yet necessary (e.g. border controls, customs).

That means: The legislation is in flow. The further development should be influenced.

There exists still a legal unity for the 3 Caucasian railways. However, it is increasingly challenged by the creation of national laws having priority towards the uniform law. The problem is recognised in the Caucasus region: the governments and the railway administrations take care to maintain the uniform rules, at least to modify them only by mutual agreement.

The managers in the Caucasian ministries of transport and in the railway administrations are unsure. The interviews held with them in the 3 states resulted in an uncertainty with regard to

- the decisions of the lawmakers in the national scope and
- the political development in the Caucasus region in the international scope.

All the interviewed persons declared to be willing to cooperate with the other Caucasian railways in the present frame. Objections were raised to closer contact. A

few think that the efforts of TRACECA are futile as long as the war-like situation persists.

The Statements of Endorsement, dated 22.09.1995, on cooperation of the 3 Caucasian states in the transport sector are assessed obligating in Armenia and in Georgia. In Azerbaijan, the realisation is considered dependent on the evacuation of the territories occupied by Armenia.

In the 3 Caucasian states, the railways are government enterprises, what is fixed in the constitutions. The state railway is the only railway in each country, it has a line and a operation monopoly. At present, the privatisation of the state railways is excluded by law. It should be examined how this hard and fast rule may be livened up.

In the Caucasus region, there are no private railways, only works sidings and rail connections.

The general framework of the FSU railway law, dated 15.04.1991, is still applied in the Caucasus region. However, Georgia has enforced a new railway law in 1994. In Armenia a general transport law and a railway law have been drawn up, in Azerbaijan a transport law that includes the ferry boat transports. The object of these laws is to replace the Soviet railway legislation and shall result in drifting apart of the present legal status of the 3 railways.

The international cooperation of the Caucasian states in the railway scope is still underdeveloped, compared with that in Western Europe.

Conventions of states or governments

(a) Organisation for the cooperation of railways (OSShD):

members are the Republics of Azerbaijan and of Georgia. The Republic of Armenia is represented by Russia. OSShD continues the conventions on the international railway transport of passengers (SMPS) and of goods (SMGS). These conventions are to be applied for railway transports between the Caucasian states themselves, between these states and the other CIS, and other eastern European and Asiatic states.

(b) Common meeting of the heads of governments of the CIS member states having created the Council for Rail transport, dated 20.3.1992. This Council is not based on an international treaty but on the agreements of the governments. Presently, the general managers of the CIS railways are representing their governments in the meetings of the Council. They decide on the maintenance or continuation of the common rules and, eventually, on their modification in mutual agreement. The governments of Armenia, Azerbaijan and Georgia are members of this Council."

(c) Treaty between the Republics of Azerbaijan, Georgia, Uzbekistan and Turkmenistan, dated 13.05.1996, on Coordinating the activities of rail transport.

(d) Agreement between the Republics of Azerbaijan, Georgia, Uzbekistan and Turkmenistan, dated 13.05.1996, on Cooperation in the area of regulating transit transports.

(e) Agreement on mutual relations in the area of international rail transport between the Republics of Azerbaijan, Georgia, Uzbekistan and Turkmenistan, dated 13.05.1996.

Conventions of railways

(a) International Railway Union (UIC). ARM and AGZD are associated members, GRZD is not yet.

(b) According to the resolutions of OSShD (see above „Conventions of states or governments", (a), the following regulations are applied by the 3 Caucasian railways:

- the uniform transit tariff (MTT) to the convention SMGS,
- the tariffs for the transport of passengers, luggage and express goods,
- the instructions to the conventions SMGS and SMPS,
- the regulation concerning the use of wagons in the international rail transport (PPW),
- the instructions for the accounts in the international rail transport of passengers and goods.

(c) According to the resolutions dated 13.05.1996 (see above „Conventions of states or governments", (c) and (e) the following regulations continue to be valid for the railway enterprises of Azerbaijan, Georgia, Uzbekistan and Turkmenistan (not for Armenia):

- the FSU railway law,
- the regulations on railway operation,
- the technological relations,
- the assessment of the liability of railway in the case of deviation of regular operation,
- the regulation concerning the acquisition and the repair of rolling stock, containers, equipment etc.
- the assessment to timetables and to main routes,
- other regulations according to para. 2 to 5 of the agreement.

The Joint Ventures must take into account these conventions. However, they may be developed further on.

1.2.1.2 Review of legislation in each country

Laws and drafts of laws of the 3 Caucasian states which are relevant for the activities of enterprises in general and of railways in particular are reviewed in the following, country by country,

1.2.1.2.1 Legislation in the Republic of Armenia

- Law on enterprises and entrepreneurial activities, dated 14.03.1992,
- Regulation on foreign trade activity, dated 13.02.1993,
- Law on foreign investments, dated 31.07.1994,
- Law on privatisation and denationalisation, dated 20.03.1996
- Draft of a transport law (1996),
- Draft of a railway law (1996),
- Draft of a Civil Code (in preparation).

The common law of Armenia is to be applied in the scope of industrial safety and work place safety, the environmental care, the liability, the insurances, the taxes and duties, and the border controls.

The staff of the ARM is subject to the general legislation for the employees of the state.

The FSU Civil Code is still applied.

1.2.1.2.2 Legislation in the Republic of Azerbaijan

- Law about entrepreneurial activities, dated 15.02.1992,
- Law about property in the Republic of Azerbaijan,
- Law on the protection of foreign investments, dated 15.01.92
- Law about privatisation of state property, dated 07.01.1993,
- Law about enterprises, dated 01.07.1994,
- Law about Joint stock company, dated 12.07.1994,
- Law on state registration of legal entities, dated 06.02.96,
- Draft of a transport law (1996).

The common law is applied on railway activities as in Armenia (see 1.2.1.2.1).

1.2.1.2.3 Legislation in the Republic of Georgia

- Railway Law, dated 28.10.1994 (an amendment is in preparation which shall separate the competences between the railway policy (supervision by the ministries) and the railway management)
- Law on entrepreneurs (1996)
- Law on promotion and guaranties of investments activity (with amendment in 1996)
- Antimonopoly Law dated 25.7. 1996
- Draft of Transport Law (1997)
- Draft of Civil Code (in preparation).

The common law is applied on railway activities as in Armenia (see 1.2.1.2.1).

1.2.1.3 Conditions for a joint railway infrastructure authority

The infrastructures are a constituent part of the Caucasian state railways. There are privatisation programmes in the 3 states, but the railways are excluded. The railway laws (resp. the drafts of them) concede no special juridical position to the railway infrastructure - neither with regard to the legal status nor to the organisation nor to the financing of investments. In none of the Caucasian states the legislation provides the separation between the operational and the infrastructure activities as required in Art.6 of the directive 91/440/EEC.

In the 3 states the railway enterprises founded affiliated enterprises in the legal form of private enterprises, but up to now in peripheral areas of the railway only (e.g. schools, social services), and not in the core of their activities. However, it must be examined to which extent the legislation hinders or excludes to separate areas or activities from the infrastructure, and to introduce them into a Railway Infrastructure Authority, or to make them objects of a Joint Venture. In the case of activities, such as the purchase or the production of materials, the maintenance of the track system or the signalling or the telecommunication systems, the separation should be permissible. The investigation if the railway lines in their entirety may be separated, must be deepened. At present, amendments to the legislation seem imperative.

The conditions of railway infrastructure in the 3 Caucasian states regarding international cooperation and agreements are reviewed hereafter, country by country.

1.2.1.3.1 Armenia

Organisation

The ARM have no homogenous administration of their infrastructure. It is assigned to the Operative Services in the transport, track maintenance, energy supply, telecommunication and signalling engineering divisions. The production and construction services form a special organisational unit. The responsibility for safety, economic efficiency, staff, and financing is splitted. The drafts of the Armenian transport law and railway law do not provide modifications of the legal or institutional organisation of the ARM infrastructure.

Cooperation

Regarding the Armenian legislation, the possibility for the ARM to be a partner of a Railway Infrastructure Authority is limited. The area of competence of such a body ought to be concretely defined. Further investigations are necessary.

International agreements

Unlike Azerbaijan and Georgia, Armenia is neither member of OSShD nor partner state of the treaties on corridor transports, dated 13.05.1996. The railway regulations of the FSU are applied habitually in Armenia. No agreements with other states or railway administrations exist concerning the operation, the maintenance and the technology of the railway infrastructure.

1.2.1.4 Azerbaijan

Organisation

The AGZD is a state enterprise as defined by Art.6 of the law about enterprises. It is a legal person. In the General Directorate of the AGZD, the engineering department is competent for the infrastructure. For financing, economic efficiency, and staff the special departments are competent. The draft of the transport law does not provide for changes of this organisation.

Cooperation

The laws dealing with enterprises and the Joint stock company enable the establishment of companies as legal persons authorised to manage the state property. Hitherto, AGZD has founded numerous affiliated companies, all alone, e.i. without partners. The participation of foreign enterprises in such companies is not excluded. For certain activities a license is demanded according to the special legislation of Azerbaijan. The property used by AGZD, by the Caspian Shipping Company or by their branches, subsidiary and affiliated companies belongs to the state. It is not allowed to contribute it to an enterprise, because the privatisation of railway assets is excluded. A solution of this problem is to be investigated.

International agreements

The Republic of Azerbaijan is member of OSShD and party to the treaties dated 13.05.1996 about the corridor transports.

The AGZD is partner of the Council for rail transport and is associated member of UIC. This situation can be a good starting point for a joint venture of the Caucasian railways.

1.2.1.5 Georgia

Organisation

In the headquarters of GRZD and in the regional divisions 2 different organisational units are competent for the infrastructure. They are the divisions "principal engineer" and "civil engineering". Financing, personal and social matters, economic efficiency are assigned to other special services.

Cooperation

Hitherto, the law concerning entrepreneurs was not yet applied to the GRZD though it admits the foundation of affiliated companies as legal persons. Partners of such enterprises may be foreign enterprises or investors. In the legal form of a Limited Liability Company or a Stock Company these enterprises or joint ventures may have property of their own. Even railway assets are not excluded as property of them. The establishment of a Railway Infrastructure Authority is possible from the point of view of the Georgian legislation. In certain cases (e.g. telecommunication) a license is essential.

International agreements

Georgia is represented in the Council for rail transport. It is member of the OSShD and party of the treaties on the corridor transports dated 13.05.1996.

GRZD is not member of UIC.

1.2.2 Analysis of present organisation

1.2.2.1 The infrastructure of the three Caucasian railways.

The infrastructure is a constituent part of the 3 Caucasian state railways. There are privatisation programmes in the 3 states, but the railways are excluded. The railway laws resp. the drafts of them concede no juridical position to the railway infrastructure - neither with regard to the legal status nor to the organisation nor to

the financing of investments. In none of the Caucasian states the legislation provides the separation between the transport and the infrastructure activities as required in Art.6 of the directive 91/440/EEC.

1.2.2.2 Present organisation

1. The notion "infrastructure" is not defined in legal regulations of the 3 Caucasian states. In the FSU law, dated 15.4.1991 and still valid in Armenia and in Azerbaijan, and in the Georgian railway law the notion "infrastructure" is not known, too. Therefore, the definition must be found in direction to the purpose of the infrastructure for a railway enterprise, and with reference to the directives 91/440/EEC and 95/18/EC. In this sense, infrastructure means the permanent way, the track superstructure, the artificial structures, the platforms in the stations, track installations, rail communication installations, other structures, buildings and the security zones, and the land occupied by these assets.

2. Like the railway entities themselves, the state infrastructures of ARM, AGZD and GRZD may not be privatised (Armenian law of 20.3.1996, Azerbaijan law of 7.1.1993, Georgian railway law of 28.10.1994). However, the 2 first mentioned laws are limited to 1998, and the Georgian law may be amended in 1998.

The infrastructures are integral parts of the respective national railway enterprises. There are no juridical relations to the transport divisions of the railway administrations whose trains use the infrastructure. However, in Azerbaijan a special unit for the passenger traffic has been established in 1996, and in Armenia the institution of such a unit is planned (March 1997). The "contracts" to be engaged with the passenger traffic units have no juridical character, they are internal provisions.

The infrastructure of the 3 Caucasian railways is a state monopoly. It is prohibited to other persons to use the infrastructure with own trains or tractive vehicles. Therefore, no rules exist about the access of other railway entrepreneurs to the national infrastructures in the 3 states. Privately owned wagons which are immatriculated at any railway administration, and railway vehicles belonging to foreign railway administrations may use the infrastructure according to international conventions.

3. The organisation of the 3 Caucasian railways is presented in the Annexes 1.2-8 to 1.2-10. It can be seen that in none of the 3 railway enterprises a special organisational unit "infrastructure" exists. Most activities concerning the infrastructure are organisationally connected with other activities of the railway administrations. On the other hand, several administration departments and divisions are competent/responsible for the administration and the operation of the infrastructure.

The internal structures of the 3 railways were developed by the FSU railway organisation. They are similar. Therefore, it is possible and suitable to refer to uniform problems of the 3 railways in the following explanations.

3.1. The notion "administration of the infrastructure" means in juridical sense:

- planning, construction schedule,
- acquisition of land (real estates),
- tendering (purchase and production of materials),
- performance, supervision and acceptance of works for repair, maintenance, reconstruction and renewal,
- inspection of lines, drainage of lines,
- use of dynamometer wagons etc.

3.2. The notion "operation of the infrastructure" means in juridical sense:

- slot management,
- disposal of lines and slots to train movements,
- telecommunication and signalling,
- operation of the level crossings,
- supervision of the trains' running,
- throwing of the points,
- power supply (on electrified lines) etc.

3.3. The administration and the operation of the infrastructure include personnel, financial, legal and computer service activities.

4. The organisational form of the 3 Caucasian railways is a bureaucratic one. It must be understood as the structure of a state monopoly for which the infrastructure is not a market object: it is used by itself exclusively. Every department/division of the railways is competent for all activities which concern its tasks and its respective assignment in the entities. However, in Azerbaijan the new passenger traffic unit is independent from the decisions of the departments in the AGZD headquarters (HQ). In Armenia, the ARM plans a similar unit (see no.2). This organisational form should be developed and applied in other services of the 3 railways, too.

Most of the local units (stations etc.) of the 3 railways are subordinated not to one but to several departments/divisions: e.g. the stations to the transport division, to the wagon division and to the freight traffic division. Few units (e.g. the permanent way districts) are subordinated to one service only.

This structure is not efficient: it is an inheritance of the FSU railway organisation.

In Azerbaijan, there are 3 regional divisions (Baku, Gyandsha, Nakhichevan), in Georgia there are 4 (Batumi, Khashuri, Samtredia, Tbilisi).

1.2.2.3 Staff of the three Caucasian railways

The total number of the personnel of the 3 railways is listed , and its attribution to the infrastructure activities is presented in the Annexes 1.2-11 and 1.2-12.

The repartition of the actual personnel numbers and their attribution to the different activities of the railway enterprises is somewhat difficult. Tables or lists about it do not exist. The part of the staff working for the infrastructure can be calculated for many units. However, some figures must be estimated.

1.2.2.4 Foundation of branches, subsidiary and affiliated enterprises

ARM, AGZD and GRZD have founded organisational units in the form

- of state enterprises: some of them are juridical persons. Their foundation is possible without special approval by the government.

- of private companies: such enterprises were founded up to now in peripheral areas only (e.g. hospitals, schools, and the joint stock company AZRAIL of the AGZD) and not in the core of the railway activities.

The AGZD unit "passenger traffic" is a legal person. It is a state enterprise, not a private company. This legal form is excluded by the Azerbaijan legislation.

It must be examined to which extent the legislation hinder or exclude the separation of areas or activities from the infrastructure, and to introduce them in a Railway Infrastructure Authority, or to make them objects of Joint Ventures. In the case of activities such as the purchase or the production of materials, the maintenance of tracks, of signalling or telecommunication systems, the separation should be permissible. The investigation if a railway line in their entirety may be separated, must be deepened. At present, amendments to the laws seem imperative. The draft of the Armenian transport law provides licences for certain transport activities. The licensed enterprises or subsidiaries may be privatised, even in the railway sector. However, the definitive draft of this law is not yet available.

1.2.2.5 Railway infrastructure in the three Caucasian states

1.2.2.5.1 Armenia

Organisation

The ARM have no homogenous administration of their infrastructure. In the headquarters, it is assigned to the operate services in the transport, the track maintenance, the energy supply, the telecommunication and signalling engineering divisions. The production and construction services form a special organisational unit. The responsibility for safety, economic efficiency, staff, and financing is splitted. The drafts of the Armenian transport and railway laws do not provide for modifications of the legal or the institutional organisation of the ARM infrastructure.

The organisation of the ARM is not fixed by the legislation. Therefore, no legal problems would exclude or hinder any modifications of it.

In the local organisation, the assignments related to the infrastructure are attributed to 4 permanent way districts, 1 track construction workshop, 76 stations, 3 power current districts, 2 telecommunication districts, and to 1 enterprise for material-technical supply. In the headquarters of the ARM, each of the 5 departments is competent for infrastructure problems:

- in the financial and economic department: each of the 4 divisions,
- in the operations department: the transport, the track and the energy supply divisions,
- in the communication and foreign affairs department: the telecommunication and signalisation division,
- of the divisions attached to the general manager: the personnel, the legal and the technical production divisions.

Most of these units have not only tasks concerning the infrastructure, but also other duties. Therefore, they are partially employed with infrastructure tasks. However, it is to remark that the local units which are established as affiliated enterprises have their own personnel service. The other local units of the ARM refer to the "personnel department" of the HQ.

Cooperation

Regarding the present Armenian legislation, the possibilities for the ARM to become a partner of a Railway Infrastructure Authority or of Joint Ventures, are limited. The area of the competence of such a institution ought to be concretely defined. The unit "passenger traffic" planned by the ARM shall be founded in the legal form of a state enterprise without participation of other companies.

International agreements

Unlike Azerbaijan and Georgia, Armenia is neither member of the OSShD nor partner state of the treaties on corridor transports, dated 13.5.1996. The railway regulations of the FSU are applied habitually in Armenia. No arrangements with other states or railway administrations exist concerning the technology, the maintenance or the operation of the railway infrastructure.

1.2.2.5.2 Azerbaijan

Organisation

The AGZD is a state enterprise as defined in Art.6 of the law about enterprises. It is a juridical person. In Annex 1.2-9 the structure of the AGZD headquarters is shown in detail. The following divisions of the AGZD headquarters are competent for infrastructure activities:

- In the engineering department: the civil engineering and construction division (Azjel-dor-stroy) and the railway track division (Az-stroy-put; 15 permanent way districts are subordinated to this division); they are juridical persons, too.
- The general construction division.
- The informatic and research service.
- The projection unit.
- The material service (subordinated to the General Manager); it provides the procurement (purchase, production) and the administration of the material.
- The power supply (AGZD has own power plants).

For financing, economics, personnel, legal consulting and controlling the special services of the AGZD HQ are competent.
The operation of the infrastructure is realised by the "operation department". On the other hand, the "technical department" has no competence in infrastructure activities.

This organisation form is complicate. It is well understood that the economic autonomy of the Azjel-dor-stroy and Az-stroy-put divisions is limited.

Regional divisions of the AGZD are established in Baku, Gyandsha and Nakhichevan.

The draft of the transport law of Azerbaijan does not provide to change the actual organisation of the AGZD. However, the legislation does not exclude or hinder any modification of this organisation.

Cooperation

The Azerbaijan laws about enterprises and about the Joint Stock Company enable the establishment of companies as legal persons authorised to manage the state property. Hitherto, AGZD has founded numerous affiliated enterprises. In the legal form of a joint stock company only one enterprise with a minority participation of the AGZD has been founded, the AZRAIL. The foundation has been realised in 1994, that means: before the law on enterprises became valid. Since 1995, the AGZD can participate only in joint stock companies whose majority of shares belongs to the state.

The participation of foreign enterprises in such companies is not excluded. For certain activities a licence is demanded according to the special legislation of Azerbaijan.

The property used by AGZD, by the Caspian Shipping company or by their branches, subsidiary and affiliated companies belongs to the state. It is not allowed to attribute it to an enterprise, because the privatisation of railway assets is actually excluded. A solution of this problem is to be investigated. Perhaps, the next privatisation law (provided validity: 1999 and following years) will favour this solution.

International agreements

The Republic of Azerbaijan is member of OSShD and party to the treaties dated 13.5.1996 about the corridor transports. The AGZD represents the Azerbaijan government in the Council for Rail Transport and is associated member of the UIC. However, there are no conventions or agreements with states, governments or railways concerning the railway infrastructure.

1.2.2.5.3 Georgia

Organisation

The organisation of the GRZD was modified in the last 2 years. The modification at the end of 1996 created many new structures. For the organisation of the "Georgian Railway Administration" please see Annex 1.2-10. The organogramme shows 48 units, of which 22 form the "Georgian Railway Department". The other units are subordinated to the General Manager and to the Deputy Managers, too, but they are working in non-railway activities. The attribution of the organisational units to the General Manager or to the Deputy Managers is hardly to understand. For the infrastructure activities, different organisational units are competent. Most of them are also employed with other duties.

Since 1.1.1997, there are 4 regional divisions in Batumi, Samtredia, Khashuri and Tbilisi. The directions in Batumi and in Khashuri have been established at this date. The internal organisation of these regional directions corresponds to that in the HQ. At the local level, many technical district units were suspended by the 1.1.1997; their staff belongs now to special services in the general administration. At present, no detailed data on the new service units is available.

Cooperation

Hitherto, the law about entrepreneurs was not applied to the GRZD. Though it admits the foundation of affiliated companies as legal persons. Partners of such enterprises may be foreign enterprises or investors. In the legal form of a Limited Liability Company or a Stock Company these enterprises or joint ventures may have property of their own. Even railway assets are not excluded as property of them. The establishment of a Railway Infrastructure Authority or of Joint Ventures is possible from the point of view of the Georgian legislation. The application of it would be more favourable than that of Armenia or Azerbaijan, because the flexibility of the Georgian legislation reached a higher degree.

International agreements

Georgia is represented in the Council for Rail Transport by its GRZD. It is member of the OSShD and party of the treaties on the corridor transports dated 13.5.1996. GRZD is not yet member of UIC.

1.2.2.6 Points of intersection

1. When a Railway Infrastructure Authority and/or Joint Ventures are to be founded it will be necessary first of all, to fix the points of intersection between the new institutions and the basis railway enterprises (entities). Such intersection could concern

1. the tendering (procurement - purchase or production -) of materials for repair, maintenance, reconstruction etc. of railway assets (e.g. for sleepers, for telecommunication, for signalisation, or for energy supply).
2. the repair, maintenance etc. of the infrastructure assets.
3. the operation of the infrastructure in the sense of the directives 91/440/EEC and 95/18/EC (see 1.2.2.2).

The number of staff for the intersection no. 3 corresponds to the actual figures calculated for the infrastructure activities in the Annexes 1.2-11 and 1.2-12. For the intersections no.1 and no.2, it is considerably lower.

To avoid misunderstanding it is emphasised that the numbers of staff in the annexes do not explain the number of personnel necessary for the activities of any Railway Infrastructure Authority or Joint Venture.

2. As for the infrastructure of the Caucasian railways (see 1.2.2.5) similar intersections could occur for Joint Ventures concerning the railway locomotives, coaches and/or wagons. These activities could be yielded to enterprises under the same conditions. The points of intersection should be defined clearly.

1.2.2.7 Further proposals.

The analysis of the present organisation of the 3 Caucasian railways, especially with regard to the infrastructure shows that it is very complicated. The staff expenditure is high. Proposals are to be made which are based on organisation schemes reflecting the market activities of profit guided railway companies more properly.

1.2.3 Financial analysis of the Armenian Railway

1.2.3.1 Financial overview

1.2.3.1.1 Assets and liabilities

The balance sheets of the years 1994, 1995 and 9 months 1996 are given in Annex 1.2-1. The current re-evaluation of the fixed assets took place by applying official coefficients, which shall have compensated the effects of inflation. The book values which have come out of this exercise do not seem to reflect actual values and the acquisition values are obviously underestimated. A breakdown of the official acquisition values of the assets at the end of 1994 and 1995 is given in Annex 1.2-2. At the end of 1995, total physical assets had an acquisition value of only 20.2 Million US$, of which 61% were for permanent ways and 15% for the rolling stock.

Armenian Railways have high outstanding debts, which are coming partly from Soviet times and partly from big customers (particularly the State owned gold mining and refining company Armgold), the total being about 2.2 Billion Dram (about 4.9 Million US$), which is about 55% of the annual sales.

1.2.3.1.2 Costs and revenues

According to the profit and loss statements annexed to the balance sheets (Annex 1.2-3), receipts for main activities, net of value added tax, amounted to 3,399 Million Dram (8.2 million US$) in 1996, against costs of 3,702 Million Dram (8.9 Million US$), leaving a loss of 303 Million Dram (732,400 US$). The revenues shown in the profit and loss statements are only those actually received. The sales which remained unpaid were not counted. Of the total receipts of 3,399 Million Dram in 1996, 2.606,2 Million were for goods transport, 103,6 Million for passenger transport and 689.2 Million for other services (side and service activities, such as electricity and water sales).

On the average of the first 9 months of 1996, Armenian Railways employed a staff of 3,753 (down from 4,542 in 1993), which performed on average about 94,000 tkm per person, if passenger traffic is neglected.

Clearly understated cost levels exist for the following items:

- Personnel costs. Average salaries are in the order of 23 US$ per month; a salary covering the minimum living standard would be about 13 times this amount;
- Electricity. This energy cost on average 8.7 Dram = 0.021 US$ per kWh in 1995 and 13.7 Dram = 0.033 US$ per kWh in 1996; this is about half the normal cost price;

- Depreciation. This cost item represented the following average percentages of the acquisition value of the assets:

  - in 1993 0.4%
  - in 1994 5.5% (however of strongly undervalued assets)
  - in 1995 1.3%
  - in 1996 2.0% (the assets being still undervalued).

  Official depreciation rates, which are those of the Russian Federation, are relatively low. For example office buildings have to last 100 years, electric locomotives 30 years (the same as in Germany), rails, ballast and sleepers about 20 years (in Germany, depreciation is variable according to the intensity of use, from 1.4 to 10.1% p.a.). In addition to that, understated depreciations have resulted from the undervaluation of assets and other distorting effects of inflation;

- Maintenance. If the cost categories „materials" and „major repairs" (actual expenses only) are considered as representing the maintenance costs, these costs represented 2.6% in 1993, 78% in 1994 (assets being extremely undervalued), 7.6% in 1995 and about 6% in 1996. These figures become about ¼ higher if the other (fixed) costs of the cost centres called „maintenance units" are also added. Apart for 1994, where there were exceptionally high materials costs at the locomotive centre Yerevan, maintenance costs appear as being relatively too low, particularly if the undervaluation of the assets is considered. The planned costs for „major repairs" (see Annex 1.2-5), might rather reflect what should be done in that respect.

The structure of revenues and costs, in as far as the accounting system is able to show, can be seen in Annex 1.2-4, which gives a statistical overview of the physical and financial performance of Georgian Railways. The table is uncompleted due to the insufficiencies of the received records. It can be stated that passenger transport played a fairly significant role four years ago but has lost its importance since, and also that a strong cross-subsidisation exists in its favour.

Armenian Railways are suffering in a particularly high extent from traffic recession. At present, only about half of the network of 800 km is permanently under operation and Armenia, a landlocked country has only one access by rail to the rest of the world, due to the political problems in the region.

1.2.3.1.3 Present level of investment expenditures

Due to the lack of funds and of local borrowers, investment or reinvestment expenses were insignificant in the last years: they amounted to 196.5 Million Dram (0.68 Million US$) in 1994 and 104 Million Dram (0.26 Million US$) in 1995. A Diesel locomotive was purchased in 1994. Apart from that, most of the money was spent for removing part of the damages of the 1988 earthquake.

1.2.3.2 Cost accounting

1.2.3.2.1 Cost centres in use at present

The main activities of Armenian Railways are comprised in 22 cost centres (see Annex 1.2-5), which however do not serve for cost accounting. Each of these cost centres acts as an own entity with own balance sheets. Apart from the main cost centres (including administration), there exists a group of cost centres called „auxiliary and service activities", which are small power plants, water distribution schemes and regional storage units.

1.2.3.2.2 Functioning of cost accounting

Each cost centre calculates its own costs, revenues, profits and also prepares its own balance sheet, on a monthly and quarterly basis respectively.

The consolidated balance sheets and cost and revenue calculations are then consolidated quarterly by the concerned departments of the headquarters (accounting and economic planning) on the basis of these individual documents, which they receive (amazingly) from the tax administration. The tables represented in Annex 1.2-5 are the result of the consolidation of the cost calculations of all cost centres of the „main activities" sphere of Armenian Railways.

Each of the cost centres also prepares its profit-and-loss statement, but it has virtually no competence in influencing neither its costs nor its income, as both are decided by the head office. This unnormal situation, which existed since Armenian Railways became independent from the former USSR railway administration, is due to totally insufficient revenue.

The only real cost accounting is the one which separates the costs according to whether they belong to goods transport or to passenger traffic. The result of this separation, which is partly based on assumptions and estimates, does not entirely reflect the causality of costs.

1.2.3.2.3 Budgeting, controlling

There exists a budgeting and controlling system, which is coming from Soviet times and which is under the responsibility of the „economic department". However, costs and incomes are mainly determined by the headquarters, often in an improvised way, due to insufficient revenues. Under these circumstances, budgeting and controlling have lost part of their usefulness.

1.2.3.2.4 Critical assessment of the present cost accounting system

The decentralised cost centre accounting, which is typical for the former Soviet Union, enables a certain decentralisation of responsibilities and a decentralised cost control. It is however not able to serve the purpose of analysing and optimising costs by interesting categories and types of services.

The profit calculation for each cost centre, being mainly based on artificial revenues, cannot provide much interesting information about management performance.

The way the system is decentralised makes that duplication of tasks at different levels takes place, with much copying being involved. As computers are not yet being used, the work is labour intensive and cumbersome. All tables and reports are prepared manually.

1.2.3.3 Other relevant information

Due to the consequences of the collapse of the former USSR and of the war with Azerbaijan, the traffic of the Armenian Railway decreased considerably (from 5,140 Million tkm in 1985 to 450.9 Million tkm in 1993 and further to 351 Million tkm in 1996 for goods traffic; from 490 Million pass.km in 1985 to 435 Million pass.km in 1993 and further to 84 Million pass.km in 1996 for passenger traffic).

The goods transport of Armenian Railways is mainly influenced by the activity of major industrial clients, as: mills, mining industries (the gold producing and processing enterprise "Armgold" being the biggest client), producers of special building materials, mechanical and electro-mechanical industries, food processing factories, foundries for special metals. As in other countries of the FSU, these statal or parastatal industries are suffering from being separated from their former supply or sales markets.

Armenian Railways do not participate in the regional clearing agreement for goods transport. International transports from and to Armenia, which at present pass entirely via Tbilisi, are subject to a break at the border stations of Sadakhlo/Ayrum, where new documents have to be issued.

Some performance indicators for 1996 are given below:

Tab. 1.2-1: Performance and cost ratios of Armenian Railways for 1996

tkm equiv.[1] performed in a year[2] per staff member (rounded)	116,000
Annual costs per tkm equiv.	1.80 UScents
Receivables at the end of December, 1996, in % of annual sales	55%
Personnel costs 1996 in % of total annual costs	18.1%
Depreciation costs 1996 in % of the acquisition value of assets	2.0%
Actual expenses for maintenance in % of the acquisition value of assets	about 6 to 8%

1 Tonnes-kilometer equivalent, composed of performed tonnes-kilometers plus passenger-kilometers.

2 Figures available for only 9 months were converted to annual figures by multiplying them with 1.33

1.2.3.4 Price level of railway transport in the three countries

Some actual transport prices applied by the three Caucasian Railways in December 1996 are indicated hereafter (not including handling costs):

Tab. 1.2-2: Some transport prices applied by the Caucasian railways

	Georgian Railways	Azerbaijan Railways	Armenian Railways
Bulk products, domestic transport (in 60t wagon)	9.53 SFr/t = 7.14 US$/t incl. VAT* for 310 km = 0.023 US$/tkm	161.46 US$ incl. 20% VAT* per 60t wagon for 130 km = 0.0207 US$/tkm	13.2 Dram/tkm incl. 20% VAT* = 0.028 US$/tkm
Bulk products, international transport	13.68 SFr/t = 10.25 US$/t for 360 km = 0.028 US$/tkm	617,07 US$ incl. 20% VAT per 60t wagon for 502 km = 0.0205 US$/tkm	13.2 Dram/tkm incl. 20% VAT = 0.028 US$/tkm
Containers of 20ft (loaded), domestic transport	277 SFr = 208 US$ incl. VAT for 316 km = 0.55 US$/km	260.16 US$ incl. 20% VAT for 362 km = 0.72 US$/km	264 Dram/km incl. 20% VAT = 0.56 US$/km
Containers of 20ft (loaded), inter-national transport	337 SFr = 250 US$ for 387 km = 0.54 US$/km	352,03 US$ incl. 20% VAT for 500 km = 0.70 US$/km	264 Dram/km incl. 20% VAT = 0.56 US$/km
Containers of 20ft (loaded), TRACECA pilot train	116.70 US$ Poti to Tbilisi (about 316 km) = 0.37 US$/km	188,84 US$ (no VAT applicable) for 500 km = 0.38 US$/km	
Mineral oil products, domestic transport	10.65 SFr/t = 7.98 US$/t incl. VAT for 346 km = 0.023 US$/tkm	301.00 US$ per 50t wagon for 362 km (no VAT applicable) = 0.0166 US$/tkm	13.2 Dram/tkm incl. 20% VAT* = 0.028 US$/tkm
Mineral oil products, international transport		24-26 US$/t Baku to Batumi (about 1,000 km) = 0.025 US$/tkm	13.2 Dram/tkm incl. 20% VAT* = 0.028 US$/tkm

* VAT = Value added tax

Above tariffs seem rather low, if compared with West European levels and also if compared with what road transport costs (about 2,000 US$ for a 30t truck from Batumi to Baku = about 0.066 US$/tkm = about 1.00 US$/km per 20ft container). It is generally feared that higher tariffs would make lose clients. Other competition factors, such as time, safety and reliability are not so much considered.

Handling in Poti costs in the order of 0.35 US$/t for dry cargo and 0.56 US$/t for oil products. Handling of a 20ft container costs about 200 US$ in Poti. These costs are not excessive and they are the same if the land transport takes place by road or by train.

Basic passenger tariffs were in the range of 0.5 UScents per pass.km in Georgia, 0.4 UScents per pass.km in Azerbaijan (both average January - September 1996) and 0.3 UScents per pass.km in Armenia. These tariffs are being increased (by about 100% in Armenia) and are coming close to what bus transport costs. It must be said that normal maintenance and replacement can surely not be covered by such prices, also not in the case of buses, what is reflected by the poor condition of trains and buses and the corresponding lack of comfort.

1.2.3 Financial analysis of the Azerbaijan Railway

1.2.3.1 Existing financial situation

1.2.3.1.1 Assets and liabilities

The balance sheets of the years 1994, 1995 and 9 months 1996 are given in Annex 1.2-1. The current re-evaluation of the fixed assets has been carried out by applying official coefficients, which shall have compensated the effects of inflation. The book values which have come out of this exercise do not necessarily reflect the actual values, especially not those for the end of 1994 and 1995, which were still strongly undervalued. A breakdown of the acquisition value of the assets existing in the books at the end of 1994, 1995 and 1996 is given in Annex 1.2-2.

Azerbaijan Railways face acute problems of uncollected receivables, which constrain their liquidity. Receivables at the end of September, 1996, totalling 202 Billion Manat = 48 Million US$, represent 71% of the sales of the period of January to September, 1996, which would correspond to about 55% of annual sales. At the end of 1995, this ratio had been 47% and at the end of 1994 only 5%. The balance sheet report for the third quarter, 1996, states that, of the sales revenues in the first 9 months of 1996, of 221.5 Billion Manat, only 61 Billion Manat were actually received. It is the increasing trend of the receivables, with most of them being virtually irrecuperable, which brings the acute liquidity problems. Part of the salaries are delayed by 3 months. The bad debts with which the Railway administration is struggling come from transports for Government and Government owned enterprises. All concerned parties have increasing liquidity problems and are increasingly unable to honor their debts. As for the Railways, they had, at the end of September, 1996, debts to the tax administration of 77.5 Billion Manat = 18.4 Million US$ and debts to suppliers of 79.9 Billion Manat = 18.9 Million US$. Usually the tax administration is very strict on getting its share of the revenue. This time however, it has agreed on compensating the Railway's tax arrears with part of the receivables. This will ease the liquidity problems a little bit.

The Railway administration has two own, but independently operating forwarding agencies, whose figures are not included in the balance sheets and cost calculations discussed here. These agencies do not face bad debts problems, as their customers have to pay in advance.

1.2.3.1.2 Costs and revenues

The conversion of cost and revenue figures to US$ which has been carried out in the annexes does not entirely reflect real terms, as the Manat was undervalued in 1994. So the Dollar figures for 1994 appear as being too low.

According to the profit-and-loss statements annexed to the balance sheets (Annex 1.2-3), receipts for main activities, net of value added tax, amounted to 284.9 Billion

Manat (68.7 million US$) in the first 9 months of 1996, against costs of 188.8 Billion Manat (45.5 Million US$), leaving a profit for main activities of 96.1 Billion Manat (23.2 Million US$) = 33.7% of the receipts, which looks like a very comfortable margin. It has to be mentioned that this profit includes a "consumption fund" (42.8 Billion Manat = 10.3 Million US$), which is in fact a portion of the salaries. The practise of paying the major share (87% for the first 9 months of 1996) of the salaries out of the (taxed) profit had been introduced in order to comply with Government regulations fixing maximum salaries. It has been abolished as from the beginning of 1997.

The cost and revenue figures of the Railway administration for the transport services and related auxiliary services were as follows for 1995 (details see in Annex 1.2-4):

Tab. 1.2-3: Revenues and costs from transport and auxiliary services of Azerbaijan Railways, 1995

	Total	of which goods transport	passenger transport	side and service act.*
		- Billion Manat -		
Revenue	335.3	277.7	8.0	49.6
Costs	170.8	102.7	27.6	40.5
Profit	164.5	175.0	- 19.6	9.1
		- Converted to Million US$ -		
Revenue	75.9	62.9	1.8	11.2
Costs	38.7	23.3	6.2	9.2
Profit	37.2	39.6	- 4.5	2.1

* Not including „other profits" (which are minor receipts at the stations and also earned and paid fines), amounting to -11.5 Billion Manat = - 2.6 Million US$)

The structure of revenues, in as far as the accounting system is able to show, can be seen in Annex 1.2-4, which gives a statistical overview of the physical and financial performance of Azerbaijan Railways. Two statements can be made: that the profit margin seems extremely high (however with more than half of it being actually for salaries); and that there exists a strong cross-subsidisation in favour of passenger transport.

There seems to be a contradiction in the fact that substantial profits appeared, while at the same time the Railways suffered from financial constraints in such an extent that staff had to be reduced. The chief economist explained that these profits were tied up in increasing receivables. A look at Annex 1.2-1 confirms this statement.

Understated cost levels exist for the following items:

- Personnel costs. Average salaries are in the order of 45 US$ per month (of which 39 US$ are paid from the profit); a salary covering the minimum living standard would be about 10 times this amount;
- Electricity. This energy costs the Railways on average 190 Manat = 0.046 US$ per kWh; despite the price increases since December 1994 (when it cost 51 Manat = 0.012 US$ per kWh), this is probably still below the cost price;
- Depreciation. This cost item represented the following average percentages of the acquisition value of the assets:
  - in 1994 1.5% (assets being strongly undervalued)
  - in 1995 3.1% (assets being strongly undervalued)
  - for 1996 depreciation has been kept at its previous level in absolute terms, although the assets were strongly re-evaluated (14.5 times); this manipulation, which is totally contrary to accounting rules, shall help keeping costs down and avoiding a loss; if, instead of calculating with the previous valuation of depreciation (which results in a ratio of only 0.2% of the acquisition value of assets), the depreciation had been re-evaluated at the same rate as the assets, the additional depreciation costs of about 107 Billion Manat (24.7 Million US$) would have converted the official annual profit in a loss.

  Official depreciation rates, which are those of the Russian Federation, are relatively low. For example office buildings have to last 100 years, electric locomotives 30 years (the same as in Germany), rails, ballast and sleepers about 20 years (in Germany, depreciation is variable according to the intensity of use, from 1.4 to 10.1% p.a.). In addition to that, understated depreciations have resulted from the undervaluation of assets and other distorting effects of inflation;
- Maintenance. If the totals of the cost centres called „maintenance" are added together, the resulting sum makes 1.1% of the assets in 1994 and 8.2% in 1995. If the cost category „materials" is also added, the resulting sum makes 1.8% of the assets in 1994 and 16.1% in 1995 (assets in both years being undervalued); these figures are erratic and most probably the „maintenance" centres did not work at full capacity. Cost accounting in that respect is unsatisfactory. From discussions held it can be concluded that, due to financial constraints, maintenance could not be fully performed according to technical standards in the last years and that the increasingly limited funds are reserved for emergency measures.

1.2.3.1.3 Present level of investment expenditures

The following amounts were invested in assets in the last years:

Tab. 1.2-4: Amounts spent for investments, 1994 to 1996

	Million Manat	= Million US$	% of the official residual value of the assets
1994	2,323	1.38	1.4%
1995	23,322	5.84	15.5%
1996	15,753	3.75	0.7%

When judging above figures, it must be kept in mind that in 1994 and 1995, the value of the assets was undervalued (which tends to reduce the percentages), but that the Manat was undervalued in 1994. It can however be seen that investments, which consisted in replacements and rehabilitations, were not entirely neglected.

1.2.3.2 Cost accounting

1.2.3.2.1 Cost centres in use at present

The sphere of the „main activities" of the railways, which is the one being analysed here, is subdivided into the following cost centres (called „enterprises"; see Annex 1.2-5):

Passenger transport
Goods traffic (including containers)
Stations
Traction
Wagons
Permanent ways
Maintenance of buildings
Signalisation and telecommunication
Electrical installation
Regional administrations
Head office and other general services
Side and service activities

There exists the project of making the passenger transport an autonomous profit centre.

Azerbaijan Railways are subdivided into 3 regional divisions. Each of them has its administration and prepares quarterly and annual reports, including balance sheets. Each of them also is also subdivided into the above cost centres (or „enterprises"). The group „side and service activities" is composed of storage shops and of small power stations (selling electricity also to private customers).

1.2.3.2.2 Functioning of cost accounting

Each cost centre calculates its own costs and prepares its own balance sheet, on a monthly and quarterly basis respectively. Each of the regional divisions mentioned in the previous paragraph consolidates the reports of its „enterprises" to regional reports (quarterly balance sheet with profit-and-loss statements). Central accounting then consolidates the regional reports to global ones (of which the last balance sheets and annual cost tables are shown in Annexes 1.2-1, 1.2-3 and 1.2-5). The tanker wagon repair shop is not included in the report of the business sphere „main activities", which is dealt with here, but comes under „industrial activities".

Annex 1.2-5 is the consolidated cost report of all cost centres of the whole „main activities" sphere of Azerbaijan Railways. It shows the way cost centre accounting is being done according to former Soviet accounting rules.

As mentioned above, each cost centre calculates for each month its own costs. As for the revenues, they should normally be determined by performance and performance unit prices. Such calculations are still carried out, unit prices applying for example to „gross tkm" for the locomotives and to „axle.km" for the wagons. However, under the existing underemployment conditions and financial constraints, the revenues of the cost centres consist of allocations decided by the headquarters, which do not have much to do with performance, but which are dictated by acute urgencies. Of course the costs are also not really controlled by the „enterprise", but are limited by the revenues. It is obvious that under such conditions the „profits" appearing in the reports of the „enterprises" do not reflect at all their business success and are of no value for managerial conclusions.

The only real cost accounting is the one which separates the costs according to whether they belong to goods transport or to passenger traffic. As can be seen in Annex 1.2-6, this separation has also artificial elements, which do not reflect the causality of costs. This schedule was probably standardised in the former USSR.

1.2.3.2.3 Budgeting, controlling

There exists a budgeting and controlling system, which is coming from Soviet times and which is under the responsibility of the economic and planning department.

Budgeting is mainly oriented to urgent needs, in the same way as the funds allocation explained in the previous paragraph. There exists also a severe checking

of deviations of the actual costs from the budgeted ones. But, as for the „enterprise's" profit, the cost deviations are not valuable indicators for management performance.

1.2.3.2.4 Critical assessment of the present cost accounting system

The decentralised cost centre accounting, which is typical for the former Soviet Union, enables a certain decentralisation of responsibilities and a decentralised cost control. It is however not able to serve the purpose of analysing and optimising costs by interesting categories and types of services.

The profit calculation for each cost centre, being based on artificial revenues, cannot provide much useful information about management performance.

The way the system is decentralised makes that duplication of tasks at different levels takes place, with much copying being involved. As computers are not yet being used, the work is labour intensive and cumbersome. All tables and reports are prepared manually.

1.2.3.3 Other relevant information

The Azerbaijan Railway's strong dependency from the Council of Ministers seems to limit seriously its scope of decision. This explains partly the high amount of bad debts.

As can be seen from Annex 1.2-4, the performance in physical terms has shown a drop after 1993, as a result of the Chechnia war, which disrupted the important traffic flow to Russia (Northern line). It had already decreased drastically before (from 41,895 Million tkm in 1988 to 7,300 Million tkm in 1993). For goods transport, the 1995 level of performance was 33% of the one of 1993 and only 5.8% of the one of 1988.

Recent statistical data are shown with more details in Annex 1.2-4.

Some performance indicators for 1996 are given below:

Tab. 1.2-5: Performance and cost ratios of Azerbaijan Railways for 1996

tkm equiv.[1] performed in a year[2] per staff member (rounded)	202,000
Annual costs per tkm equiv.	1.48 UScents
Receivables at the end of September, 1996, in % of annual sales	55%
Personnel costs 9 months 1996 in % of total costs of the same period	21.2%
Depreciation costs 1996 in % of the acquisition value of assets	0.2%*

* Percentage kept so low due to the fact that assets were re-evaluated, but not the depreciations; this percentage was 3.1% at the end of 1995.

The extremely low „cost price" of 1.48 UScents per tkm equivalent is striking. It reflects the fear of losing business to road transport.

1 Tonnes-kilometer equivalent, composed of performed tonnes-kilometers plus passenger-kilometers.

2 Figures available for only 9 months were converted to annual figures by multiplying them with 1.33

1.2.3.4 Price level of railway transport in the three countries

Some actual transport prices applied by the three Caucasian railways in December 1996 are indicated hereafter (not including handling costs):

Tab. 1.2-6: Some transport prices applied by the Caucasian railways

	Georgian Railways	Azerbaijan Railways	Armenian Railways
Bulk products, domestic transport (in 60t wagon)	9.53 SFr/t = 7.14 US$/t incl. VAT* for 310 km = 0.023 US$/tkm	161.46 US$ incl. 20% VAT* per 60t wagon for 130 km = 0.0207 US$/tkm	13.2 Dram/tkm incl. 20% VAT* = 0.028 US$/tkm
Bulk products, international transport	13.68 SFr/t = 10.25 US$/t for 360 km = 0.028 US$/tkm	617,07 US$ incl. 20% VAT per 60t wagon for 502 km = 0.0205 US$/tkm	13.2 Dram/tkm incl. 20% VAT = 0.028 US$/tkm
Containers of 20ft (loaded), domestic transport	277 SFr = 208 US$ incl. VAT for 316 km = 0.55 US$/km	260.16 US$ incl. 20% VAT for 362 km = 0.72 US$/km	264 Dram/km incl. 20% VAT = 0.56 US$/km
Containers of 20ft (loaded), inter-national transport	337 SFr = 250 US$ for 387 km = 0.54 US$/km	352,03 US$ incl. 20% VAT for 500 km = 0.70 US$/km	264 Dram/km incl. 20% VAT = 0.56 US$/km
Containers of 20ft (loaded), TRACECA pilot train	116.70 US$ Poti to Tbilisi (about 316 km) = 0.37 US$/km	188,84 US$ (no VAT applicable) for 500 km = 0.38 US$/km	
Mineral oil products, domestic transport	10.65 SFr/t = 7.98 US$/t incl. VAT for 346 km = 0.023 US$/tkm	301.00 US$ per 50t wagon for 362 km (no VAT applicable) = 0.0166 US$/tkm	13.2 Dram/tkm incl. 20% VAT* = 0.028 US$/tkm
Mineral oil products, international transport		24-26 US$/t Baku to Batumi (about 1,000 km) = 0.025 US$/tkm	13.2 Dram/tkm incl. 20% VAT* = 0.028 US$/tkm

* VAT = Value added tax

Above tariffs seem rather low, if compared with West European levels and also if compared with what road transport costs (about 2,000 US$ for a 30t truck from Batumi to Baku = about 0.066 US$/tkm = about 1.00 US$/km per 20ft container). It is generally feared that higher tariffs would make lose clients. Other competition factors, such as time, safety and reliability are not so much considered.

Handling in Poti costs in the order of 0.35 US$/t for dry cargo and 0.56 US$/t for oil products. Handling of a 20ft container costs about 200 US$ in Poti. These costs are not excessive and they are the same if the land transport takes place by road or by train.

Basic passenger tariffs were in the range of 0.5 USCents per pass.km in Georgia, 0.4 USCents per pass.km in Azerbaijan (both average January - September 1996) and 0.3 USCents per pass.km in Armenia. These tariffs are being increased (by about 100% in Armenia) and are coming close to what bus transport costs. It must be said that normal maintenance and replacement can surely not be covered by such prices, also not in the case of buses, what is reflected by the poor condition of trains and buses and the corresponding lack of comfort.

1.2.3 Financial analysis of the Georgian Railway

1.2.3.1 Existing financial situation

1.2.3.1.1 Assets and liabilities

The balance sheets of the years 1993, 1994, 1995 and 9 months 1996 are given in Annex 1.2-1. The current re-evaluation of the fixed assets took place by applying official coefficients, which shall have compensated the effects of inflation. The book values which have come out of this exercise do not necessarily reflect the actual values, especially not those for the end of 1993 and 1994, which are strongly undervalued. A breakdown of the acquisition value of the assets existing in the books at the end of 1995 is given in Annex 1.2-2.

At the end of 1995, receivables amounted to 61% of annual sales. This ratio went down to 53% at the end of September, 1996.

1.2.3.1.2 Costs and revenues

According to the profit and loss statements annexed to the balance sheets (Annex 1.2-3), receipts for main activities, net of value added tax, amounted to 58.6 Million Lari in 1995, against costs of 42.0 Million Lari, leaving a profit for main activities of 16.7 Million Lari. The corresponding figures for the first 9 months are: receipts 39.8 Million Lari, costs 40.0 Million Lari, loss 0.2 Million Lari. Following a common practise in Russian type cost accounting, costs subject to internal transactions are counted double: once in the originating cost centres (whose outputs are counted as sales) and then again in the receiving cost centres (where the said outputs are counted as costs). This is the case for part of the costs of the group of cost centres called „side and service activities". Total costs and sales are therefore inflated.

In the case of the profit and loss statements of Georgian Railways, this inflation can be eliminated by excluding the cost centre „side and service activities". The revenues and costs for 1995 were then (for details see Annexes 1.2-4 and 1.2-5):

Tab. 1.2-7: Revenues and costs from transport and auxiliary services of Georgian Railways, 1995

	Total	of which goods transport	passenger transport
	-	Million Lari	-
Revenue	46.7	46.1	0.6
Costs	32.6	20.2	12.4
Profit	14.1	25.9	- 11.8
	-	Converted to Million US$	-
Revenue	36.4	35.9	0.5
Costs	25.4	15.7	9.7
Profit	11.0	20.2	- 9.2

In above figures, „expenses and receipts not related to transport services", which are subject to the second part of the tables in Annex 1.2-3 (and which consist in fact of a property tax of 1% of the fixed assets, of fines paid and received and of rents received) are excluded. The figures also do not include costs and receipts of commercial and production activities of subsidiaries of the Railway administration which are not included in the consolidated balance sheets.

Clearly understated cost levels exist for the following items:

- Personnel costs. Average salaries are in the order of 30 US$ per month; a salary covering the minimum living standard would be about 5 times this amount;
- Electricity. This energy has cost on average 0.045 Lari = 0.036 US$ per kWh since October, 1995; this is about half the normal cost price;
- Depreciation. This cost item represented the following average percentages of the acquisition value of the assets:
  - in 1993 19.5% (figure distorted by inflation)
  - in 1994 4.5% (however of strongly undervalued assets)
  - in 1995 0.8%
  - in 1996 2.4% .

  Official depreciation rates, which are those of the Russian Federation, are relatively low. For example office buildings have to last 100 years, electric locomotives 30 years (the same as in Germany), rails, ballast and sleepers about 20 years (in Germany, depreciation is variable according to the intensity of use, from 1.4 to 10.1% p.a.). In addition to that, understated depreciations have resulted from the undervaluation of assets and other distorting effects of inflation;

- Maintenance. If the cost category „repairs" is considered as representing the maintenance costs, these costs represented 15% of total fixed assets in 1994 (figure distorted by inflation), 3.0% in 1995 and 4.5% in 1996. If the cost category „materials" is also included in the maintenance costs, these figures come to 23%, 4.9% and 8.2% respectively. However this involves double counting and the true maintenance costs are probably between the two ranges of percentages. Considering that buildings, which require low maintenance rates, have only a share of 12% of total assets (see assets structure in Annex 1.2-2), it appears that maintenance costs are relatively too low, which discloses an insufficient maintenance level. These costs should be at least 50% higher if real maintenance shall take place.

The structure of revenues, in as far as the accounting system is able to show, can be seen in Annex 1.2-4, which gives a statistical overview of the physical and financial performance of Georgian Railways. It can be stated that passenger transport is not negligible and that a strong cross-subsidisation exists in its favour.

There seems to be a contradiction in the fact that substantial profits appeared in the profit-and-loss statements of previous years while at the same time the Railways suffered from financial constraints in such an extent that staff had to be reduced. The chief economist explained that these profits were tied up in increasing receivables. A look at Annex 1.2-1 confirms this statement.

1.2.3.1.3 Present level of investment expenditures

Due to the lack of own funds and to the absence of local borrowers, virtually no investment has been undertaken during the last three years.

1.2.3.2 Cost accounting and related fields

1.2.3.2.1 Cost centres in use at present

The sphere of the „main activities" of the railways, which is the one being analysed here, is subdivided into the following cost centres (called „enterprises"; see Annex 1.2-5):

Passenger transport
Goods traffic (including containers)
Stations
Traction
Wagons
Permanent ways
Buildings
Signalisation and telecommunication
Electrical installation
Regional administrations
Head office and other general services
Side and service activities

Up to the end of 1996, Georgian Railways were subdivided into two regional divisions, the one of Tbilisi and the one of Samtredia. Each of these two divisions had its administration and prepared quarterly and annual reports, including balance sheets. Each of them also was subdivided into the above cost centres (or „enterprises"). The group „side and service activities" is composed of several repair and storage shops and also of power stations.

As from the beginning of 1997, the regional divisions have been abolished, in the frame of a general administrative simplification and cost saving action.

1.2.3.2.2 Functioning of cost accounting

Each cost centre calculates its own costs, revenues, profits and also prepares its own balance sheet, on a monthly and quarterly basis respectively.

Up to the end of 1996, each of the two regional divisions mentioned in the previous paragraph consolidated the reports of their „enterprises" to regional reports (cost table, quarterly balance sheet and profit-and-loss statement). Central accounting then consolidated the regional reports to global ones (Annexes 1.2-1, 1.2-3 and 1.2-5). Wagon plants, the locomotive factory and other „industrial activities" remain outside of the reports of the business sphere „main activities", which is the one being dealt with here.

As from January, 1997, the consolidation of reports is done in one stage only, as the regional divisions have been dissolved.

Annex 1.2-5 is the consolidated cost report of all cost centres of the whole „main activities" sphere of Georgian Railways. It shows the way cost centre accounting is being done according to former Soviet accounting rules. It is also typical for that system that, if internal transactions take place, the corresponding costs (and revenues) are counted double, as explained in the previous paragraph.

As mentioned above, each cost centre calculates for each month its own costs, revenues and profits. For getting the revenues, either performance related unit prices serve as basis, or just lump sums. Unit prices are used for the traction performance of the locomotive centre (the unit being the „gross tkm", differentiated by transport category and tracting power); for the shunting performance of the shunting stations centre (the unit being the working hour); for the wagon centre (the unit being the „technical inspection", which is in fact the act of putting a wagon into operation). Concerning the performance of the locomotives, it has also to be mentioned that this performance was in the past broken down by regions, so that each of the two former regional entities got its share of the revenue.

The unit prices (or lump sums) on which the monthly revenues are based are calculated in advance by each cost centre. They have to be approved by the head office.

The only real cost accounting is the one which separates the costs according to whether they belong to goods transport or to passenger traffic. As can be seen in Annex 1.2-6, this separation has also artificial elements, which do not reflect the causality of costs. This schedule was probably standardised in the former USSR.

1.2.3.2.3 Budgeting, controlling

There exists a budgeting and controlling system, which is coming from Soviet times and which is under the responsibility of the „economic department".

Each cost centre (or „enterprise") prepares its own cost planning, which is based on standard costs, which were calculated by the cost centre and approved by the economic department. A comparison of the actual costs with the planned ones is carried out by the cost centres for each quarter. Deviations are then analysed by the economic department and corrections of the norms are made when necessary.

It has to be stated that budgeting and cost control do take place. Strict cost limitation comes however less from cost control than from the scarcity of funds available, which are such that the quality of services tends to decrease.

1.2.3.2.4 Critical assessment of the present cost accounting system

The decentralised cost centre accounting, which is typical for the former Soviet Union, enables a certain decentralisation of responsibilities and a decentralised cost control. It is however not able to serve the purpose of analysing and optimising costs by interesting categories and types of services.

The profit calculation for each cost centre, being mainly based on artificial revenues, cannot provide much useful information about management performance.

The way the system is decentralised makes that duplication of tasks at different levels takes place, with much copying being involved. As computers are not yet being used, the work is labour intensive and cumbersome. All tables and reports are prepared manually.

1.2.3.3 Other relevant information

As for the two other Caucasian railways, the performance of Georgian Railways has dropped dramatically since Soviet times: goods transport fell from 12,591 Million tkm in 1988 to 955.3 Million tkm in 1994.

For the recent past, the following figures suggest that, since 1994, the activity of the Railways is recovering slowly, along with the recovery of economy[1]:

Tab. 1.2-8: Transport performance of Georgian Railways, 1993 - 1996

	Total performance in goods transport, 10^3 tkm	Total performance in passenger transport, 10^3 passenger.km
1993	1,553,554	1,004,935
1994	955,291	1,164,502
1995	1,245,981	371,316
1996	1,141,381	380,261

Recent statistical data are shown with more details in Annex 1.2-4.

Some performance indicators for 1996 are given below:

Tab. 1.2-9: Performance and cost ratios of Georgian Railways for 1996

tkm equiv.[2] performed in a year[3] per staff member (rounded)	83,000
Annual costs per tkm equiv.	2.27 UScents
Receivables at the end of September, 1996, in % of annual sales	53%
Personnel costs 9 months 1996 in % of total costs of the same period	25.9%
Depreciation costs 1996 in % of the acquisition value of assets	1.8%
Costs for („repair fund") in % of the acquisition value of assets	4.5%

1 According to „Georgian Economic Trends", 3rd quarter 1996 (a TACIS financed publication), real GDP had declined sharply between 1991 and 1994 and has then shown an increase from 1994 to 1995 of 2.4%, to which succeeded a faster growth from 1995 to 1996 (14.3% for the first 9 months of 1996 against the same period of 1995).

2 Tonnes-kilometer equivalent, composed of performed tonnes-kilometers plus passenger-kilometers.

3 Figures available for only 9 months were converted to annual figures by multiplying them with 1.33

1.2.3.4 Price level of railway transport in the three countries

Some actual transport prices applied by the three Caucasian railways in December 1996 are indicated hereafter (not including handling costs):

Tab. 1.2-10: Some transport prices applied by the Caucasian railways

	Georgian Railways	Azerbaijan Railways	Armenian Railways
Bulk products, domestic transport (in 60t wagon)	9.53 SFr/t = 7.14 US$/t incl. VAT* for 310 km = 0.023 US$/tkm	161.46 US$ incl. 20% VAT* per 60t wagon for 130 km = 0.0207 US$/tkm	13.2 Dram/tkm incl. 20% VAT* = 0.028 US$/tkm
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Containers of 20ft (loaded), domestic transport	277 SFr = 208 US$ incl. VAT for 316 km = 0.55 US$/km	260.16 US$ incl. 20% VAT for 362 km = 0.72 US$/km	264 Dram/km incl. 20% VAT = 0.56 US$/km
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Containers of 20ft (loaded), TRACECA pilot train	116.70 US$ Poti to Tbilisi (about 316 km) = 0.37 US$/km	188,84 US$ (no VAT applicable) for 500 km = 0.38 US$/km	
Mineral oil products, domestic transport	10.65 SFr/t = 7.98 US$/t incl. VAT for 346 km = 0.023 US$/tkm	301.00 US$ per 50t wagon for 362 km (no VAT applicable) = 0.0166 US$/tkm	13.2 Dram/tkm incl. 20% VAT* = 0.028 US$/tkm
Mineral oil products, international transport		24-26 US$/t Baku to Batumi (about 1,000 km) = 0.025 US$/tkm	13.2 Dram/tkm incl. 20% VAT* = 0.028 US$/tkm

Above tariffs seem rather low, if compared with West European levels and also if compared with what road transport costs (about 2,000 US$ for a 30t truck from Batumi to Baku = about 0.066 US$/tkm = about 1.00 US$/km per 20ft container). It is generally feared that higher tariffs would make lose clients. Other competition factors, such as time, safety and reliability are not so much considered.

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Basic passenger tariffs were in the range of 0.5 USCents per pass.km in Georgia, 0.4 USCents per pass.km in Azerbaijan (both average January - September 1996) and 0.3 USCents per pass.km in Armenia. These tariffs are being increased (by about 100% in Armenia) and are coming close to what bus transport costs. It must be said that normal maintenance and replacement can surely not be covered by such prices, also not in the case of buses, what is reflected by the poor condition of trains and buses and the corresponding lack of comfort.

1.2.4 Deficiency analysis and rehabilitation plan

1.2.4.1 Working plan

WP 1240 is under preparation. Essential inputs are required from the technical experts working on WS 1100, especially the investment amounts necessary for compensating the re-investment and maintenance backlog in infrastructure (permanent ways, signalling and telecommunication, power supply and stations). The same applies to the rolling stock.

The investment plan is at present being finalised, in accordance with the revised traffic forecast. It does not include the secondary lines, which is however not a major obstacle for its integration in the financing schedule.

The necessary steps for preparing financing schedules and financing proposals as requested by the terms of reference are:

(a) Assumption of a reasonable price policy of the railways. Underpricing is at present applied for some market segments; this is particularly visible for passenger transport, which is heavily subsidised by the goods transport, what exhausts the already precarious financial situation of the railways. Such assumption regarding future tariffs will anticipate the findings of the other parts of the study relevant for this subject (WP 3140, 3220, and 3260).

(b) Projecting the costs and revenues of the three railway administrations, starting from the present situation as stated under WP 1220. This projection will have to be carried out by components relevant for the envisaged formation of separate entities, such as for example permanent ways and signalling & communication. It will correspond with the traffic forecast (WP 2120 and 2130), which has just been finalised, while being adaptable to any adjustments of it.

(c) Introducing the cost elements (particularly maintenance and depreciation) related to future investments according to the above mentioned investment plan.

(d) Once the project components envisaged for external financing have been identified and corresponding financing schedules have been worked out (point b above), possible sources of finance will be investigated and proposed.

WP 1240 has to deal only with the infrastructure, however preparatory work for the financial proposals and calculations in the 3000 package will be carried out at that stage, as the starting point is the situation of the railways in their totality.

1.2.4.2 Cost and revenue model for the three railways

Step b has already been partially completed in the form of a model in which alternative assumptions regarding prices and the elements of the investment plan can be introduced. The summary table of the model is given in annex 1.2-7; the specific calculations for each railway administration are not shown by reasons of

confidential treatment. This model corresponds with the one of the rehabilitation study for the Azerbaijan and Georgian railways, except in the case of diverging assumptions.

The model is of course provisional and at this stage, calculations have been carried out at unchanged tariffs. Underestimated costs as stated in paragraph 1.2.3 have been changed into more realistic ones. This is also valid for personnel costs, which will certainly increase as economy recovers.

The provisional calculation shows that the Caucasian railway system is only viable at a level of activity which is a multiple of the present one (about 5 times). Azerbaijan Railways must undertake serious efforts to increase its payment rate (payments/sales).

The model will enable to calculate the unit cost price for the use of the infrastructure and thus to propose a tariff in that respect. It will then be possible to prepare a separate cashflow for infrastructure as a whole, and also for parts of it.

1.3 Establishment of international cooperation

When defining the main aims of co-operation one has to take into account that Transcaucasian and Azerbaijan Railways, in existence for about 120 years, have developed as a part of the Russian railway system. In Soviet times, the Ministry of Railways (MPS) was in charge of the planning, and the regulations and directives of the former Soviet Railways are still binding for all three Railway Administrations. The Directives applicable to superstructure, bridges, signalling, telecommunication, train operation, goods traffic, passenger transport, locomotives, cars a.s.o. for instance are being translated into the respective national languages, at present, but its contents remains unchanged. All three Railway Administrations are members of the Council of Railways of the CIS, among whose main tasks the adoption of standardisation documents is defined.

Furthermore, Azerbaijan Railways and Georgian Railways are members of the OSShD, and all three countries are members of the UIC, thus the instruction sheets of these Railway Associations are applicable to these Railways. Since, with a few exceptions, co-operation in the technical committees of UIC and of the commission of OSShD does not exist, this function is fulfilled by the Russian Railway Administration. The co-ordination of points of view within the CIS railway systems is done by expert groups of the Council of Railways of the CIS.

The aims of a co-operation in the development of the infrastructure have to take into account the above mentioned conditions. In particular the introduction of new technologies and techniques for best possible results calls for co-ordination between the Railways of the TRACECA corridor. Co-ordination is of prime importance in the following fields:

- Elaboration of mutually agreed investment strategies for the main lines of international traffic, in accordance with the experience gained with European corridors (e.g. Paris-Berlin-Warsaw-Minsk-Moscow). It is suggested to create joint working parties which bindingly agree upon both technical aims (maximum speeds, signalling systems, communication, and others) and investment plans and which, if so needed, prepare specifications for the development of the corridor, to serve as a basis for invitations to tender. The chronological order of these works must be bindingly agreed upon. The corresponding invitations to tender are the responsibility of the Railway Administrations.
- For select, non-corridor-related complexes of tasks temporary working parties ('ad hoc groups') could be created which elaborate outline specifications. Here, one should first concentrate on the following aims:
  - development of the communication network;
  - co-ordination as regards new types of superstructure, especially with a view to types of sleepers and rail fastenings;
  - radio-aided train protection systems;
  - computer networks for international transport tasks;

- further development of catenary system;
- electronic data interchange.

This ad hoc group should also elaborate proposals for the Council of Railways of the CIS, in pursuance of sub-paragraph 10 of the Directive (local agreements).

- It is suggested to establish a joint secretariat with Azerbaijan State Railways to co-ordinate the development of the technique to be used in the TRACECA corridor, the order of the investments to be necessary, and the assessment of the required equipment and materials, which will serve as a basis for assessing the production volume of the Joint Ventures to be created.
- Selection of partial strategies for the foundation of joint ventures, to be done by controlling committees composed of experts from the various fields, and of transport-offering and decision-making bodies of the respective countries.

  The controlling committees' work is aimed at preparing, monitoring, and enforcing the strategies regarding the foundation of joint ventures.

2 Traffic Forecast

2.1 Freight Traffic Forecast

2.1.0 Introduction

A forecast on the development of the Azerbaijan and Georgian railways' freight traffic has already been drawn up by the Consultant within the scope of the TRACECA - project 'Pre-investment study and pilot train Baku - Tbilisi - Batumi/Poti'. The following material draws on those results. The investigations on the oil production and processing sector have been further deepened and detailed, as this sector is of special importance for the development of the transport volume in the rail traffic of the Caucasus region.

A repeated detailed depiction of the investigation results for Azerbaijan and Georgia is not included in this report. This applies especially to the analysis of the macroeconomic situation, the development of foreign trade and the current situation in rail freight traffic of these countries. However, there follows a more detailed depiction of the oil production and processing area.

The investigations on the traffic forecast within the project 'Joint venture(s) for the Caucasian Railways' focused on:

- forecast on the development of the Armenian Railways' freight traffic
- forecast on the freight volume in important transport corridors of all three countries
- development of transport volumes for selected main types of goods
- deepening investigations on the development of competing modes of transport and transport corridors
- forecast on the development of passenger traffic of the three railways altogether and on the main lines

The already difficult task of predicting traffic development under the currently extremely complicated political and economic conditions was rendered even more difficult by the fragmentary statistical starting data provided. The data made available on rail traffic in concrete transport relations was especially weak. There is scarcely reliable data on road traffic in the three countries. Data provided usually comprises only the state sector, whose significance is dwindling more and more. Statistical material made available is not always reliable. And it varies greatly from country to country as to scope and structure.

The circumstances just described with regard to statistical details led to the situation that a great number of different sources (e.g. customs, foreign trade authorities, ports, selected transport companies, forwarders) had to be utilised. In many cases, the existing statistical data had to be supplemented or specified by own assumptions and calculations.

There was close coordination and data exchange with other running relevant TRACECA projects, especially with:

- Regional traffic forecasting model
- Forwarding / Multimodal transport system
- Rolling stock maintenance
- Technical assistance for the development of the Port of Baku
- Port network plan and improvement programme

Furthermore, the results of projects already concluded were also considered.

2.1.1 Methodology

Traditional mathematical and statistical methods of traffic forecasts, normally used under West European conditions, do not apply to the prognosis of traffic flows under the current situation in East European countries. These methods would lead to very imprecise results, under the conditions prevailing in the successor states to the former Soviet Union, at the moment.

Due to the reasons mentioned, a methodology was applied in drawing up the traffic volume forecast, tailor-made for the conditions of the East European reform states.

This special methodology of the Consultant includes the following main elements:

The most important initial item to be analysed for assessing the future traffic volume is the development of the main economic indices, especially the Gross Domestic Product (GDP). The assumption is that there is a close connection between the development of the GDP and the total traffic volume of a country, which has been extensively proved by analogue investigations in various East European countries and for different periods of time.

The development of selected branches of the economy, which are of special importance for the traffic volume of the railways, have been assessed in detail to further verify the forecast.
These are above all the oil processing industry, the chemical industry, the non-ferrous and ferrous metallurgy, the building materials industry as well as agriculture, for the respective period of investigation.

The foreign trade relations are of special significance for the development of the freight traffic volume. That is why very detailed investigations were conducted on the current and the future structures and trade volumes. The studies also included the foreign trade relations of other countries, which are of interest especially for the transit traffic of the region, e.g. the Central Asian republics, Russia, Turkey, Iran.

The possible development of the mentioned factors is depicted in two scenarios, an optimistic and a pessimistic one.

Percentage rates were deducted for the development of the transport volume in the mentioned railway traffic for the period up to 2015, divided according to domestic traffic, export, import, transit and that in the respective two scenarios. The statistical data for 1995 served as reference figures. Separate assumptions on the production and trade volume were made for individual types of goods, which are of particular importance for the total traffic volume. These assumptions are described in the following. This applies especially to the oil processing sector.

The traffic volume for important transport corridors was established on the basis of these statements on the development of the total traffic. In doing so, the pertaining development rates for the individual segments (export, import, transit, domestic traffic) were used, and where necessary, they were harmonised with the data of neighbouring railways. The establishment of a reliable starting level posed a problem for those transport corridors along which there is no or a very limited freight traffic due to the political tensions in the region. The respective approach chosen is explained in detail in the relevant section.

2.1.2 Development of GDP

The assessment of the possible development of the Gross Domestic Product, as one of the most important economic indices, was conducted with the help of an analysis of the economic and political situation, based on selected important factors such as

- political stability,
- climate for investment,
- situation of the national economy,
- stability of the money value / availability of foreign currency,
- foreign trade as well as
- the stage of the reform process.

Furthermore, similar investigations conducted by the World Bank, the IMF and the World Food Program were included in the assessment.

As the calculation of the GDP is conducted very differently in the individual countries, and especially the statistical reference figures available in the three countries are relatively unreliable at present, this investigation was carried out without using absolute figures for the GDP. The assessment was drawn up on the basis of the annual percentage of change, using the year 1989 as the year of reference.

The width and breadth of a possible development is depicted in an optimistic and a pessimistic scenario, separately for each country.

Despite all care taken in the analysis of the economic situation, a forecast of the socio-economic development of the Caucasus republics is connected with a great amount of insecurity, due to the unstable political situation of the region.

2.1.2.1 Political Situation

Armenia

After the disintegration of the former Soviet Union, the Republic of Armenia declared its independence in 1991. A new constitution was adopted in 1995. Armenia has had the most stable domestic political development of the three Caucasus republics. Up until now, the country has been spared civil-war type of strife, ethnic conflicts or separatist movements.

The relatively stable domestic conditions, which developed subsequently to reaching independence, have contributed to the fact that the course of reforms adopted by the government has already led to considerable success on the path towards a market economy, as compared to the other republics of the former Soviet Union.

The economic situation of the country is put under a particularly severe strain because of the conflict of Nagorno-Karabakh. As Armenia is more or less at war with Azerbaijan, all important transport routes from and to Azerbaijan are blocked. This is especially difficult, as in the past nearly 80 per cent of all transports from and to Armenia were conducted in transit via Azerbaijan. The conflict of Nagorno-Karabakh has also strained relations with Turkey considerably. There are no transport links with this neighbouring country either.

There are relatively close political ties with Russia and Iran, at the moment. Apart from that, Armenia maintains very close and good relations with Western Europe and the USA.

Azerbaijan

Stable domestic political conditions continue to prevail in Azerbaijan. The process of democratisation is progressing further.

The economic situation of the country is still severely strained by the conflict surrounding Nagorno-Karabakh. The railway connection to Nakhichevan is severed, whereby this part of Azerbaijan is hardly accessible by road (only via Iran). Traditional transport ways from and to Russia are also barely usable due to the conflict in Chechnya at the moment.

Just as Armenia, the further economic development over the years to come will be determined above all by the political situation in the region

Georgia

After a great number of ethnic, religious and nationalist conflicts had led to military and in part civil-war-like disputes at the beginning of the 90s, the domestic political situation of the country is relatively stable now.

The conflict of Abkhasia striving for autonomy has not been solved yet, and there are further hotbeds of tension in Adsharia and South Ossetia.

2.1.2.2 Makroeconomic Development

Armenia

Among the former Soviet republics Armenia experienced the most extreme drop in the Gross Domestic Product at the beginning of the process of reforms. From 1989 to 1993, the GDP dropped by more than 60 %.

On the other hand, Armenia is the only country among the former Soviet republics which has featured positive growth rates of the Gross Domestic Product as of 1994. There was a GDP growth rate of more than 6 per cent in 1995. This development is mainly due to the speedy progress in the process of transition to market economy structures. The reform process was initiated relatively early and determinedly, above all thanks to the stable domestic situation. Starting in 1991, the reform process covered practically all spheres of the national economy. Further positive effects are to be expected mainly from a comprehensive programme of macroeconomic stabilisation and structural reforms, which was drawn up by the government in 1995, in cooperation with renown international financial institutions.
The gradual economic growth is accompanied by a further drop in the rate of inflation as well as the budget deficit.

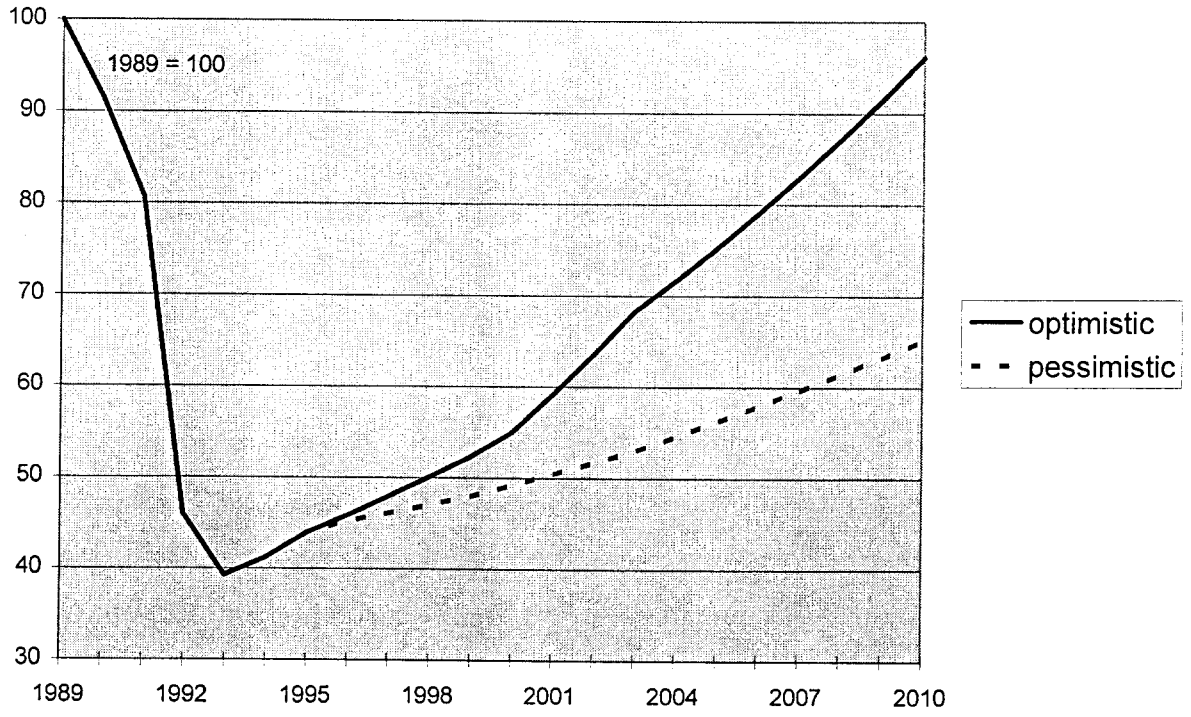
The following framework conditions formed the basis for the assessment of the future development of the GDP:

Optimistic scenario	Pessimistic scenario
Political situation:	
❒ the domestic situation in Armenia will remain stable also in future, the democratic conditions will be further strengthened in the country	❒ growing social problems will put a strain on the internal stability
❒ by the year 2000, a stage will have been reached in the conflict of Nagorno-Karabakh which will allow the opening of important transit corridors through Azerbaijan (Nakhichevan/Dshulfa), the relations with Turkey will also have normalised at this point in time	❒ the problem of Nagorno-Karabakh will be solved by the year 2005 at the earliest, thus the transit transports through Azerbaijan will not be possible in the year 2000 yet, first progress in the relations with Turkey will enable transports of a limited extent between the two countries
Development of the national economy:	
❒ industrial production of the country will show moderate growth rates in the key areas over the coming years	❒ the growth rate of industrial production will only develop hesitantly, minor increases will be registered only in a few areas
❒ the situation in the energy supply of the country will be further stabilised, there will be no restrictions of production because of energy problems	❒ the energy supply will remain difficult especially due to problems in the import of fuel
❒ due to the relatively favourable investment conditions and stable political relations, the inflow of foreign capital will increase	❒ domestic tension will be the cause for a hesitant attitude of foreign investors
❒ based on existing traditions and well trained experts, a high-quality processing industry will develop, especially in the areas of mechanical engineering and lighter manufacturing	❒ due to sustained economic difficulties, local qualified specialists will go abroad to a growing extent, which will hamper the expansion of the domestic processing industry
❒ the existing high-quality raw materials will be processed in the country to a large extent and the revenue will contribute to heightening the investment power of the country	❒ domestic raw materials will be exported at an early stage of processing and this to an unfavourably large extent, which will reduce the revenue on the one hand and the impulses for developing the own processing industry, on the other hand
❒ an efficient services sector will develop with above-average rates of growth, which will gain significance for the entire Caucasus region with progressing normalisation of the political situation	❒ as it will not be possible to solve the political problems in the short term, there will not be a sufficiently receptive market for a developed services sector
❒ the positive development of industrial and agricultural production will lead to a respective growth in the exports of the country, the political normalisation within the region will improve the foreign trade conditions of the country considerably	❒ the major trade routes will remain blocked beyond the year 2000, thus exports will develop only insufficiently, the negative trade balance will remain for the years to come

Policy of reform	
❒ the adopted course of reforms towards market economy structures will be continued consistently	❒ due to domestic difficulties, the government will be forced to take back certain parts of their reform policy
❒ the process of restructuring the economy will show the first successes in the short term	❒ the restructuring process of the economy will prove to be long-winded
❒ the privatisation, especially of medium-sized and large state companies, will be conducted according to schedule	

Based on the framework conditions outlined above, the following scenarios are imaginable for the development of the Gross Domestic Product of Armenia:

Fig. 2.1-1: Development of the GDP in Armenia



- ❒ The trough of the economic development was reached by 1993, at a level of about 40 % as compared to 1989;
- ❒ the starting level of 1989 will not be reached before the year 2010;
- ❒ political détente in the region will lead to increasing growth rates especially as of the year 2000

Azerbaijan

A decline in the GDP of Azerbaijan started at the beginning of the 90s. This reached its worst in the period of 1992 to 1994. By 1996, the GDP had dropped to approximately 30 per cent of its 1989 level. The economic deterioration seems to have stopped in 1996, as of 1997 a slow start of growth may be expected. The further economic development of Azerbaijan will be determined decisively by the oil sector in future.

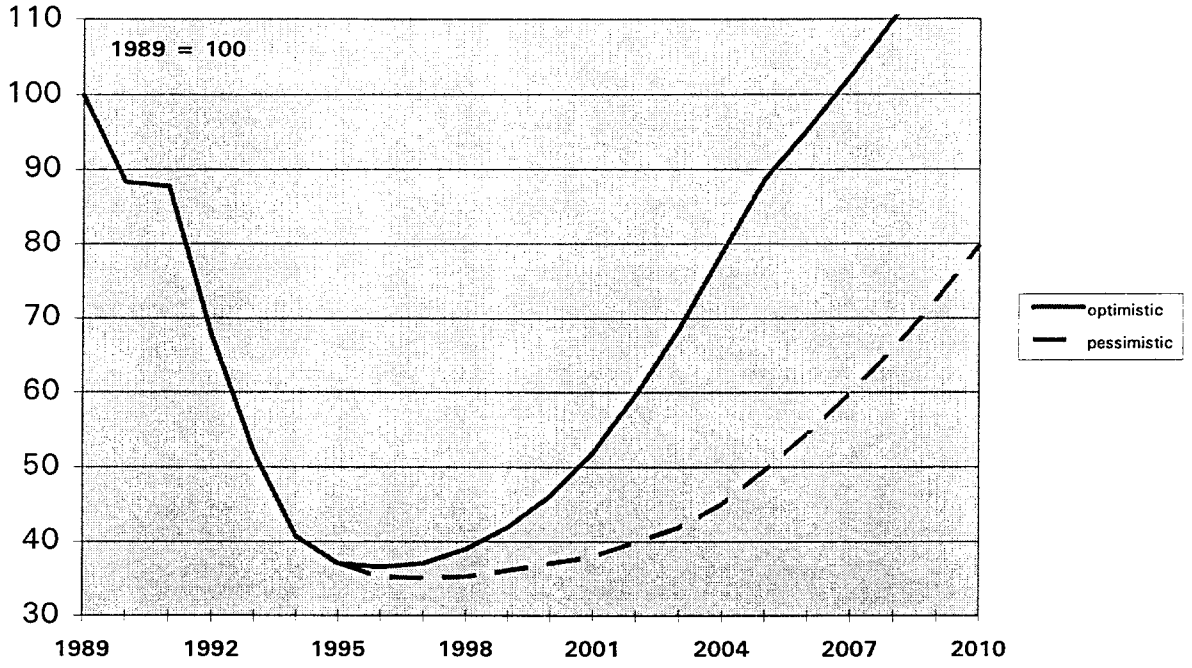
The following scenario formed the basis for predicting the GDP development:

Optimistic scenario	Pessimistic scenario
Political situation:	
❒ stable domestic political conditions	❒ growing social problems will put a strain on the internal stability
❒ the conflict of Nagorno-Karabakh will have been settled peacefully by the year 2000, and there will be no further strains on the economic development anymore	❒ the problem of Nagorno-Karabakh will be solved by the year 2005 at the earliest, so that important transit corridors will still not be available until that point in time
❒	
Development of the national economy:	
❒ AIOC will start oil production as scheduled in 1997; production will be extended to 35 million t/a up to 2010	❒ due to a great number of problems, production of the 'early oil' by AIOC will not start in 1997, production volumes will remain well below the originally planned figures until the year 2000
❒ the development of the oil industry will lead to an upswing of the other branches of economy, especially the processing industry	❒ other branches of industry will lag behind the growth rates of the oil sector considerably; foreign investments will concentrate on oil production;
❒ favourable framework conditions and the development of the oil industry will lead to rising international investments, also in other branches of the economy;	❒ due to quality and other problems, national companies will only be included to a limited extent in the delivery and service in connection with the oil production;
❒ national companies will be included more and more in the supplies and services for oil production	❒ delays in the reconstruction of the oil processing plants will lead to capacity losses in the medium term;
❒ the national oil processing capacities will be reconstructed or developed speedily and supplied with crude oil in the scope of the max. capacity;	

Policy of reform	
❒ the course of reforms in the direction of the market economy will be continued unerringly;	❒ hesitant steps towards the market economy, sustained strong central state influence will hamper economic development;
❒ the privatisation of medium-sized and large companies will continue;	❒ continuing problems in privatising the economy, especially the medium-sized and larger companies;
❒ the missing legal conditions will be established shortly;	❒ lacking legal prerequisites and conditions will lead to a reserved commitment of international firms;

Based on these framework conditions, the Gross Domestic Product of Azerbaijan will develop as follows up to the year 2015:

Fig. 2.1-2: Development of GDP in Azerbaijan



Georgia

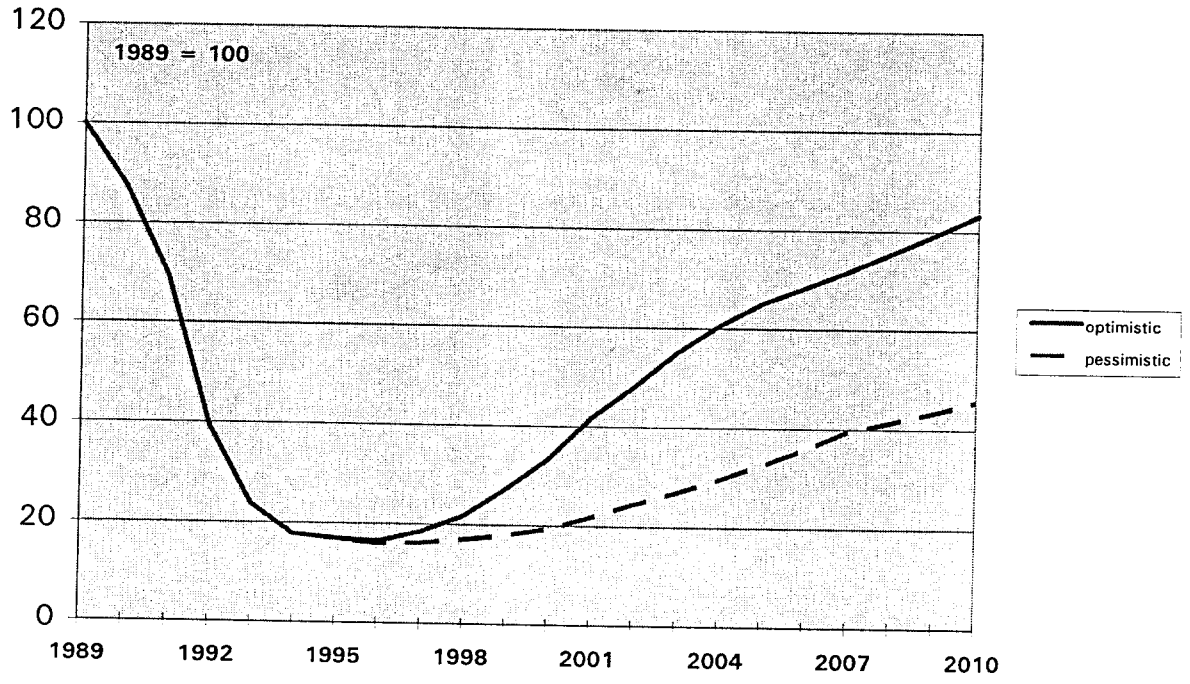
In 1989, Georgia saw the beginning of an economic decline, which continued until 1995. GDP sank to about a third of the 1989 level. Apart from domestic political problems, the economic situation has been negatively influenced by the extremely critical condition of energy supply.

The following scenario forms the basis for the further development:

Optimistic scenario	Pessimistic scenario
Political situation: ❒ the internal political situation in the country will remain stable, ❒ there will be no internal unrest due to social problems; ❒ the conflicts of Abkhasia and South Ossetia will be dissolved by the year 2000 so that they will not influence the economic development negatively any longer;	❒ socio-economic conflicts will burden the internal stability, making more difficult a continuous, consistent policy of reform; ❒ the national conflicts (Abkhasia, South Ossetia) will not be resolved until the year 2000, so that the economic development, especially the transport links, will be influenced negatively further;
Development of the national economy: ❒ the problems in energy supply of the country will be resolved in the short term; ❒ branches of industry which work on the basis of domestic raw materials will be developed at an exceptional speed (non-ferrous and ferrous metallurgy, building materials industry); ❒ income from international transit transports will lead to further impulses for the economic development of the country	❒ the problems of energy supply cannot be solved satisfactorily in the medium term and will lead to further obstruction of industrial production; ❒ existing domestic raw materials will be exported at a relatively low level of processing, the own processing industry develops with insufficient speed; ❒ lacking income from international transit transports will limit the investment possibilities of the country severely;
Policy of reform ❒ the course of reforms in the direction of the market economy will be continued unerringly; ❒ the restructuring process of the national economy will be accelerated ❒ the privatisation of medium-sized and large companies will continue;	❒ hesitant steps towards the market economy, sustained strong central state influence will hamper economic development; ❒ continuing problems in privatising the economy, especially the medium-sized and larger companies; ❒ lacking legal prerequisites and conditions will lead to a reserved commitment of international firms;

This scenario leads to the development of the GDP depicted in the following:

Fig. 2.1-3: Development of GDP in Georgia



2.1.3 Development of main branches of national economy

2.1.3.1 Output of industry

Armenia

Within the economic system of the former Soviet Union, Armenia had a relatively highly developed processing industry, especially in the areas of mechanical engineering, electrical engineering and electronics as well as light industry. Due to the natural conditions prevailing in the country, less material-intensive branches of the economy with a high degree of processing will develop in future and those branches will continue to grow which work on the basis of indigenous raw materials (copper, aluminium, mineral building materials).

The following table contains production data of selected products:

Tab. 2.1-1: Output of selected products in Armenia

	1990	1993	1994
Electric power (bn. kWh)	10,4	6,3	5,6
Non-ferrous metals (tons)	38,604	1,633	1,827
Rolled aluminium (tons)	15,915	899	562
Aluminium foil (tons)	21,394	693	1,117
Synthetic rubber (tons)	1,441	396	2,064
Cement ('000 tons)	1,466	198	128

It is especially the further development of the building materials industry which is of significance for the future transport volume of the railways. Armenia has presently got two cement plants in Ararat and Hrazdan with an annual capacity of altogether more than 2 million tons. There are good prospects especially for the plant in Ararat.

There are several plants for extracting and processing mineral building materials (sand, pearlit, tuff), which are currently using only a little part of their capacities. Thanks to the high quality of the raw materials, there are also good prospects for export.

Azerbaijan

The share of industrial production in the produced national income of Azerbaijan has dropped slightly over the past years and was down to 30.2 per cent in 1994. The most important industrial locations are the peninsula of Apsheron (Baku, Sumgait) with approx. 60 per cent of the country's total industrial production and the area around Gyandsha (10 per cent of industrial production).

Oil production and processing is by far the most important branch of the country's economy. The oil industry yields about 68 per cent (1995) of the total industrial production of the country.

Oil production has decreased since 1990. It dropped from 12.5 million tons (1990) to 9.2 million tons in 1995. In the year 1997 the production of about 9 million tons are planned by the national oil company (SOCAR). This year, the international consortium is also to start producing the so-called 'early oil'. At the moment, there are no exact statements on possible production volumes, however, experts think that production could amount to 0.2 million tons in 1997. For the years to come, figures on the possible AIOC production amounts also differ strongly. They are between 3.5 and 10 million tons per year in 2000, with a lower amount being more probable.

Apart from the contract with AIOC, four more contracts have been concluded with international consortiums or companies for oil production in Azerbaijan.

Azerbaijan has oil processing capacities in Baku. The capacity of the refineries is currently some 12 million t/a, this figure stood at 24 million tons in 1990. At present, this existing potential is not even being used to the full, as their is not enough crude oil available.

Tab. 2.1-2 Oil production and processing in Azerbaijan 1995

	'000 tons	%
Production of crude oil	**9,161**	
Production of oil products	**8,923**	
Export	2,190	24.5
Domestic consumption	6,710	
Petrol	1,040	11.7
Kerosene	617	6.9
Diesel	2,168	24.3
Fuel oil	4,391	49.2
Export of oil products	**2,190**	100.0
Petrol	89	4.1
Kerosene	189	8.6
Diesel	1,625	74.2
Fuel oil	126	5.8
Lubricants	120	5.5

The consultant has had many consultations on the problem of developing prospects of the oil processing industry with national experts of the oil industry, the Azerbaijan oil refineries and economic experts.

As a result, it is assumed that the oil processing industry is going to develop as follows during the forecast period (in million tons):

	optimistic	pessimistic
2000	16,5	12,0
2010	22,0	19,0
2015	25,0	22,0

This is based on the assumption of a corresponding extension of the processing capacities as well as the provision of the necessary crude oil amounts. The crude oil destined for processing need not come only from domestic production, crude oil will

possibly come also from neighbouring countries (e.g. Kazakhstan and Uzbekistan) is processed.

A slight increase in domestic consumption of produced products is assumed as compared to 1995. The remaining amounts will go into export. For possible trade flows and transportation versions compare points 2.1.5.3 and 2.1.6.3.

Georgia

It is especially those branches constituting an important export potential, on the basis of processing domestic raw materials, which play an important part in the economic policy of the country.
This includes first of all the metallurgical industry. There is a stabilisation of the development to be seen in this industry at the moment. A growth of exceptional rates is planned for the coming years.
The chemical industry (Rustavi) and the oil processing industry (Batumi) are further industries of priority.

2.1.3.2 Agricultural production

The natural conditions for agricultural production differ strongly as to the region. Armenia has got the most unfavourable prerequisites. The country is and will remain a net importer of agricultural products and foodstuffs in future. Even with intensive use of the available agricultural areas, the import of grain, for instance, will be absolutely essential. The own production of grain stands at about 200 to 300 thousand tons per year, as compared to a demand of about 600 thousand tons.

The agriculture of Azerbaijan and Georgia, too, will mainly produce for their own demand, in the medium-term. Significant export potentials are not to be expected from this branch of the economy (with the exception of a few selected products such as cotton, tea, citrus fruit).

2.1.4 Development of foreign trade

2.1.4.1 Armenia

The Armenian economy depends on foreign trade to a large extent. In the second half of the 80s, both exports and imports made up more than 50 per cent of the Gross Domestic Product. Just like in all former Soviet republics, the scope and direction of the trade flows were determined, above all, by the high degree of specialisation of the national economies within the system of a planned economy. Exports, especially in the area of mechanical engineering and lighter manufacturing,

were conducted nearly exclusively to the other republics of the Union, whereas raw materials and semi-finished products were imported to a large degree.

The more or less total collapse of the economic, trade and payment transfer system of the countries of the former Soviet Union, as well as the features of economic crisis, especially the drop in industrial production, led to a drastic reduction in the country's imports and exports. In addition, this development was even aggravated by the political and military conflicts between Armenia and Azerbaijan. The Nagorno-Karabakh conflict has led to the situation that Armenia has now got very limited international transport links. The borders to Turkey and Azerbaijan are completely closed to international trade flows. The main connections are maintained via Georgia and by road to Iran. This situation is decisively influencing both the geographical structure of Armenia's foreign trade relations as well as the goods structure, especially of Armenian exports.

Armenian foreign trade is meanwhile characterised by a severe trade balance deficit. In 1996, imports were three times as high as exports.

Geographical structure of Armenian foreign trade

There is a geographical re-orientation in the trade relations of Armenia, which is similar to that of the other Caucasus republics. The role of Western industrialised countries as trade partners is growing. Back in 1990, the share of CIS countries in Armenian exports was still more than 97 per cent. During the subsequent years, this share dropped very significantly and in 1996, it stood at only 41.4 per cent (compare Table 2.1-3). The importance of the CIS countries in Armenian imports also dwindled. Their share dropped from 75.2 per cent in 1990, to 33.6 per cent in 1996.

The political situation in the region is exerting a decisive influence on the direction of the trade flows at the moment. For instance, the significance of Iran as a trading partner has increased by leaps and bounds over the past years. The existing direct transport link (even though only one road connection) between the two countries is a decisive cause for this development. In 1996, Iran was the second largest recipient of Armenian export products with a share of 16.3 per cent, Russia came first with 32.5 per cent. Iran even ranked top in supplying Armenian import goods with a share of 18.1 per cent in 1996.

Russia is still one of the most important foreign trade partners of Armenia. Nearly a third of all Armenian exports went to Russia in 1996 and the Russian share in imports stood at 15.2 per cent. Turkmenistan is the second largest trading partner among the CIS countries, due to extensive deliveries of natural gas, which is delivered by pipeline via Russia and Georgia.

14.1 per cent of all Armenian imports came from the United States, in 1996. This share was even higher in the years before (compare Table 2.1-4). In 1996, nearly 50

per cent of the US-American imports were humanitarian aid. At the moment, Armenia is the CIS republic with the highest per-capita share of US humanitarian aid.

Table 2.1-3: Geographical structure of Armenian Exports 1996
(% of total value)

	1993	1994	1996
EU countries	**10.8**	**16.3**	**21.6**
Belgium	9.5	12.1	15.3
Netherlands	0.1	0.3	3.2
Germany	0.2	3.0	1.3
Iran	3.5	6.8	16.3
Turkey	...	...	2.3
South Africa	...	...	15.2
CIS countries	**80.9**	**73.4**	**41.4**
Russia	37.3	39.0	32.5
Turkmenistan	36.4	30.5	4.0
Georgia	2.0	1.3	2.0
Ukraine	2.6	1.7	1.9

Table 2.1-4: Geographical structure of Armenian imports 1996
(% of total value)

	1993	1994	1996
EU countries	**6.1**	**9.3**	**14.0**
Belgium	1.1	0.4	6.1
Italy	4.4	2.3	1.8
France	0.4	2.7	1.5
Germany	0.1	1.8	1.5
Great Britain	0	0.1	0.9
Iran	6.2	10.8	18.1
Turkey	...	...	0.6
USA	28.9	24.4	14.1
United Arab Emirates	...	...	3.9
Bulgaria	...	...	1.6
CIS countries	**56.1**	**52.1**	**33.6**
Russia	26.7	28.4	15.2
Turkmenistan	25.2	17.7	10.4
Georgia	2.2	4.5	6.4
Ukraine	1.2	1.3	1.2

The political development of the region will play a decisive role in the further development of the geographical structure of Armenian foreign trade. As long as important international transport links are blocked, the significance of Iran will increase further. Iran is generally playing a growing role in the foreign trade relations of the region, as to be seen in the other Caucasus republics.
The neighbouring countries Azerbaijan and Turkey will pick up an important part of Armenian foreign trade again, once the political conflicts have been solved. They will turn into suppliers of badly needed raw materials as well as constitute receptive sales markets. The same applies to the countries of Central Asia, for whose trade relations with Armenia functioning transport links (in transit through Azerbaijan) are an important prerequisite.

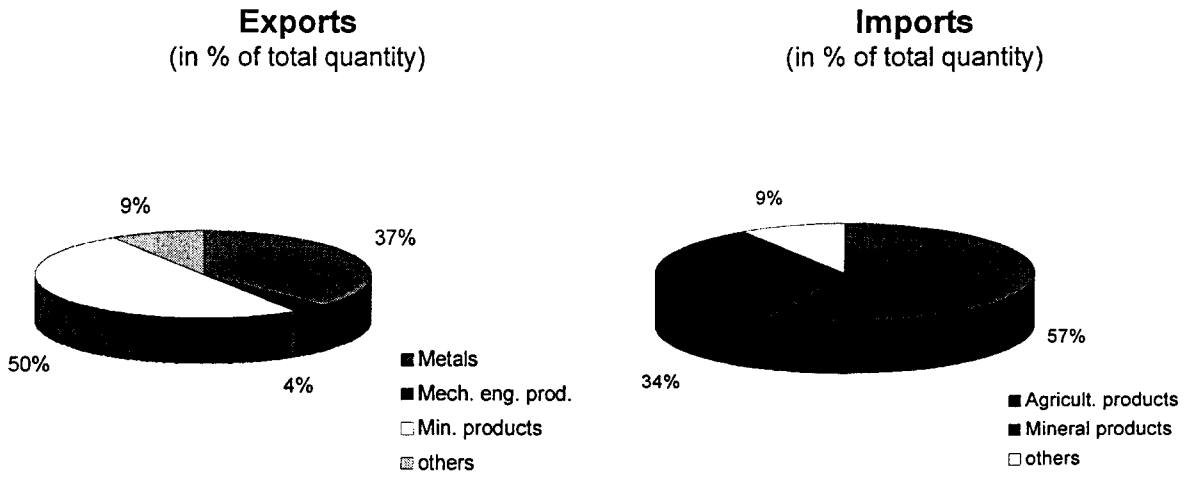
Commodity structure of Armenian foreign trade

The commodity structure of Armenian foreign trade is determined above all by the following factors:

- political tensions in the region with severely restricted transport links from and to Armenia;
- a relatively well developed sector of the processing industry (mechanical engineering, electrical engineering / electronics, lighter manufacturing) as well as a stock of highly skilled workers;
- small deposits of raw materials and fuels;
- weakly developed agriculture due to natural conditions.

Processed products and such requiring little transport constitute the main share of Armenian exports. In 1996, the item of 'precious stones, semi-precious stones, precious metals and commodities thereof' made up some 48 per cent of total exports (on a value basis). Mechanical engineering products constituted approx. 12 per cent of the exports. As regards the goods volumes to be transported, the largest proportion of Armenian exports were mineral products with 50.5 per cent (especially stones and other building materials), metals and metal products stood at 37.1 per cent.

Fig. 2.1-4: Commodity structure of Armenian foreign trade



Armenian imports are dominated by agricultural products and fuels. Agricultural products and foodstuffs made up 56.9 per cent of all imports (based on volume) in 1996. 34.3 per cent were mineral products, which were more or less only oil products (304,000 t).

The commodity structure of Armenian exports will continue to develop in the direction of high-value processed goods, requiring little transport. These are mainly mechanical engineering products, precious stones and metals as well as lighter manufacturing goods. Given the necessary transport links, the export of bulk goods (bricks, cement, other building materials) will increase, especially to the neighbouring countries.

As the country has few own fuel resources, the import of such goods will be necessary also in future. The import will even rise, particularly in oil products. Imports of agricultural produce and foodstuffs will remain necessary due to the insufficient own production.

2.1.4.2 Azerbaijan

The main proportion of the Azerbaijan exports is made up of the products of the oil processing industry. In 1994, they constituted some 35 per cent of the entire exports, in 1995 the share rose to more than 50 %. Products of the textile industry were the second most important item with 18 and 23 per cent respectively. The metallurgical products made up 16 and 3 per cent.

Table 2.1-5: Important export items of Azerbaijan foreign trade

[in tons]

Type of goods	1994	1995
petrochemical products	1,819,108	2,190,481
metallurgical products	348,783	45,073
Bentonit	147,488	68,258
cotton	78,286	75,992
chemical products	74,590	45,427
agricultural products, food.	70,873	37,945

Azerbaijan exported 2.19 million tons of petrochemical products in 1995, which was about 20 per cent more than the previous year.
Iran was the largest importer of Azerbaijan petrochemical products with 1.045 million tons in 1994 and 0.976 million tons in 1995. Georgia was the second largest recipient in 1995 with 0.346 million tons. The share of the CIS countries stood at about 30 per cent (comp. Annex 2.1-10).

Food and agricultural products made up the largest share of Azerbaijan imports in 1995. Detailed data on exports and imports is given in Annex 2.1-5.

With regard to the geographical structure the development is characterised by a sharp drop in the share of the countries of the former Soviet Union. Whereas the share of those countries in the export of 1990 still made up 94.9 per cent and in the import 73.8 per cent, it dropped to 39.6 per cent in export and 34.2 per cent in import, in 1995 (comp. Annex 2.1-2).

2.1.4.3 Georgia

At the moment, the share of CIS countries in Georgian foreign trade is still relatively high. In 1992, the CIS still had a share of 96.3 per cent of Georgian exports and it was 96.8 per cent in the case of imports (comp. Annex 2.1-3).
In 1995, the CIS share in the foreign trade turnover was still more than 50 per cent. At the moment, Russia and Turkmenistan of the CIS represent the main trade partners of Georgia, followed by Turkey, Bulgaria and Romania.

Those branches of industry producing on the basis of domestic raw materials, such as non-ferrous and ferrous metallurgy, the chemical and the petrochemical industries, the building materials industry as well as agriculture, play a vital role in Georgia's exports. Imports focus much on fuels as well as agricultural products and food (comp. Annex 2.1-6).

2.1.5 Present volumes of railway freight transport

2.1.5.1 Total railway freight traffic

Armenia

The transport volume in freight traffic of the Armenian Railway dropped from 33.9 million tons in 1989 to a mere 1.2 million tons in 1996. This represents a reduction down to 3.5 per cent! During the same period of time, the transport performance of 5,121 million tkm was reduced to 351 tkm, i.e. to 6.9 per cent. The main causes for this extreme drop of freight transport volume are:

- the collapse of the Soviet economic system and thus the loss of a large number of deliveries of raw materials and supplied parts as well as the transport of finished products to the other republics of the former Soviet Union

- the economic crisis in Armenia, in whose wake the production in all areas of the national economy were reduced to a minimum

- the interruption of important transport corridors due to the political situation in the Caucasus region (railway lines to Turkey and Azerbaijan/Iran)

Because of the Armenian economy's high degree of dependence on imports of raw materials and supplied parts, imports play a decisive role in the freight traffic of the Armenian Railways. In 1989 some 53.8 per cent of the entire transport volume were made up by imports. In 1996, this share was still 43.4 per cent.

Due to the blockade situation faced by the Armenian Railways, the proportion of exports in the entire transport volume decreased from 23.7 per cent in 1989 to 11.2 per cent in 1996. On the other hand, the domestic transport volume rose from 22.5 per cent to 45.4 per cent in the same period of time.

The goods shipment of the Armenian Railways shows the following structure of commodities:

Tab. 2.1-6: Freight dispatch of Armenian Railways

Type of commodity	1989		1996	
	1000 t	%	1000 t	%
Total	*15,641*	*100.0*	*666*	*100.0*
cement	1,053	6.7	130	19.5
building materials	6,909	44.2	116	17.4
chemical products	310	2.0	8	1.2
industrial raw materials	2,625	16.8	130	19.5
others	4,744	30.3	282	42.4

46.1 per cent of the commodities imported by rail in 1996 were oil products, 25.4 per cent were grain and foodstuffs.

In the past, transit traffic did not play a role for the Armenian Railways. In 1989, only 40,000 t of transit goods were handled. Because of the political situation, there is no transit traffic at all, at present. The following connections constitute potential transit corridors: Dshulfa/Nakhichevan - Yeraskh - Ayrum - Georgia as well as Turkey - Akhurian - Ayrum - Georgia (compare Pt. 2.1.6.2).

Azerbaijan

The transport volume of the Azerbaijan Railways has dropped from 91.4 million tons in 1989 to a mere 9.1 million tons, i.e. to 9.9 per cent. The transport performance has decreased from 41.9 billion tkm to 2.4 billion tkm (5.8 per cent) over the same period.

Due to the economic changes and the political situation in the region, transport flows have changed markedly both in their direction and their composition. Whereas in

1988, transit transports of 37 million tons still made up 40 per cent of the entire transport volume of the Azerbaijan Railways, in 1995, this figure stood at a mere 0.2 million tons, i.e. 2,4 per cent of the total volume. Correspondingly, the share of domestic transports rose to 74.5 per cent in 1995.

Products of the oil processing industry constituted the main part or 76.1 per cent of freight transport of the Azerbaijan Railways in 1995, cotton materials made up some 12.2 per cent (comp. Annex 2.1-12).

The average transportation distance in freight traffic of the Azerbaijan Railways dropped from 458 km in 1989 to 225 km in 1995, which is due to the closure of important transit corridors, such as the Yalama - Baku - Dshulfa line, which is important for transit operations.

Georgia

In Georgia there is a similar development in railway freight transports as compared to Azerbaijan. The entire transport volume dropped from 36.2 million tons in 1988 to 4.7 million tons in 1995, this corresponds with a reduction to 13.0 per cent. The transport performance decreased from 12.6 billion tkm in 1988 to only 1.2 billion tkm in 1995, i.e. to 9.9 per cent (comp. Annex 2.1-13).

The share of transit transports of 37.8 per cent in the total volume of transports, in 1995, was relatively high as compared to Azerbaijan. On the other hand, the share of domestic transports was only 29.1 per cent.

2.1.5.2 Railway freight traffic in main corridors

The following corridors, which are of special importance in the network of the three railways, were subject of a detailed investigation:

- Baku - Gyandsha - Tbilisi - Samtredia - Poti / Batumi
- Baku - Nakhichevan / Dshulfa - Iran
- Baku - Nakhichevan - Yerevan
- Baku - Astara - Iran
- Baku - Yalama - Russia
- Tbilisi - Yerevan - Nakhichevan /Dshulfa - Iran
- Tbilisi - Gyumri - Turkey
- Tbilisi - Samtredia - Sukhumi - Russia

The current situation of railway freight traffic in the quoted corridors is described in the following. The goods flows are divided up according to

- domestic traffic
- export
- import
- transit.

Unfortunately there was not always statistical data available so that in most cases own calculations and assumptions were used.

Baku - Poti / Batumi

The railway line from Baku at the Caspian Sea, via Tbilisi to the Black Sea ports of Poti and Batumi is by far the most important axis for the area at the moment. The significance of this line has even increased because of the blocking of other important international links, due to political tensions in the region. The Azerbaijan Railways cater for about 90 per cent of the entire transport performance on the Baku - Beyuk Kyassik line. The Georgian Railways conduct about 75 per cent of their transports in the corridor of Tbilisi - Batumi/Poti, at the moment.

Scope and composition of the goods flows in this corridor are detailed in the tables below:

Tab. 2.1-7: Westbound traffic in Baku - Poti / Batumi corridor 1995

(in '000 tons)

	Domestic traffic	Exports Azerbaijan	Imports Georgia	Transit
Baku - Gyandsha	3,299	952	26	134
Gyandsha - Tbilisi	0	964	26	134
Tbilisi - Poti	370	109	3	28
Tbilisi - Batumi	410	615	11	126

Tab. 2.1-8: Eastbound traffic in Baku - Poti / Batumi corridor 1995

(in '000 tons)

	Domestic traffic	Exports Georgia	Imports Azerbaijan	Transit
Batumi - Tbilisi	485	45	53	195
Poti - Tbilisi	753	10	240	350
Tbilisi - Gyandsha	0	160	293	54
Gyandsha - Baku	676	155	265	54

The following overview makes clear the strong imbalance of freight flows on the individual lines sections (total transport volume in '000 tons):

	Westbound	Eastbound
Baku - Gyandsha	4,411	1,150
Gyandsha - Tbilisi	1,124	507
Tbilisi - Poti	510	1,353
Tbilisi - Batumi	1,162	778

Baku - Nakhichevan / Dshulfa - Iran

Traffic on this line has been completely ceased at the moment due to the conflict of Nagorno-Karabakh.

In the past, this line was an important transit corridor for rail transports from and to Iran. Exports from the former Soviet Union as well as the Scandinavian countries (wood, paper) to Iran mainly ran via Dshulfa. This route was also important for rail transports from and to Western Europe and was at times used more frequently than the transit route through Turkey.

In 1989, some 2.2 million tons of transit goods were transported via Dshulfa to Iran, and it was 0.1 million tons in the other direction.

Due to differing gauges of the railways in Iran and the former Soviet Union, the goods had to be transshipped in Dshulfa.

Baku - Nakhichevan - Yerevan

In the past, this line used to be of great significance for the exports and imports of Armenia. Eighty per cent of the country's imports and exports were handled in transit through Azerbaijan. In 1989, 61 per cent of all Armenian imports were channelled through Nakhichevan in rail transport.

According to details provided by the Azerbaijan Railways, the following amounts of freight were transported on this line during the period of 1989 to 1991 (in '000 t)

	1989	**1990**	**1991**
to Armenia	10,112	8,107	5,715
out of Armenia	3,138	1,629	497

Baku - Astara

This line is of subordinated significance for railway traffic. It is of interest, above all, for transports to and from Iran. However, the rail track only reaches Astara. Transports from and to Iran are continued by road from that point.

The transport volumes are insignificant at the moment. In 1993, 109 thousand tons were transported in the direction to Iran and 16 thousand tons in the opposite direction. After that the transport volume decreased further.

Baku - Yalama

In the past, this was by far the most heavily used railway line. Nearly the entire rail freight traffic between Azerbaijan, Georgia, Armenia and Russia as well as the other republics of the former Soviet Union was handled via this corridor. Over the past few years, the traffic has been closed down or limited severely due to the situation in Chechnia. The following goods volumes were transported (in '000 tons):

	1989	1990	1991	1995
Northbound	17,770	14,981	13,359	270
Southbound	40,025	37,271	8,723	181

Under normal political conditions in the region, this line is the shortest direct rail link of the three Central Asian republics (except for Kazakhstan) to Russia and the Ukraine. It is also the preferred corridor for direct rail transports from Northern and Central Europe to these countries of Central Asia. Transports from and to Central Asia via the sea ports will rarely use this line (to Novorossijsk on the Black Sea coast), as the Baku - Poti / Batumi connection is considerably shorter:

Tashkent	-	Poti	3,094 km
Tashkent	-	Novorossijsk	3,512 km
Ashkhabad	-	Poti	1,810 km
Ashkhabad	-	Novorossijsk	2,228 km

Tbilisi - Masis / (Yerevan) - Dshulfa - Iran

This line, along which there is no international rail traffic in the direction to Iran at the moment, was of little importance for transit in the past. Transits from and to Iran via Dshulfa were handled more or less exclusively via the line through Azerbaijan as described above. The most important reason for this was that the further connection in transit through Georgia to Russia - a single track line to a large extent - was mainly used for passenger traffic in the past.
The exchange of goods between Armenia / Georgia and Iran was completely insignificant during the times of the Soviet Union.

Tbilisi - Gyumri - Turkey

This line, too, which represents the only direct rail link between Turkey and the CIS states, was used for international freight traffic only to a limited extent in the past. The main reason for this was the insignificant volume of trade between Turkey and the adjoining regions of the former Soviet Union.

In 1992, international traffic between Armenia and Turkey was ceased completely.

Competitive rail transport corridors

Competitive rail connections, which do not cross the territories of Armenia, Azerbaijan or Georgia, mostly relate to transports from and to Central Asia. The following corridors may be regarded, above all, as connections between Europe and Central Asia or the Far East:

1) Western, Central, Northern Europe - Russia - Kazakhstan - Uzbekistan / Turkmenistan / Far East

2) Western, Central, Northern Europe - Russia - Far East (Transsib)

3) Western, Central, Southern and South Eastern Europe - Turkey - Iran - Turkmenistan

It is difficult to present a general assessment of the advantages and disadvantages of the individual corridors, as regards distances, transport times, tariffs etc. The concrete economic advantages and disadvantages of the individual corridors depend decisively on the respective origin or destination, on the type of goods to be transported, demands on transport time and quality and so on.

Furthermore, today and in the future, decisions on the transport route are and will be influenced strongly by political and trade policy aspects, and customs issues play an important role, too. The tariffs to be applied will also be significant in future.

Especially in this area, a possible development is difficult to predict, as all the countries of the region will try to participate in the quickly developing transit market by employing a respective tariff policy.

However, certain origin - destination relations and catchment areas can be determined, for which the one or the other transit route is predestined. The significance of the competing main corridors for selected relations is assessed in the following, assuming a normal political situation and thus unrestricted usability of the respective lines:

Baku - Tbilisi - Poti / Batumi

- main corridor for exports of Azerbaijan to overseas destinations and imports from overseas
- most favourable sea port link for Azerbaijan, Georgia, Armenia
- advantageous sea port link for Uzbekistan, Turkmenistan Tadjikistan, Kyrgyzstan
- great significance for multi-modal transports to the Caucasus region, Central Asia and Northern Iran

Baku - Yalama - Russia

- main corridor for exports and imports of Azerbaijan to Russia, Ukraine, Belarus, Northern and Central Europe in direct rail traffic
- most favourable transit line from/to Central Asia (via the ferry of Baku - Turkmenbashi) from Northern and Western Europe, Western Russia, Ukraine
- transit line for direct railway traffic between Iran, Armenia, Georgia and Russia, Northern Europe

Europe - Russia - Far East (Transsib)

- advantageous link in direct rail traffic between Europe and the Far East via Russian ports on the Pacific Ocean
- favourable direct rail link between Europe and China, Korea

Europe - Russia - Kazakhstan - Central Asia / Far East

- preferred transport corridor for direct railway traffic between Europe and Northern, Western Kazakhstan
- favourable rail link between Europe, Western Russia, Ukraine and Western Uzbekistan
- possible rail link between Europe and China (via Drushba)

Europe - Turkey - Iran - Turkmenistan

- possible rail connection from Southern, South Eastern Europe to Eastern Turkey, Armenia, Iran

- disadvantages of this line for direct rail transports between Europe and Central Asia are the larger distances and difficult infra-structural conditions (e.g. two ferry crossings across the Bosporus and Lake Van)

Turkmenistan - Iran

- possible access of the countries of Central Asia to the Gulf ports (Bandar Abbas)
- currently, however, no through rail connection to the Gulf ports

2.1.5.3 Transportation of main commodities

In the following, the three commodity type groups - oil products, cotton and container goods - are subjected to a detailed investigation, as they have the main share in the transportation volumes at the moment and they are items with the most favourable development chances also in the future.

Oil products

Oil and oil products represent the commodity type group with the largest transportation volume for all three railways. 74.3% of the freight dispatch of the Azerbaijan Railways in 1995 were oil products, and it was 46.0 per cent of the entire transportation volume in the case of the Georgian Railways in the same year. 30 per cent of the freight reception of the Armenian Railways were oil products in 1996.

In Azerbaijan, some 8.923 million tons of oil products were produced in 1995. Some 6.416 million tons out of this figure, that is to say 72 per cent, were transported by railway. Another 0.976 million tons were transported on the sea route (export to Iran). And 17% of the entire transport volume was handled by road transport.

In 1995, Azerbaijan exported 2.19 million tons of oil products. Some 49 per cent were transported by rail, 45 per cent of the total export volume went by sea, and the remaining 6 per cent of the entire export volume was transported by road.

Export by rail in 1995 was distributed as follows along the main corridors (in '000 tons)

Total	**1,064**
Baku - Beyuk-Kyassik (Georgia)	942
for Georgia	*364*
in transit through Georgia	*578*
Baku - Yalama (Russia)	79
Baku - ferry to Turkmenbashi	24

74 % of the entire export volume was made up of diesel fuel, the railways did not transport any crude oil for export.

Furthermore, 136 thousand tons of oil products were transported in transit from Central Asia along the corridor of Turkmenbashi - Baku - Beyuk-Kyassik (Georgia).

In Georgia, some 75 per cent of the oil product transits channelled through the Black Sea ports were shipped at Batumi, in 1995. In the same year, Georgia imported 713 thousand tons of oil products via Poti and Batumi. Out of which 379 thousand tons were for domestic consumption and 334 thousand tons for transit.

Cotton

Apart from the oil products, cotton is one of those types of commodity which guarantees a long-term stable and extensive transport volume for railway traffic. Especially the Central Asian republics belong to the important cotton producers of the world. Uzbekistan is the fifth-largest producer and the second-largest exporter of cotton in the world.

Production and export of cotton has been steadily decreasing in the Central Asian republics and Azerbaijan over the past few years.

Tab. 2.1-9: Production and exports of cotton

(in '000 tons)

	1995/96		1996/97*	
	Production	Exports	Production	Exports
Uzbekistan	1,250	980	1,045	936
Turkmenistan	250	196	131	152
Tadjikistan	120	98	89	87
Kyrgyzstan	22	13	26	13
Azerbaijan	83	65	83	65

* estimate, Source: USDA /FAS

Containers

Container traffic to the three Caucasus republics has increased considerably in recent years. The largest part of the transported containers was handled by the Black Sea port of Poti. The incoming container traffic via Poti port more than doubled from 1994 to 1996.

Tab. 2.1-10: Incoming container traffic via Poti port

	1994		1995		1996	
	TEU		TEU	% to 1994	TEU	% to 1995
Influx total	2,417		4,967	205.5	5,200	104.7
Ø per month	201		414		650	

The share of loaded containers from the Caucasus region which were handled at Poti port represents about 20 to 25 per cent of the incoming amount at the moment.

The containers arriving via Poti port were distributed to the individual destination regions in 1996 as follows (in per cent):

Georgia	29.8
Azerbaijan	21.9
Armenia	42.5
Russia	4.7
Central Asia	1.2

The share of the railways in transporting the containers from the port of Poti differs very much depending on the destination. Some 20 per cent of the containers arriving in Poti port for Azerbaijan were transported by rail from there in 1996. As regards transport to Armenia, the railways' share was 70 per cent.

Some 1,640 loaded containers (TEU) were transported in the relation of Poti - Baku, in 1996, 340 of which were taken over by the railways. Altogether 2,212 TEU went from Poti to Armenia in 1996, and the railways transported 1,582 of them.

The Armenian Railways received 1,582 loaded containers in 1996, 338 TEU (loaded) were handled in dispatch, i.e. 21 per cent of the loaded containers received.

The freight reception in containers of the Azerbaijan Railways amounted to a total of 389 TEU in 1996, and in dispatch the figure stood at 86 loaded TEU (22 per cent of the amount received).

2.1.5.4 Cargo flows through ports of Batumi, Poti, Baku

The current situation as well as the development prospects for the ports of Poti and Batumi have been dealt with in great detail already within the framework of other international projects. Respective TRACECA projects are being processed currently on Baku port and the Baku - Turkmenbashi ferry link. That is the reason why a detailed investigation on this subject area is not be included in the current project.

Cargo flows to and from the mentioned ports are dealt with only to such an extent as they are relevant to railway traffic.

The following cargo flows from and to sea or ferry ports result from the forecast transport volumes:

Tab. 2.1-11: Transports from and to sea ports in railway traffic up to the year 2015

(in '000 t)

	2000		2010		2015	
	opt.	pess.	opt.	pess.	opt.	pess.
Poti						
outgoing traffic	1,789	1,386	2,146	1,679	2,330	1,946
incoming traffic	1,221	1,083	1,612	1,379	1,918	1,660
Batumi						
outgoing traffic	4,609	2,566	7,884	6,338	8,665	7,054
incoming traffic	645	473	825	585	951	695
Baku						
outgoing traffic	273	125	402	387	554	477
incoming traffic	1,605	1,352	2,013	1,659	2,500	1,875

2.1.5.5 Competitive transport modes

Road transport

Unfortunately, the data basis on the initial situation in road traffic is very fragmentary in all three countries. The statistical details on road traffic do not contain anything on the private sector. And the data on road freight traffic of the state sector, are not always very reliable either, as the statistics of the three countries are undergoing a re-structuring process at the moment and data registration in hence incomplete.

Armenia

The volume of road freight traffic in Armenia dropped from 96.6 million tons in 1990 to 2.6 million tons in 1994, i.e. to 2.7 per cent. Thus, the volume of road traffic has decreased even more than the freight transport volume in total. The share of road traffic in the goods transported decreased from 86 per cent in 1990 to 77 per cent in 1994. The reason for this development is to be seen, among others, in the problems of fuel supply of the country.

Road traffic is rather insignificant in the freight transport performance (tkm). In 1994, less than 15 per cent of the entire freight transport performance was taken up by road traffic.

Under the current political conditions, which have led to an interruption of important rail connections from and to Armenia, road traffic plays an extraordinary role for international freight transports of the country. The exchange of goods with Iran is currently of special significance for the foreign trade of Armenia. As there is no rail link between the two countries at the moment, the transports are exclusively handled by road. Road traffic had a share of 48 per cent in the exports of the country, and 44 per cent in the imports, in 1996.

The assumption is that with a normalisation of the political situation in the region and the re-instatement of international railway connections, the proportion of road traffic in the international transports of the country will decrease considerably. In domestic traffic, the role of road freight transport will grow, as in future the share of the processing industry, especially in little material intensive branches, will rise strongly and thus growth is to be expected particularly in those goods' areas associated with truck transport.

Azerbaijan

The cargo volume of 153.1 million tons transported by road traffic in Azerbaijan in 1990 dropped to 12.6 million tons in 1995, i.e. down to 8 per cent. The share of road transport in the entire goods traffic of the country (transport volume) was 69.6 per cent in 1990 and by 1994 it had decreased to a mere 38.4 per cent.

Tab. 2.1-12: Road freight transport in Azerbaijan

	1990	1994	1995
Transport volume ('000,000 t):			
Total	153.1	19.4	12.6
including long-haul	2.6	0.8	0.6
Transport performance ('000,000 tkm):			
Total	3287.1	569.0	388.5
including long-haul	319.7	120.7	79.8

In 1995, there were 100 state-run transport companies conducting freight transports in Azerbaijan. Their vehicle stock comprised 11,900 trucks with an average age of 9 years.

The following table depicts the role of road freight transport in the foreign trade transport of Azerbaijan. It becomes clear that road traffic plays a subordinated role in the export of the country. Its share dropped from 13.2 per cent in 1995 to 6.0 per cent in 1996. The main cause for this is, above all, the structure of the commodities for export, consisting largely of bulk goods, especially oil products (compare Annex 2.1-7). Exports to Iran and Turkey are mainly transported by road. The main reason being the lacking reliable or currently interrupted rail connections.

Tab. 2.1-13: Cross-border road freight transport in Azerbaijan

	1995		1996	
	'000 tons	Share in %	'000 tons	Share in %
Export*				
Total	***218.3***	***13.2***	***139.6***	***6.0***
Russia	18.6	7.2	12.1	3.3
Georgia	18.6	4.7	4.3	0.6
Iran*	75.6	92.8	21.2	79.4
Turkey	33.4	96.5	67.7	93.5
Import				
Total	***548.6***	***37.1***	***779.8***	***40.1***
Russia	16.3	9.8	13.8	6.1
Georgia	7.7	10.8	4.8	6.6
Iran	270.0	98.8	238.5	99.1
Turkey	111.8	88.0	251.4	88.4

* Details on export without sea transport of oil products to Iran (1995 approx. 1 million t 1996 approx. 1.6 million t)
Source: Customs authorities

The share of road traffic is relatively high as regards imports, however, which rose further in 1996 to a total of 40.1 per cent. Imports from Iran and Turkey are being transported more or less exclusively by road.

The share of road transport in exports will not rise significantly in the next years either, as the proportion of bulk goods will remain very high. The share of high-quality processed goods will rise a little. In domestic traffic, the share of road transport will increase markedly once more as a consequence of the further development of market-economy structures and progressing privatisation. It is mainly the development of reliable rail connections, especially in combined traffic, which is of decisive significance for the role of road traffic in imports. The share of road traffic in the transport volume will decrease with the re-instatement of the transit connection via Nakhichevan to Iran. The share of the railways will increase further with its stable quality connection Baku - Poti/Batumi, for transports to and, above all, from Turkey.

Georgia

In Georgia, the transport volume of freight transport by road dropped from 167.1 million tons in 1990 to 5.4 million tons in 1994. This equals a reduction to 3 per cent. As of 1995, however, there has been an increase in road freight transport. The transport volume rose by 55 per cent to 8.7 million tons in 1995 and the transport performance increased by 74 per cent to 130 million tkm. The share of road traffic in the entire freight transport thus was 65 per cent (transport volume). Measured in transport performance, the share of the road was only 10 per cent, however.

With the progressing re-structuring of the economy in the direction of a market economy, the share of road traffic will increase once more over the years to come. This applies especially to domestic traffic. The share of road transport will grow above-average in processed goods.

Inland waterways

Inland navigation shall only be included here in so far as it constitutes direct competition to railway traffic. This applies to the investigated countries only in the case of transportation from and to Baku with seaworthy inland-waterway vessels.

This transport option is an alternative to railway traffic, above all, in the transport of bulk goods, e.g. oil or oil products, to the other CIS republics of from and to the Black Sea ports. At the moment, this possibility of transport is not being availed of, as Russia does not permit the passage of Azerbaijan ships via the Volga-Don Canal or has restricted it severely. Even on settling all political issues, there will still be technical restrictions for this transport route. Navigation on the Russian inland

waterways is limited to about six months per year, due to adverse weather conditions. Furthermore, there are restrictions as to the permissible draught of the ships.

Thus, the possibilities of inland waterway navigation are relatively small as compared to the railways. Transport on inland waterways will be used as a supplement to railway transport but not as a complete alternative in future (comp. Pt. 2.1.5.5).

Pipelines

The future construction and use of pipelines for the transport of crude oil or oil products is of essential significance for the volume of rail traffic.

The international oil consortium (AIOC) as well as the Azerbaijan Government believe that two pipelines are going to be used for the transportation of the Azerbaijan oil. One is to lead through Chechnia to the Russian Black Sea port of Novorossijsk, the other through Georgia to the Black Sea coast (Supsa). A further possibility, through Turkey to the Mediterranean coast, is also being discussed. However, at the moment there are no definite statements as to the point in time of the inauguration and the scope of use for the different versions.

The following findings, which seem secure at the moment, were used for the forecast of the volume of railway traffic:

- only crude oil is going to be transported through the pipelines, which are to be built,
- a transport of crude oil by railway is not planned,
- there are no intentions of building or using pipelines for the transportation of oil products.

2.1.6 Scenarios for freight transport development

2.1.6.1 Total railway freight traffic

The assessment of future transport volume was conducted in two scenarios, an optimistic and a pessimistic one, and to the time horizons of 2000, 2010 and 2015. The assessment of the transport volume of 1997 served as an interim step. The future development was calculated separately for the individual components of railway freight traffic:

Freight dispatch / domestic traffic:

For to be able to calculate the dispatch volume in railway freight traffic, average annual growth rates were determined for the individual main types of goods, based on the overall economic development depicted in Point 2.1.2.2 and Point 2.1.3, for the respective time periods. In determining these growth rates, possible changes in the modal split of the transport modes were taken into consideration within the individual goods type groups (comp. Point 2.1.5.4)

Export transports:

The determination of the annual growth rates was based on the development of the goods structure, the geographical structure of foreign trade and the development of production / domestic requirements.
Possible changes in the modal split and the utilisation of other, competing transport corridors (comp. Point 2.1.5.5) were considered in dependence on the future geographical structure of foreign trade.

Import transports:

The future import volume was established with the help of the same calculation as for export.

Transit traffic:

The possible political development in the region and the usability of the transit corridors connected with it was considered as a decisive factor of influence for the future transit volume.
Furthermore the future economic development and the connected foreign trade development of the Central Asian republics (first of all Uzbekistan and Turkmenistan) were included in the assessment. The future geographical orientation of foreign trade in this region was also an important point in the assessment (comp. Point 2.1.4).

And the development of the foreign trade relations with Iran and Turkey were incorporated, as the region is an important transit area for both these countries.

Armenia

Based on the analysis of the political, economic and foreign trade development of the country, the following scenarios have been drawn up, which are to serve as a foundation for the evaluation of future goods traffic flows:

Optimistic scenario	Pessimistic scenario
Freight dispatch: ❒ the entire freight dispatch will rise slightly again as of 1997 ❒ the items of building materials and cement will develop with above-average rates of increase; the existing rich raw material resources will be utilised intensively in the short-term; due to the very low starting level, the rates of growth over the first few years of the forecast period will be particularly high ❒ as regards the modal split, the share of road traffic will increase further, especially in the dispatch of processed goods; in the transport of bulk goods, the share of the railways will remain relatively high or even increase slightly	❒ freight dispatch will drop slightly once more in 1997 but will rise moderately as of 1989/99 ❒ the use of indigenous raw materials will only progress very hesitantly ❒ as regards the modal split there will be a stronger shift towards road transport, also in the bulk goods, due to infrastructural problems of the railways
Export transports: ❒ export transports will develop initially with the same growth rates as the entire freight dispatch, but as of the year 2000, they will increase even faster due to the normalisation of the political situation ❒ the dominating role of road traffic in selected relations (e.g. Iran) will remain in place until the year 2000, but it will lose in significance with international rail traffic being re-instated	❒ the growth rates will be only insignificantly below those of the optimistic scenario, differences result especially from the time delay in the re-instatement of important international rail connections ❒ road traffic will remain the decisive mode of transport for certain relations up the year 2005, subsequently it will be difficult for the railways to regain lost positions
Import transports: ❒ import transports will develop with lower growth rates than the exports, the cause being the very high trade balance deficit ❒ in connection with political normalisation and the intensification of foreign trade activities, there will be a speedy import increase as of the year 2000 ❒ as regards the modal split, the statements on exports may be applied accordingly	❒ the lower growth rates and time delay in the normalisation of international connections are the only differences to the optimistic scenario

Transit traffic: ❒ railway transit through Armenia will be possible only as of the year 2000	❒ transit traffic from and to Iran via Armenia will be started by the year 2005, transits from Turkey will be handled already as of the year 2000
Average transport distance: ❒ the average transport distance in both scenarios will be 298 km in 1997 and will rise to 310 km as of the year 2000.	

The future development of transit traffic will play an important role for the Armenian Railways. Statements have been made on the significance of transit corridors already under Point 2.1.5.

The following transport volumes are assumed as a basis for transit traffic through Armenia upon a normalisation of the political situation (2000/2005):

Turkey - Azerbaijan / Central Asia v.v.	130,000 tons
Turkey - Georgia v.v.	40,000 tons
Iran - Georgia v.v.	105,000 tons
Iran - Russia v.v.	210,000 tons
Iran - Ukraine v.v.	150,000 tons
Iran - Black Sea ports v.v.	50,000 tons

The current trade flows between the quoted countries and regions served as a basis, taking into consideration the role of competing, traditional transit corridors

Based on the above scenarios, the following annual growth rates (in %) were applied to the development of transport volumes for the individual transport relations and main groups of commodities:

Tab. 2.1-14: Annual growth rates of rail freight traffic of Armenia

	1997 - 2000		2001 - 2010		2011 - 2015	
	opt.	pess.	opt.	pess.	opt.	pess.
Freight dispatch:						
Building materials	5.5...17.5	2.5...7.5	7.0...12.5	4.5...8.0	8.5...10.0	3.5...6.0
Metals	2.0...2.5	0...1.8	1.5...2.0	0.8...1.5	1.5...2.0	1.3...1.8
Cement	5.0...7.5	2.7...5.5	4.5...5.7	0.9...1.6	4.5...5.0	2.6...3.4
Cereals, foodstuff	0...3.3	-2.5...2.0	2.0...2.5	0.7...1.4	4.6...5.5	1.9...2.8
Others	2.5...7.6	-5.0...4.8	4.8...5.6	2.9...3.7	4.8...5.5	2.0...2.5
Exports	2.0...12.0	-2.5...7.5	6.5...8.5	4.6...5.7	8.5...11.0	8.0...10.5
Imports	7.5...10.5	0.5...7.0	4.5...5.8	3.0...3.5	3.6...4.5	2.6...3.2

Based on these rates of development, the following transport volumes may be deduced up to the year 2015:

Tab. 2.1-15: Transport volume of the Armenian Railways up to the year 2015

	1996	2000		2010		2015	
		opt.	pess.	opt.	pess.	opt.	pess.
transport volume ('000 t)	1,177	2,269	1,535	3,357	2,242	4,238	2,726
transport performance ('000 000 tkm)	351	703	476	1,041	695	1,314	845

Azerbaijan

The following basic assumptions were made for the two scenarios:

Optimistic scenario	Pessimistic scenario
Freight dispatch: ❒ the entire freight dispatch volume of the railways will decrease once more in 1996, but as of 1997, a continuous increase will start, the increase in 1997 will be about 5 per cent, and up to the year 2000, the freight dispatch will increase annually by about 12 to 15 per cent, after that the growth rate will slow down to 2 to 5 per cent; ❒ the production of petrochemical products is of decisive importance for the entire dispatch volume, following a small decrease in 1996 production will grow again as of 1997, ❒ there will be above average growth rates from 1997 on also in building materials (rich national raw material deposits, increasing demand); ❒ with regard to the modal split, there will only be insignificant changes in the type of goods important for the railways (mass goods), road transport will grow significantly in the area of high-value goods; crude oil will be transported by pipeline only	❒ the development in the pessimistic scenario differs only little from the optimistic one for most types of goods, and the growth rates are only insignificantly lower; ❒ the main differences between the two scenarios are determined by petrochemical products; following a decline in 1996, production will pick up again as of 1997, but after 2000 will be 3 to 5 million tons/a lower than the level of the optimistic scenario; ❒ especially for the item „other goods", the share of road transport will grow more rapidly, due to infrastructural problems of the railways;

Export transports: ❒ the amount of export transports will be determined mainly by the production level of petrochemical products, the volume produced over and above the level of national consumption (5 to 7 million t) will be exported; ❒ the share of countries in the Azerbaijan export for which a shipping through the Black Sea ports is favourable will increase; ❒ the export of petrochemical products to Iran (maritime traffic share) will not increase further, and will rather drop as of 2000; ❒ due to the opening of the Nakhichevan/ Dshulfa line, exports to Iran will be forwarded in this corridor once more;	❒ due to a lower production level in petrochemical products and a continuing domestic need of the same magnitude, the amount of goods remaining for export will be reduced; ❒ a slightly rising share of the Central Asian countries in Azerbaijan exports, thus a smaller transport volume on the network of the Azerbaijan Railways; ❒ the same or a slightly growing share of exports of petrochemical products to Iran by sea;
Import transports: ❒ in contrast to the exports, imports will rise slightly also in 1996 and later on; ❒ the food imports (food aid) will decrease; ❒ growing import volumes of equipment for oil production and other investment projects (e.g. Sumgait);	❒ differences to the optimistic scenario result, above all, from to lower annual growth rates;
Transit traffic: ❒ the optimistic scenario says that the important transit lines via Yalama to Russia and via Dshulfa to Iran will be available without restrictions again by the year 2000; ❒ already in 1996, the transit traffic via Baku/ferry will be about 200 kt above the 1995 level (cotton and petrochemical products from Central Asia, investment goods and food products to Central Asia);	❒ the political situation will only allow for a limited scope of transit traffic from and to Russia via Yalama, traffic via Dshulfa will continue not to be possible at all; ❒ all existing transit routes will be available without restrictions by 2010, however, the volume will then be lower than in the optimistic scenario, due to a meanwhile other orientation of important transit flows;
Average transport distance: ❒ the average transport distance will remain at the level of 1995 (265 km) up to 1997 and will then rise to 438 km (opt.) / 421 km (pess.) by 2000;	

Based on the above scenarios, the following annual growth rates (in %) were applied to the development of transport volumes for the individual transport relations and main groups of commodities:

Tab. 2.1-16: Annual growth rates of rail freight traffic of Azerbaijan

	1997 - 2000		2001 - 2010		2011 - 2015	
	opt.	pess.	opt.	pess.	opt.	pess.
Freight dispatch:						
Oil products*						
Building materials	5...45	3...30	3.0...3.5	2.5...3.2	1.8...2.2	2.0
Metals	7.5...15	3.0...7.5	2.9...3.6	1.0...1.5	1.7...2.0	1.5...1.8
Cement	2...5.4	1.8...5.0	3.0...3.5	2.5...3.2	1.8...2.2	2.0
Cereals, foodstuff	2.9...3.4	1.5...3.0	2.0...2.5	2.0...2.3	2.0	1.8
Others	5.0...12.5	3.0...10.5	4.5...5.5	4.0...4.5	4.0...4.5	4.0
Exports	2.0...8.5	1.0...7.0	4.0...6.5	3.8...6.0	1.0...1.5	0.8...1.2
Imports	7.5...10.5	6.5...9.5	5.0...5.5	4.0...4.3	5.0...6.5	4.5...5.0

* For oil products see Pt. 2.1.6.3

Based on the framework conditions described above, the following total transport volumes and transport performance result for the forecast period:

Tab. 2.1-17: Transport volume of the Azerbaijan Railways up to the year 2015

	1995	2000		2010		2015	
		opt.	pess.	opt.	pess.	opt.	pess.
transport volume ('000 t)	9,073	20,102	14,512	29,690	24,757	34,825	29,046
transport performance ('000 000 tkm)	2,409	8,805	6,109	13,004	10,423	15,253	12,229

Georgia

The following scenario was developed for the Georgian Railways:

Optimistic scenario	Pessimistic scenario
Freight dispatch:	
❒ the entire freight dispatch volume of the railways will rise already in 1996, and there will be another 7 to 10 % increase in 1997;	❒ the development in the pessimistic scenario differs only a little from the optimistic one for most types of goods, and the growth rates are only insignificantly lower;
❒ there will be an average growth of approx. 10 % up to the year 2000;	❒ especially for the item „other goods", the share of road transport will grow more rapidly due to infrastructural problems of the railways;
❒ with regard to the modal split, there will only be little change in the type of goods important for the railways (mass goods), like in Azerbaijan, road transport will see considerable increases in high-value goods;	

Export transports: ❒ export transports will develop similarly in both scenarios, coupled with the volume of the entire freight traffic;	
Import transports: ❒ import transports will decrease significantly with the reduction of cereals supplies (food aid) in 1996 and 1997; ❒ commercial imports will develop with similar growth rates as the exports;	
Transit traffic: ❒ transit transports through Georgia will be determined mainly by exports of petrochemical products from Azerbaijan as well as by transits from and to Central Asia and Armenia, and the same assumptions apply as established for Azerbaijan above;	
Average transport distance: ❒ the average transport distance in both scenarios will be 270 km in 1997 and will rise to 340 km as of the year 2000.	

Based on the above scenarios, the following annual growth rates (in %) were applied to the development of transport volumes for the individual transport relations and main groups of commodities:

Tab. 2.1-18: Annual growth rates of rail freight traffic of Georgia

	1997 - 2000		2001 - 2010		2011 - 2015	
	opt.	pess.	opt.	pess.	opt.	pess.
Freight dispatch:						
Coal	15...25	5...12.5	4.7...5.2	1.8...2.3	2.5...3.2	3.0
Oil products	7.5...8.5	4.8...5.5	3.0	2.4...2.9	2.7...3.0	2.5...2.9
Building materials	10...25	9.0...12.5	4.5...6.0	4.0...5.2	2.5...3.0	3.0
Ore	7.0...8.5	5.0...10.0	1.8...2.5	1.5...2.0	2.4...3.3	2.8
Cement	10...25	5.5...12.5	4.5...6.5	3.5...4.5	2.5...3.0	2.4...2.9
Cereals, foodstuff	6.5...9.0	4.5...7.5	1.7...2.2	1.5...2.0	2.6...2.8	2.5...2.7
Metals	15...17.5	5.0...8.0	5.5...6.5	3.5...4.5	2.9	2.9
Others	7.5...11.5	4.5...7.0	3.0...4.0	1.8...2.2	1.8...3.4	2.5...3.0
Exports	7.5...12.0	3.0...6.5	5.0...6.5	4.5...6.0	5.0	4.8
Imports	1.5...5.0	-2.5...4.5	2.0...2.5	1.8...2.4	2.5	2.0

Using these growth rates, the following transport volumes are deduced for the forecast period:

Tab. 2.1-19: Transport volume of the Georgian Railways up the year 2015

	1995	2000		2010		2015	
		opt.	pess.	opt.	pess.	opt.	pess.
transport volume ('000 t)	4,700	9,525	6,086	15,268	11,605	17,470	13,700
transport performance ('000 000 tkm)	1,246	3,238	2,069	5,191	3,946	5,940	4,658

2.1.6.2 Traffic forecast for main transport corridors

Baku - Poti / Batumi

Based on the current situation along this corridor, as depicted in Point 2.1.5.2, two scenarios were drawn up for the development of freight traffic up to the year 2015. This forecast embraces the same basic assumptions as they were set up for the development of the entire freight traffic.

As regards the distribution of cargo flows among the ports of Poti and Batumi, the assumption was of more or less equal proportions within the forecast period. The cargo flows on the line sections of Tbilisi - Poti / Batumi also comprise the transports in and out of the direction of Armenia.

It was assumed for the transportation of oil products exported from Azerbaijan that approx. 75 per cent of the total amount to be transported by the railways would be conducted via this route.

Deduced from the above assumptions, the following cargo flows result for the respective line sections. A breakdown into individual components of the cargo flows is contained in Annexes 2.1-14 to 2.1-17.

Tab. 2.1-20: Westbound traffic in the Baku - Poti / Batumi corridor

(in '000 t)

	2000		2010		2015	
	opt.	pess.	opt.	pess.	opt.	pess.
Baku-Gyandsha	10,354	7,494	15,409	12,782	17,583	14,587
Gyandsha-Tbilisi	6,587	4,015	10,160	8,305	11,277	9,209
Tbilisi-Batumi	5,124	3,037	8,527	6,845	9,405	7,635
Tbilisi-Poti	2,209	1,738	2,712	2,120	2,982	2,452

Tab. 2.1-21: Eastbound traffic in the Baku - Poti / Batumi corridor

(in '000 t)

	2000		2010		2015	
	opt.	pess.	opt.	pess.	opt.	pess.
Gyandsha-Baku	2,008	1,575	2,849	2,463	3,435	2,919
Tbilisi-Gyandsha	1,034	890	1,648	1,483	2,074	1,784
Batumi-Tbilisi	988	758	1,301	956	1,503	1,112
Poti-Tbilisi	1,436	1,267	1,902	1,619	2,252	1,929

There will only be insignificant changes in the structure of the type of goods for the forecast development of the freight traffic volume in the transport corridor of Baku - Tbilisi - Poti/Batumi.

Tab. 2.1-22: Development of the goods structure in the corridor of Baku - Tbilisi - Poti/Batumi (westbound traffic)

Type of goods	East - West - direction (opt. scenario)			
	1995	2000	2010	2015
total	100.0	100.0	100.0	100.0
petrochemical products	95.5	89.9	89.4	88.9
coal, coke	0.1	0.0	0.0	0.0
ore	0.0	0.9	0.9	0.8
ferrous metals	0.3	1.5	1.7	1.8
timber	0.1	0.0	0.0	0.1
mineral building materials	0.5	0.3	0.4	0.6
cement	0.3	0.1	0.1	0.2
mineral fertiliser	0.0	0.0	0.0	0.0
cereals	0.3	0.1	0.1	0.1
others	2.4	7.3	7.3	7.5

Petrochemical products will continue to determine transport in the westbound traffic. Their share will decrease to slightly below 90 per cent by the year 2015. On the other hand, the share of other processed products will increase a little.

There are only insignificant differences between the optimistic and the pessimistic scenario with regard to the structure of the type of goods.

Tab. 2.1-23: Development of the goods structure in the corridor of Baku - Tbilisi - Poti/Batumi (eastbound traffic)

Type of goods	West - East - direction (opt. scenario)			
	1995	2000	2010	2015
total	100.0	100.0	100.0	100.0
petrochemical products	1.1	1.2	1.2	1.0
coal, coke	0.0	0.1	0.1	0.1
ore	12.6	12.9	12.8	10.6
ferrous metals	8.3	15.6	16.2	18.7
timber	0.0	0.0	0.0	0.0
mineral building materials	2.8	7.5	8.4	8.5
cement	0.1	0.6	1.3	1.2
mineral fertiliser	3.7	4.3	4.3	4.1
cereals	62.3	35.5	30.5	28.7
others	9.1	22.3	25.2	27.1

The share of cereals will drop considerably in the eastbound traffic, due to the decreasing food aid for the countries of the region. The share of investment goods, consumer goods and other processed goods will grow.

There are only insignificant differences between the optimistic and the pessimistic scenario with regard to the structure of the type of goods, also in the eastbound traffic.

Baku - Nakhichevan / Dshulfa - Iran

The scope of future freight flows along this corridor depends, above all, on the further political development in the region. In drawing up the forecast, it was assumed that the traffic to and from Nakhichevan will operate normally as of the year 2000, in the optimistic scenario, and that railway traffic will be resumed along this line as of the year 2005 at the earliest, in the pessimistic scenario.

The freight flows were first of all broken down into their individual components: domestic traffic, exports/imports Azerbaijan, exports/imports Armenia as well as transit traffic to and from Iran. An initial level was assumed for domestic traffic which corresponds with the total level of freight traffic of the Azerbaijan Railways in the year 2000, as compared to the initial basis of 1988.

Transit traffic mainly consists of freight flows between Iran and Russia as well as the other CIS republics and the Scandinavian countries through the corridor of Baku - Yalama. It has to be added that it is especially wood, wood products and paper cardboard which are transported in the North-South direction.

The same rates of increase as for the entire railway traffic of Azerbaijan (or Armenia respectively) were used for the development of the individual segments (comp. Pt. 2.1.6.1). The difference between the optimistic and pessimistic scenarios as of the year 2010 is greater, particularly in transit traffic than on other line sections, as, due to the late re-instatement of the traffic, transport flows will have shifted to other corridors or modes of transport.

Freight traffic will develop as follows over the forecast period:

Tab. 2.1-24: Freight traffic in Baku - Nakhichevan / Dshulfa corridor

Baku - Nakhichevan:

(in '000 t)

	2000		2010		2015	
	opt.	pess.	opt.	pess.	opt.	pess.
Domestic traffic	265	-	379	322	451	417
Azerb. exports	355	-	630	421	690	554
Transit to Iran	1,063	-	1,175	716	1,288	926
Armenian imports	253	-	317	268	431	294
Total	*1,936*	-	*2,501*	*1,727*	*2,860*	*2,191*

Nakhichevan - Baku:

(in '000 t)

	2000		2010		2015	
	opt.	pess.	opt.	pess.	opt.	pess.
Domestic traffic	44	-	63	56	74	65
Azerb. imports	151	-	321	266	365	314
Transit from Iran	310	-	315	151	421	260
Armenian exports	30	-	32	28	58	42
Total	*535*	-	*731*	*501*	*918*	*681*

Baku - Astara

In future, this line will remain rather insignificant for railway freight traffic. This railway link does not play a great role in the considerable exchange of goods between Azerbaijan and Iran. Exports and imports of Azerbaijan from and to Iran via Astara will be transported by road to a large extent, as the cargo would have to be shifted onto trucks in Astara anyway. This connection will in future be used more than today for transits from and in the direction of Russia via Yalama. It has to be added that the connection via Dshulfa or the sea route will bear the main part.

Tab. 2.1-25: International freight traffic in the Baku - Astara corridor

Baku - Astara:

(in '000 t)

	2000		2010		2015	
	opt.	pess.	opt.	pess.	opt.	pess.
Azerb. exports	109	75	115	90	115	90
Transit to Iran	45	30	75	45	95	60

Astara - Baku:

(in '000 t)

	2000		2010		2015	
	opt.	pess.	opt.	pess.	opt.	pess.
Azerb. imports	35	15	46	27	85	30
Transit from Iran	35	30	55	40	75	56

Baku - Yalama

In future, this line will be of significance, above all, for international traffic. It is of more or less no importance for the domestic railway traffic of Azerbaijan (with the exception of the Baku - Sumgait section).

The improvement of the political situation in Chechnia, in order to prevent any impediment of railway traffic in future, is the prerequisite for a growth of transport volumes along this line. The forecast is based on the assumption that normal railway freight traffic can be conducted along this route once more as of the year 2000.

In future, some 15 per cent of all Azerbaijan exports by rail will run through this corridor, and in the case of imports, the percentage is approximately 30 per cent. (The line to the Black Sea ports of Poti /Batumi represents the main connection for Azerbaijan exports)

On re-instating the railway line from and to Nakhichevan - Dshulfa - Iran, the connection Baku - Yalama - Russia will gain in importance significantly for transit traffic. The following transport volumes were identified for international traffic during the forecast period:

Tab. 2.1-26: International freight traffic in the Baku - Yalama corridor

Baku - Yalama:

(in '000 t)

	2000		2010		2015	
	opt.	pess.	opt.	pess.	opt.	pess.
Azerb. exports	965	480	1,564	1,328	1,638	1,375
Transit to Russia	809	419	921	647	1,238	889

Yalama - Baku:

(in '000 t)

	2000		2010		2015	
	opt.	pess.	opt.	pess.	opt.	pess.
Azerb. imports	365	348	537	498	736	703
Transit from Russia	1,863	335	2,134	1,395	2,616	1,860

Tbilisi - Armenia - Dshulfa - Iran

Railway transit through Armenia will develop with the normalisation of the political situation in the region and the re-instatement of railway traffic via Nakhichevan / Dshulfa. However, there will be strong competition by the traditional transit line through Azerbaijan, along which the main part of transit from and to Iran will be handled also in future.

It will be primarily foreign trade goods of Georgia as well as transit traffic between Iran and Ukraine as well as Russia which will run through Armenia in transit. The foreign trade transports of Armenia via the Black Sea ports constitute an important share of the cargo flows along the Tbilisi - Armenia section.

Tab. 2.1-27: International freight traffic in the Tbilisi - Armenia - Dshulfa corridor

Southbound:

(in '000 t)

	2000		2010		2015	
	opt.	pess.	opt.	pess.	opt.	pess.
Exports Georgia	44	11	83	37	125	68
Imports Armenia	403	617	650	499	723	571
Transit	240	-	302	156	378	195

Northbound:

(in '000 t)

	2000		2010		2015	
	opt.	pess.	opt.	pess.	opt.	pess.
Imports Georgia	75	-	183	132	207	167
Exports Armenia	106	142	214	148	303	220
Transit	180	-	225	112	281	139

Tbilisi - Gyumri - Turkey

The same may be said for this corridor as for the Tbilisi - Nakhichevan line as regards the initial political situation. The transport volume in the cross-border railway traffic between Turkey and Armenia, however, will remain insignificant during the forecast period.

Transports between Turkey and Azerbaijan as well as the Central Asian Republics will constitute the main volume, which will reach a scope of 130 thousand tons (in both directions) by the year 2000. This relates to the optimistic scenario, traffic will only be resumed in the year 2005 at the earliest in the pessimistic scenario.

Foreign trade transports between Turkey and Georgia in railway traffic along this line will take on a volume of 40 thousand tons by the year 2000 (optimistic scenario, traffic in both directions).

2.1.6.3 Traffic forecast for main groups of commodities

Oil products

The forecast of the transport volumes of Azerbaijan oil products in rail traffic are based on the production numbers contained in Point ...

Domestic consumption will rise from 6.7 million tons in 1995 to 10.25 million tons in 2015. The difference between production and domestic consumption will be exported. The assumption is made that the share of railway traffic in total exports will rise from 49 per cent in 1995 to 65 per cent in 2015. Transportation of oil products by pipeline is not envisaged during the forecast period. On the other hand, crude oil will be transported exclusively by pipeline.

Tab. 2.1-28: Freight dispatch and exports of oil products of Azerbaijan

(in '000 t)

	2000		2010		2015	
	opt.	pess.	opt.	pess.	opt.	pess.
Total freight dispatch by rail	11,880	8,640	18,611	15,721	21,403	18,079
Total exports	9,550	5,050	13,900	10,900	14,750	12,500
Exports by rail	5,730	3,030	9,035	7,085	9,588	8,125

The transport of oil products by railway will be distributed to the respective corridors during the forecast period as follows:

Tab. 2.1-29: Destinations of Azerbaijan exports of oil products by rail

(in '000 t)

Destination	2000		2010		2015	
	opt.	pess.	opt.	pess.	opt.	pess.
Georgia	397	369	407	383	413	388
Black sea ports	3,842	1,923	6,467	5,346	6,943	5,785
Yalama - Russia	893	438	1,329	1,028	1,329	1,169
Nakhichevan - Armenia/Iran	315	-	504	314	587	471

In addition, oil products from Central Asia will be transported in transit through Azerbaijan. The transport volumes will rise from 530 / 405 thousand tons (opt. / pess.) in the year 2000 to 825 / 620 thousand tons in 2015.

Cotton

Production and thus also export of cotton of the Central Asian Republics and Azerbaijan will not increase significantly over the next years. One important reason for this, apart from the general problems of agriculture of the CIS republics, is that at the moment parts of the irrigated agricultural areas are being used more and more for growing grain, in order to improve the own supply, in all countries. The export volume and thus the transport volume altogether should stabilise at the current level or drop slightly in the long-term.

The use of the railway lines through Azerbaijan and Georgia depends, above all, on the future distribution of the sales markets for Central Asian cotton. Europe is playing an increasing role for the export of these countries. The export to this region is conducted both via Baltic as well as Black Sea ports. The most favourable transport route for both destinations is that from Central Asia using the Turkmenbashi - Baku ferry and the further transport via Yalama (to the Baltic region) or Beyuk-Kyassik (Black Sea). The assumed total transport volume of cotton along these two corridors is 300 - 500 thousand tons per year during the forecast period, which was integrated in the calculations of Pt. 2.1.6.2.

Containers

The forecast for container volume for the two corridors of

- Poti - Tbilisi - Baku - Turkmenbashi and
- Poti - Tbilisi - Yerevan / Armenia

was drawn up for the period until 2015. The following basic assumptions were made for the forecast:

- Container volume at Poti port will grow by an annual 25 per cent (opt. scenario) by the year 2000, as of then, the annual growth up to the year 2010 will be 10 per cent, as of 2011 it will be an annual 5 per cent. In the pessimistic scenario, the annual growth rates are 15 % / 5 % / 5 % respectively. As regards the volume to Central Asia, the assumption was made that the degree of container use will have reached the same level as with transports to Azerbaijan by the year 2000.

- Analogous rates of increase were applied for the container volume from Armenia and Azerbaijan to Poti, so that the ratio of loaded/unloaded containers will remain roughly the same.

- On establishing the annual growth rates, the respective countries' increase in goods volume of imports was also taken into consideration as well as a further rise in the degree of container use.

- Container volume from the direction of Central Asia to Poti will be determined primarily by the transport of cotton over the next years. Uzbekistan is planning to transport some 35,000 tons of cotton in containers via Baku to Poti every year. 1997 was decided as the starting point for these transports with 500 containers for the time being. After that, the annual volume will rise until the full scope is reached in 1999.

- One has to assume for the container transports in the relations investigated that the number of empty containers to be transported corresponds, in principle, with the number of transported ones in the opposite direction.

- The share of railway transport in total container traffic will rise to 40 per cent in the relations of Poti - Baku and Poti - Tbilisi in 1997, and as of the year 2000, it will be 75 per cent (pessimistic scenario 30 % / 50 % respectively). The share of the railways in the Poti - Yerevan relation will be 70 per cent in 1997 and as of 2000 it will also be 75 % (pessimistic scenario 65 % / 70 % respectively).

Based on these basic assumptions, the following container flows result for railway traffic during the forecast period:

Tab. 2.1-30: Freight volumes in container traffic up to 2015

(loaded containers / TEU)

	1997		2000		2010		2015	
	opt.	pess.	opt.	pess.	opt.	pess.	opt.	pess.
Poti - Tbilisi	580	400	2,124	1,014	4,779	1,902	5,974	2,378
Poti - Baku	820	566	3,003	1,434	6,757	2,689	8,446	3,361
Poti - Turkmenb.	94	86	1,043	751	1,760	1,172	2,200	1,465
Poti - Armenia	1,936	1,653	4,050	2,708	9,113	3,627	11,391	4,534
Tbilisi - Poti	174	120	637	304	1,434	685	1,792	856
Baku - Poti	180	124	659	315	1,483	708	1,854	885
Turkmenb. - Poti	500	500	5,375	3,450	12,094	6,649	15,117	8,086
Armenia - Poti	493	421	1,031	689	2,319	1,108	2,899	1,385

2.2 Passenger Traffic Forecast

2.2.1 Methodology

The application of traditional West European mathematical and statistical procedures for forecasting passenger flows is connected with considerable problems in predicting the development of passenger traffic in the Caucasus republics and would lead to very doubtful results. The reasons for this are especially

- the structural break due to serious political and economic changes in the transition from the centrally planned economy to a market economy, starting in 1988/89,

- the change in values and travel motivations in this transition, sparked off by a changed income and expenditure structure within the population,

- changed destinations for private and business trips due to the disappearance of state restrictions and a re-orientation of trade and tourism relations,

- the disappearance of state regulations for the modal split of transport as well as the dismantling of state regulations and subsidies of fares.

It is more or less impossible to register these manifold changes of the different factors of influence, which have grave consequences, with traditional procedures.

That is the reason why a methodology specially geared to the conditions of the CIS states was chosen, which enables a more exact consideration of the special conditions for the development of passenger traffic in the countries to be investigated, by including a number of most varied factors of influence and scrutinising and assessing these using the specific filter of the respective country.

Selecting from the most diverse factors of influence on travel demand and choice of the mode of transport, the following were subjected to an assessment of the current situation and their development:

- ❒ political situation in the country and the region
- ❒ macroeconomic development
- ❒ development of the population
- ❒ income, rate of unemployment
- ❒ foreign trade and international economic relations
- ❒ active and passive tourism
- ❒ individual car ownership

On the basis of assessing these factors specifically for the individual country and a special interlinking, the possible development of total passenger traffic was established. Derived from these findings, annual growth rates were calculated for the

transport volume, heeding also the probable changes in the modal split. The differentiation was between:
- regional traffic (generally up to 50 km)
- domestic traffic (long-haul traffic)
- international traffic.

Usually the year 1995 served as a starting point, however, the level of 1988/89 and the development over the subsequent years was included in the assessment as an orientation. The assessment was conducted in the form of an optimistic and a pessimistic scenario.

2.2.2 Present volumes of passenger traffic

Similarly to freight traffic, there have been serious changes also in passenger traffic over the past years. Both the number of persons transported as well as the transport performance have decreased considerably in all three republics. This is true without exception for all three modes of transport. During these years some significant shifts in the modal split have emerged. The current situation is depicted for each of the three countries individually in the following:

Armenia

In the table below, the development of passenger traffic is shown for the years of 1990 to 1995. Unfortunately, the details on road transport only comprise the passengers handled by state companies. They do not cover public transport in towns and cities. The data on road and air transport for 1996 represent own calculations based on the results from January to September.

Tab. 2.2-1: Passenger transport in Armenia

	1990	1992		1994		1996	
	'000 000	'000 000	% to '90	'000 000	% to '90	'000 000	% to '90
Total	382.766	185.759	48.5	70.770	18.5	86.131	22.5
Rail	3.528	2.910	82.5	3.495	99.1	1.859	52.7
Bus	377.398	181.996	48.2	66.672	17.7	83.218	22.1
Air	1.840	0.853	46.4	0.598	32.5	1.054	57.3

The number of passengers transported thus dropped to less than a third during the period of 1990 to 1996. This decrease applies mainly to the public, state bus services. Unfortunately there is no official data available on the private bus services. As of 1995, there is a growing trend in road passenger transport. The share of road traffic in the total transport of passengers was far more than 90 per cent in 1996. As there are more and more private competitors on the market, the number of actually

transported passengers and thus the share of road transport in the entire volume of passenger traffic is higher than reflected in the table.

There was a sharp fall in the transport volumes in rail passenger traffic only in 1995. Until 1994, there were annual increases in part. In 1996 the number of transported passengers was only 53 per cent of the 1994 level, as compared to 1988, this represented a mere 40.6 per cent.

Tab. 2.2-2: Rail passenger traffic of Armenia

	1988	1991	1993	1995	1996
Rail, total					
1,000	4,575	2.803	2,884	2,969	1,859
'000 000 pkm	417.2	319.8	435.2	165.9	84.2
Ø km	91	114	151	56	45
Regional traffic					
1,000	2,896	1,608	1,901	2,807	1,823
'000 000 pkm	70.6	35.1	116.6	135.8	76.3
Ø km	24	22	61	48	42
Domestic long-haul					
1,000	...	179	144	163	36
'000 000 pkm	...	36.2	41.7	30.1	7.9
Ø km	...	202	290	185	218
Internat. traffic					
1,000	...	1,016	839	0	-
'000 000 pkm	...	248.4	277.0	0	-
Ø km	...	244	330	248	-

Regional traffic has the main share in passenger transport of the Armenian Railways. The share of passengers transported was 57 per cent in 1991 and it reached 98 per cent in 1996. The proportion of passenger transport performance rose from 11 per cent in 1991 to 97 per cent in 1996.

Domestic long-haul and international traffic displayed the most significant drops in passenger transport by railway. The domestic long-haul traffic is insignificant for Armenia, due to the geographical conditions. Its share in the passengers transported was 6 per cent in 1991 and only 2 per cent in 1996.

As of May 1995, the last international line in passenger traffic of the Armenian Railways, Yerevan - Tbilisi was closed down. There exist plans to reopen this connection in 1997.

Azerbaijan

In Azerbaijan, too, the number of passengers handled by public transport services dropped considerably between the years of 1989 to 1995. This applies both to the railways as well as bus services.

Tab. 2.2-3: Passenger transport in Azerbaijan

	1989	1991		1993		1995	
	'000 000	'000 000	% to '89	'000 000	% to '89	'000 000	% to '89
Rail	19.6	15.7	80.1	9.8	50.0	9.0	45.9
Bus	298.4	279.4	93.6	193.6	64.9	150.4	50.4
Air	2.2	2.0	90.9	1.5	68.2	...	

The data on bus traffic does include public transport in towns and cities, whose share was about 45 per cent in 1995. Unfortunately, there are no figures on private bus services for Azerbaijan either. In the state-run transport business, the number of passengers transported between 1989 to 1995 dropped by nearly a half. Considering the private bus services, it becomes clear that the decline in passenger transport on road is far less than with the railways.

In 1995, there were still 75 state-run companies in the bus transport sector of Azerbaijan. The fleet consisted of 3,728 vehicles with an average age of about 8 years. The vehicle stock is in an altogether bad technical condition.

The state bus companies offer connections on numerous routes both in long-haul and international traffic. In 1996 for instance, there was a daily service Baku-Tbilisi and five departures per day from Baku to Makhachkala (Dagestan). And there are a great many bus connections being offered by private Azerbaijan and, to a growing extent, also foreign companies.

In rail traffic, the number of passengers fell to 45.9 per cent from 1989 to 1995. The passenger transport performance was reduced to 38.7 per cent during the same period of time. There was a further sharp decrease in 1996, when the number of passengers dropped by another 50 per cent as compared to the previous year.

Tab. 2.2-4: Rail passenger traffic of Azerbaijan

	1989	1991	1993	1994	1995
Rail, total					
1,000	19,600	15,700	9,800	10,600	9,000
'000 000 pkm	2,042.9	1,975.2	1,395.8	1,111.9	791.2
Ø km	104	126	142	105	88
Regional traffic					
1,000	14,000	10,300	6,100	7,800	6,400
'000 000 pkm	177.0	181.8	171.3	170.1	140.2
Ø km	12.6	17.7	28.1	21.8	21.9
Long-haul traffic					
1,000	5,600	5,400	3,700	2,800	2,600
'000 000 pkm	1,865.9	1,793.4	1,224.5	941.8	651.0
Ø km	333	332	331	336	250

The number of passengers transported has declined more or less at the same rate in regional as well as long-haul traffic. Thus, the proportion of regional traffic in passengers transported remained more or less the same at approx. 71 per cent in 1995, as compared to 1989. The share of regional traffic in passenger transport performance rose from 8.7 per cent in 1989 to 17.7 per cent in 1995. This is due to the considerable shrinkage of the average transport distance in long-haul traffic from 333 km to 250 km.

The following table depicts passenger transport on selected main lines of the Azerbaijan Railways:

Tab. 2.2-5: Rail passenger transport on main lines in Azerbaijan

('000)

	1989	1994	1995
Baku - Tbilisi v.v.	525.6	160.6	22.0
Baku - Yalama v.v.	1,333.3	182.5	146.0
Baku - Nakhichevan v.v.	871.2	-	-
Baku - Astara v.v.	306.6	328.5	233.6

Due to the Nagorno-Karabakh conflict, operations were ceased on the line of Baku - Nakhichevan in March 1992.

Georgia

Georgia experienced the greatest drop in passenger transport among the three Caucasus republics. Both in the railway and the state bus services, the number of passengers transported as well as the transport performance fell to less than a quarter from 1989 to 1995.

Tab. 2.2-6: Passenger transport in Georgia

	1989	1991		1993		1995	
	'000 000	'000 000	% to '89	'000 000	% to '89	'000 000	% to '89
Rail	17.0	11.0	64.7	8.1	47.6	3.7	21.8
Bus	772.7	613.3	79.4	57.3	7.4	57.0	7.4
Air	2.7	2.4	88.9	0.6	22.2	...	...

The details on the bus services also contain the urban public transport. There are no official figures for private road transport for Georgia either. According to expert estimates, the share of the state sector in passenger transport was approx. 30 to 40 per cent in 1995.

In rail traffic, passenger transport dropped to 22 per cent from 1989 to 1995. In 1996, too, the downward trend continued. According to preliminary figures, the number of passengers transported fell by roughly another 10 per cent as compared to the previous year.

Tab. 2.2-7: Rail passenger traffic of Georgia

	1991	1992	1993	1994	1995
Rail, total					
1.000	11,041	7,632	8,070	9,762	3,676
'000 000 pkm	2,135	1,213	1,003	1,165	371
Ø km	193.4	173.4	131.0	120.5	101.4
Regional traffic					
1.000	6,219	4,654	5,642	8,449	3,010
'000 000 pkm	294.0	262.3	447.0	784.3	241.4
Ø km	47.3	56.4	79.2	92.8	80.2
Long-haul traffic					
1.000	4,822	2,978	2,428	1,313	666
'000 000 pkm	1,841	951	556	381	130
Ø km	382	319	229	290	195

The increase in the average transport distance in regional traffic and thus in its proportion of the total transport is obviously caused by the different allocation to the

individual traffic sectors. The share of international traffic in the number of passengers transported in long-haul traffic was 22 per cent in 1989 and went down to 2 per cent in 1995.

2.2.3 Assessment of main factors of influence

Some of the decisive factors of influence were already described in Points 2.1.2 - 2.1.4 on the freight traffic forecast, e.g. the political and macroeconomic situation and foreign trade. That is the reason why only those aspects shall be elaborated on in the following which have direct influence on passenger traffic demand as well as the development of the modal split.

2.2.3.1 Political situation

The great number of conflict points in the Caucasus region has also led to serious impediments of national and international passenger traffic in all three countries. International rail traffic is especially hard hit. Lines which were formerly of great significance for rail passenger traffic are now either interrupted or only to be used to a severely restricted extent.

For instance, the Baku - Yalama - (Makhachkala) line is only used very little for passenger traffic because of the tense situation in the Northern Caucasus (Chechnia, Dagestan). Nearly 50 per cent of the total international passenger traffic of the Azerbaijan Railways was conducted via this relation in 1989. Passenger traffic on this section had gone down to 11 per cent of the 1989 level by 1995 and afterwards the international traffic was suspended generally. In October 1996, the regular scheduled service on the Baku - Makhachkala line was to be resumed once more, but had to be cancelled again only a few days later.

The line of Tbilisi - Samtredia - Sukhumi - (Russia) which was important for international passenger traffic in the past is not serviceable at the moment due to the conflict of Abkhasia. The important connections of Baku - Nakhichevan - (Armenia) and Yerevan - Nakhichevan - (Azerbaijan) are also shut down because of the Nagorno-Karabakh conflict.

Thus, the prospects for domestic long-haul traffic and international traffic of the railways in all three countries will be decisively influenced by the further political development in the region. In the scenarios described under Point 2.2.4, assumptions are detailed as to the point in time of a possible resumption of international passenger traffic on the individual line sections.

2.2.3.2 Economic situation

The current economic situation in the three countries as well as possible scenarios for the further macroeconomic development for all three Caucasus republics have already been laid down in the section on the freight traffic forecast. Thus, the trough of the economic crisis connected with the transition to market economy structures has already been reached or overcome in all three countries. There is a moderate economic upswing with growth rates differentiated according to the respective country.

The macroeconomic development is of course closely linked to the factors of influence investigated in the following, such as the development of income, the rate of employment, individual car ownership.

And it is the degree of privatisation achieved so far which is of significance for the modal split in passenger traffic, as especially the road transport business is to undergo a transition to private economic structures. The three countries have meanwhile reached a different stage of privatisation. Armenia has progressed farthest, whereas in Azerbaijan the privatisation of small and medium-sized companies has just begun.

A privatisation of the state-owned railways is not planned in any of the three countries at the moment.

2.2.3.3 Development of income, rate of employment

The economic restructuring in the three countries has also led to dramatic changes in the development of the income, the structure of expenditure and thus in the cost of living for the population. The following table shows the development of prices for the period of 1990 to 1994 in Azerbaijan and Georgia:

Tab. 2.2-8: General retail price index (1990 = 1)

	1991	1992	1993	1994
Azerbaijan	2.1	20.9	257.1	4534.2
Georgia	1.75	15	478	28319

Also after inflation adjustment, there is a clear increase in the cost of living. The following example for Armenia shows that the real income has been drastically reduced over recent years:

Tab. 2.2-9: Money income of Armenia's population

	1990	1991	1992	1993	1994
disposable money income (in % comp. with previous year)	85.4	70.2	30.4	51.7	50.7

The situation in Azerbaijan and Georgia is similar.

The services sectors of the three countries are also hit by the increase in consumer prices.

2.2.3.4 Population

Population and population density figures are depicted in the following table:

Tab. 2.2-10: Population and population density (1994)

	Population ('000)	Population density (per km²)	Share of urban population (in %)
Armenia	3754	133.5	67,7
Azerbaijan	7487	86.0	53.0
Georgia	5430	77.9	55.7

More than 50 per cent of the total population in Azerbaijan and Georgia live in towns and cities, 23 per cent of the people inhabit in the country's capital respectively. The proportion of the urban population in Armenia is about 67 per cent, some 35 per cent of the people live in the capital city of Yerevan.

Population figures and territorial distribution are strongly influenced by migration processes in all three countries. As a consequence of political conflicts, there is a relatively high number of refugees, who are temporarily living in the capitals or other large cities. Especially economic problems but also the tense political situation have led to the fact that a great number of people are leaving the region.

2.2.3.5 Foreign trade

A detailed discussion of the foreign trade relations of the three countries can be found under Point 2.1.4 of the freight traffic forecast. It is especially the geographical structure of the foreign trade relations which is of relevance for the passenger traffic. Intensive mutual economic relations also lead to an increased business travel.

The relations between the three countries are of special significance for the rail traffic. Rail transport is less interesting for trips of business partners to other countries outside the region because of the great distances or difficult infrastructural conditions. The main means of transport for business trips from outside the region will be undoubtedly the aeroplane in future.

At the moment, the foreign trade relations within the region have not reached the level which would correspond with the potentials and possibilities of the countries. The causes are to be found first and foremost in the political tensions in the region but also in the yet not unfinished process of restructuring the economic and trade relations. Foreign trade relations among the three countries will intensify over the next few years.

2.2.3.6 Tourism

Tourism could become a growth potential for rail traffic in the region. However, the prospects are not very promising due to the political and economic relations in the short- and medium term.

The political tensions have caused tourist regions formerly significant for the populations of the three countries, for instance the Abkhasian Black Sea coast, Nagorno-Karabakh etc., to be rendered inaccessible. In addition, the infrastructure of the tourist sector has been badly affected by the military conflicts and the difficult economic situation in the countries.

Tourist traffic has decreased extremely as compared to the level of 1989 in all three countries. This is true for the following areas:

- the influx of foreign tourists, especially from the other CIS republics, has dropped to a minimum; trips to the three countries concentrate especially on the capital cities and less on the former traditional tourist resorts;

- holiday trips of the indigenous population within the own countries or the neighbouring countries more or less do not take place anymore; the main cause is above all the difficult economic situation, but also the political tensions in the region exert a negative influence;

Due to the new political framework, the relatively low number of trips abroad by the national populations are mostly undertaken to such countries, for which rail traffic is not interesting because of infrastructural conditions, distances or the costs involved (Iran, Turkey, Southern and Western Europe)

The steep decline in tourism is to be highlighted in the following with the help of Georgia as an example:

Tab. 2.2-11: Tourism in Georgia

(,000)

	1988	1989	1995
Tourists, total	1600	1005	252
including from			
Georgia	400	240	199
CIS	900	555	31
other countries	300	210	22

In future, the main means of transport for tourists will be the aeroplane. The railways will be used especially for trips within the region, e.g. to the tourist areas of the Black Sea coast. However, there is to be assumed a quickly growing significance of bus services, especially in the tourist sector. Already today, there are a great number of tourist offers by bus, which are conducted also covering extraordinarily large distances.

2.2.3.7 Individual car ownership

Armenia and Georgia belong to the republics of the former Soviet Union with the highest per capita car ownership, in Azerbaijan the stock of cars was under the Soviet Union's average.

Tab. 2.2-12: Car ownership

	1990		1995		1995/1990
	cars	per 1000 inhab.	cars	per 1000 inhab.	%
Armenia	240,800	67.4	256,700	71.8	106.6
Azerbaijan	246,000	34.2	392,165	52.4	159.4
Georgia	471,300	86.3	415,389	76.5	88.1

In comparison to Western Europe and also to other East European countries the level of individual car ownership is extremely low. The stock of private cars features a very high average age and is in a bad technical condition.
Based on the forecast economic development of the countries and the connected income situation of the population, only a slow increase in private car ownership is to be expected for the years to come. From 1990 to 1995, the stock of cars in Armenia only rose slightly (by 6.6 per cent) and in Georgia it even dropped (by 11.9 per cent). In Azerbaijan, the number of registered cars increased by nearly 60 per cent during the same period of time, but the car density of 52.4 vehicles per 1,000 inhabitants was still quite clearly below the level of the other two countries. Second-hand cars make up a relatively high proportion of imported cars at the moment.

2.2.4 Future traffic volumes

2.2.4.1 Total rail passenger transport

The individual factors of influence were first analysed and then their significance for the development of passenger volumes was assessed. A weighting of the individual elements was conducted, taking into consideration the respective specific factors in the individual countries.

The forecast of the volume in passenger traffic was based on the following general political and economic development in the region:

The internal political situation in all three countries will remain more or less stable over the next few years and will have a relatively insignificant influence on the number of passengers. The political situation in the region as a whole is of much greater importance, as this is what the development of international rail traffic but also national domestic long-haul traffic depend on. As regards the re-introduction of rail passenger traffic on the main lines, the two scenarios are based on the following development:

Relation	*optimistic*	*pessimistic*
re-introduction of passenger transport on the Tbilisi - Yerevan line	1998	2000
regular traffic Baku - Yalama - (Makhachkala/ Russia)	1997/98	2000
re-introduction of rail traffic via Nakhichevan	2000	2005
unimpeded rail traffic through Abkhasia	2000	2003

Armenia

The economic situation in the country will stabilise further. This will be reflected also in a gradually growing passenger volume. However, the individual modes of transport will participate to a differing degree in this growth. The proportion of road transport, both individual and public, will increase further. Whereas the number of people transported will grow in total, there will be a further decline in rail transport in 1997. Only as of 1998, the railways will register an increase in passengers whereas in the pessimistic scenario the year is 2000.

Following the concrete assessment and weighting of all factors of influence, there will be the following growth rates in passenger transport of the Armenian Railways (figures in per cent):

Tab. 2.2-13: Annual growth rates of rail passenger traffic in Armenia

	1997	1998-2000	2001-2005	2006-2010	2011-2015
Regional traffic					
optimistic	- 5.4	1.5 ... 2.2	1.8 ... 2.3	4.7 ... 5.0	4.8 ... 5.1
pessimistic	- 10.0	- 5.2 ...+0.8	0.8 ... 1.1	2.3 ... 2.6	2.5
Domestic traffic					
optimistic	0	4.8 ... 5.0	5.0 ... 7.5	4.6 ... 5.1	2.4
pessimistic	-5.0	0 ... 1.9	1.9 ... 2.2	2.0	0.7 ... 1.0
International traffic					
optimistic	-	5.3	9.5 ... 10.5	5.2	2.3 ... 2.7
pessimistic	-	-	5.0 ... 5.2	2.5 ... 2.8	2.3 ... 2.5

Following the start of the Yerevan - Tbilisi service as of 1998 (optimistic) or 2000 (pessimistic), international passenger rail traffic will develop moderately once more. As of the year 2000 (or 2005), there will be a further increase through the reinstatement of traffic to and through Nakhichevan.

As of 1997, the following average transportation distances are to be expected:

Regional traffic	40 km
Domestic traffic	210 km
International traffic	250 km

Thus, the following passenger volumes may be deduced for the Armenian Railways:

Tab. 2.2-14: Rail passenger traffic in Armenia up to the year 2015

(,000)

	1997	2000	2005	2010	2015
Passengers ('000)					
optimistic	1,796	1,975	2,224	2,532	2,801
pessimistic	1,701	1,665	1,785	2,013	2,122
Pkm ('000,000)					
optimistic	77.9	100.0	120.8	140.5	156.4
pessimistic	73.8	78.8	91.7	103.3	110.1

The number of passengers transported will be 94 per cent of the 1995 level in the year 2015 in the optimistic scenario and only 71 per cent in the pessimistic scenario. Detailed figures on the individual transport segments are to be found in Annex ... The share of regional traffic will continue to be over 90 per cent of the people transported, its proportion in transport performance will drop to 65 per cent by the year 2015.

Azerbaijan

In Azerbaijan, too, the modal split will continue to shift in favour of transport by road. The total traffic volume will continue to decrease until 1997 and only slightly rise as of 1998. In railway traffic, a growth in passengers transported may be reckoned with as of 1998 at the earliest (optimistic scenario), but an increase is more likely only after the year 2000.
The assessment of the individual factors of influence yields the following growth rates in the passenger traffic of the Azerbaijan Railways (in %):

Tab. 2.2.-15: Annual growth rates of rail passenger traffic in Azerbaijan

	1997	1998-2000	2001-2005	2006-2010	2011-2015
Regional traffic					
optimistic	-5.2	2.5 ... 5.0	4.8 ... 5.3	5.0	2.7
pessimistic	-25.0	-4.5 ... -5.0	0 ... 2.5	2.5 ... 2.7	1.0
Domestic traffic					
optimistic	-4.8	2.5 ... 5.0	9.5	4.6 ... 5.2	2.3 ... 2.7
pessimistic	-10.0	-2.8 ... 0.5	0 ... 5.6	2.6	1.0
International traffic					
optimistic	0	9.6 ... 10.2	14.5 ...15.4	9.4 ... 10.1	7.0 ... 7.5
pessimistic	0	4.5 ... 5.0	4.9 ... 5.5	4.5 ... 5.2	4.0 ... 4.8

In 1996, too, there was a significant reduction in the transport volumes of railway passenger traffic, amounting to some 50 per cent as compared to the previous year. This downward trend will continue also in 1997. Regional traffic is affected most severely by the reduction in passenger numbers. The share of this segment in the total number of passengers will go down to 57 per cent by 2015.

A growth in international traffic may be expected as of 1989 (optimistic scenario) or 2000 (pessimistic) with the normalisation of traffic on the Baku - Yalama - Russia line. A further increase will take place as of 2000 (optimistic) or 2005 (pessimistic) with the re-instatement of services to and through Nakhichevan. The start of operations on this line will also lead to a significant increase in domestic traffic.

As of 1997 the following average transport distances are expected:

Regional Traffic	25 km
Domestic Traffic	250 km
International traffic	295 km

This results in the following passenger traffic volume for the Azerbaijan Railways:

Tab. 2.2-16: Rail passenger traffic in Azerbaijan up to the year 2015

(,000)

	1997	2000	2005	2010	2015
Passengers ('000)					
optimistic	4,333	5,205	7,316	9,396	10,717
pessimistic	3,644	3,292	3,928	4,457	4,709
Pkm ('000,000)					
optimistic	426.8	563.3	889.9	1,153.1	1,330.0
pessimistic	392.9	380.6	518.9	590.9	628.6

The detailed figures on the individual transport segments are contained in Annex ...

The number of people transported in the optimistic version will rise to 119 per cent of the 1995 level by the year 2015, and in the pessimistic scenario the level is a mere 52 per cent of the 1995 figure. These large differences between the two scenarios result above all from the assumed repeated serious drop in the period of 1997/98 in the pessimistic scenario and the much later opening of important lines in long-haul traffic.

Georgia

In Georgia, the volume of the overall passenger traffic has risen since 1995 once more. However, the railways cannot profit from this yet, even in 1997. Thus, in Georgia, too, there will be a further increase in the proportion of road transport.

After the assessment and weighting of the individual factors of influence according to the specific conditions of the country, the following growth rates result for rail passenger transport in Georgia (in %):

Tab. 2.2-17: Annual growth rates of rail passenger traffic in Georgia

	1997	1998-2000	2001-2005	2006-2010	2011-2015
Regional traffic					
optimistic	0	0.8 ... 3.0	3.2 ... 3.6	2.0 ... 2.5	2.2 ... 2.4
pessimistic	-5	-5.5 ... -2.3	0 ... 2.3	1.8 ... 2.0	1.5 ... 2.3
Domestic traffic					
optimistic	0	4.5 ... 5.3	4.8 ... 5.5	7.0 ... 7.5	5.0 ... 5.4
pessimistic	-2.6	-2.5 ... 0	2.4 ... 2.8	4.8 ... 5.0	2.1 ... 2.6
International traffic					
optimistic	2.5	7.1 ... 7.5	5.0 ... 5.3	9.5 ... 10.5	4.8 ... 5.0
pessimistic	0	0	2.1 ... 2.6	4.5 ... 5.3	1.8 ... 2.4

Impulses for an increase in the volume of Georgia's railway passenger transport will emanate from the re-instatement of services to and through Abkhasia. This applies both to the domestic long-haul as well as international traffic. A further increase of traffic will be linked with the start of traffic to Armenia.

The following average transport distances are assumed for the Georgian Railways as of 1997:

Regional traffic	45 km
Domestic traffic	185 km
International traffic*	75 / 210 km

* 210 km as of 2000/2003 (opt./pess.) with re-instatement of traffic through Abkhasia

As a result, passenger volume and passenger transport performance of the Georgian Railways will develop as follows until 2015:

Tab. 2.2-18: Rail passenger traffic in Georgia up to the year 2015

(,000)

	1997	2000	2005	2010	2015
Passengers ('000)					
optimistic	3,218	3,632	4,417	5,700	6,920
pessimistic	3,094	2,907	3,595	4,260	4,773
Pkm ('000,000)					
optimistic	348.4	412.4	516.5	715.6	897.3
pessimistic	337.7	320.5	449.1	550.1	620.2

In the optimistic scenario, the number of people transported will rise to 188 per cent of the 1995 level by the year 2015, and only to 130 per cent in the pessimistic version. These relatively high growth rates, compared with the other two countries, result, above all, from the comparatively low starting level in 1995, only 33 per cent of the 1991 level (Azerbaijan stood at 57 per cent and Armenia at 66 per cent).

In Georgia, the share of regional passenger transport will drop from 82 per cent in 1995 to 41 per cent in 2015 (optimistic scenario).

In order to check the forecast results achieved as to their plausibility, they were compared with the current situation in other European countries. Greece and Turkey suggested themselves as comparison, as their railway passenger traffic features a comparable initial situation. Both countries have a similar density of railway network as the three Caucasus republics. The degree of private car ownership is also comparable.

	Network density (km / 1,000 km^2)	Car ownership (cars / 1,000 inhab.)	Mobility (trips per year)
Turkey	10.8	43	2.2
Greece	18.8	178	1.2
Armenia	12.1	72	0.7
Azerbaijan	24.1	52	1.4
Georgia	52.7	77	1.3

The figures on network density and car ownership relate to 1995, mobility means trips by railway per inhabitant, for Greece / Turkey 1994, for the Caucasus republics in 2015 (opt. scenario).

According to these figures, the three Caucasus republics will reach a similar level as regards the use of the railways for passenger traffic by the year 2015, as it currently prevails in Greece and Turkey.

2.2.4.2 Passenger transport in main railway corridors

The selection of the traffic relations, for which the passenger volumes are to be forecast, was based above all on the significance of the respective line sections for international traffic. The following relations were included in the assessment:

- Baku - Tbilisi
- Baku - Yalama - (Makhachkala)
- Baku - Nakhichevan - Yerevan
- Baku - Astara
- Tbilisi - Yerevan
- Tbilisi - Samtredia - Sukhumi - (Russia)

The forecast of the passenger volume related to the respective relation is difficult in so far as, except for the lines of Baku - Tbilisi and Baku - Astara, there is no scheduled passenger traffic at the moment. Thus, the identification of a realistic starting level is extremely complicated. In the following, the approach is explained in detail for each individual corridor.

Baku - Tbilisi

Over the past years, one international passenger train operated in each direction per day. The traffic volume has been decreasing steadily since 1989. The following passenger numbers were transported in the Baku - Tbilisi direction:

1989	262,000
1994	80,300
1995	10,950
1996	1,500

It is assumed that traffic on this line will be stabilised approximately at the level of 1995 as of the year 1998. The further development will then take place in line with the rates of increase established for international rail traffic (compare Point 2.2.4.1). Thus, the following volume results for international passenger traffic on the Baku - Tbilisi v.v. line:

('000 passengers)

Baku - Tbilisi v.v.	1998	2000	2005	2010	2015
Optimistic scenario	22	27	54	86	124
Pessimistic scenario	17	19	24	31	39

Based on the transport volume of 1995 and the rates of increase as laid down in Point 2.2.4.1, the volume of domestic long-haul traffic was established additionally for the relation Baku - Gyandsha v.v.:

('000 passengers)

Baku - Gyandsha	1995	1997	2000	2005	2010	2015
Optimistic scenario	803	465	526	847	1,081	1,223
Pessimistic scenario	803	441	419	509	576	606

Baku - Yalama - (Makhachkala/Russia)

In the past, this line was among the most important connections of the Azerbaijan Railways in international passenger traffic. The following number of passengers were transported in the relation of Baku - Yalama:

1989	666,650
1994	91,250
1995	73,000

The figures for 1989 include international traffic. As of 1994, the figures only relate to the passengers transported in domestic traffic. International traffic via Yalama to Russia was ceased due to the tense political situation. Already in 1996, traffic between Baku and Makhachkala was to have been re-introduced again. Now it is assumed that this connection will be operated regularly as of 1998 (opt.) or 2000 (pess.). The predicted number of passengers in international traffic is 40,000 in the year of resuming operations. Thus, there would be the following passenger volumes for this section:

('000 passengers)

Baku - Yalama	1995	1997	2000	2005	2010	2015
Optimistic scenario						
Domestic long-haul	146	85	96	154	197	222
International traffic	-	-	48	97	157	225
Pessimistic scenario						
Domestic traffic	146	80	76	93	105	110
International traffic	-	-	40	51	65	83

Baku - Nakhichevan - Yerevan

Due to the conflict around Nagorno-Karabakh, railway operations were ceased on this line in March 1992. In the year 1989, some 525,600 passengers were transported between Baku and Nakhichevan, and the figure was 345,600 for the relation of Baku and Yerevan. The optimistic scenario assumes the resumption of traffic in the year 2000 (pessimistic scenario - 2005).

The following passenger volume is predicted for the time of resuming operations:

Domestic long-haul traffic	200,000
International traffic	30,000

The passenger numbers assumed for the domestic long-haul traffic more or less correspond with the level of the entire domestic long-haul traffic in the year 2000, as compared to 1989.

Using the development rates detailed in Point 2.2.4.1, the following passenger numbers result for the Baku - Nakhichevan corridor:

('000 passengers)

Baku - Nakhichevan	1995	1997	2000	2005	2010	2015
Optimistic scenario	-	-	230	260	332	375
Pessimistic scenario	-	-	-	230	260	273

Baku - Astara

The passenger volume was established for this relation, based on the actual level in 1995, using the development rates for domestic long-haul traffic:

('000 passengers)

Baku - Astara	1995	1997	2000	2005	2010	2015
Optimistic scenario	234	136	171	275	351	397
Pessimistic scenario	234	128	122	170	192	202

Tbilisi - Yerevan

Railway passenger transport was ceased on this line in May 1995. The reasons were the severely decreased passenger numbers as well as the unstable security conditions along the line.

It is assumed that traffic between the two capital cities will be resumed again in 1998 (opt.) or 2000 (pess.). The assumed passenger volume on re-introducing services is 30,000. On the basis of the rates of increase for international traffic (Point 2.2.4.1), the following development is predicted:

('000 passengers)

Tbilisi - Yerevan	1995	1997	2000	2005	2010	2015
Optimistic scenario	0	-	33	42	61	77
Pessimistic scenario	0	-	30	36	45	50

Tbilisi - Sukhumi - (Russia)

In the past, this line was of special importance both for national as well as international passenger traffic. In connection with the conflict around Abkhasia, railway services were ceased completely. In predicting the future passenger volume on this line, it was assumed that regular railway traffic to and through Abkhasia will be resumed in the year 2000 (opt.) or 2003 (pess.).

The assumed starting numbers on resuming traffic are 130,000 passengers in domestic long-haul traffic (that corresponds with the level of traffic on the Tbilisi - Poti line in 1996/97) and 40,000 passengers in international traffic. Thus the following development of passenger traffic results up to the year 2015:

('000 passengers)

Tbilisi - Sukhumi	1995	1997	2000	2005	2010	2015
Optimistic scenario	0	0	170	217	320	409
Pessimistic scenario	0	0	0	209	261	295

Tbilisi - Samtredia - Poti / Batumi

These connections are also of significance for the tourist traffic and as a link to the two important port towns of Poti and Batumi. Unfortunately, there is no concrete statistical data available on the current passenger traffic on these lines. Thus the prediction was based on our own calculations, using the seat capacity being offered on these lines and the average passenger numbers carried on the trains (details provided by the Georgian Railways). The following passenger volumes result for 1995:

Tbilisi - Batumi v.v.	220,300
Tbilisi - Poti v.v.	130,800

Using the established growth rates for domestic long-haul traffic in Georgia, the passenger volume will develop as follows up to the year 2015:

('000 passengers)

Tbilisi - Poti	1995	1997	2000	2005	2010	2015
Optimistic scenario	131	131	152	194	278	355
Pessimistic scenario	131	126	120	174	217	246

Tbilisi - Batumi	1995	1997	2000	2005	2010	2015
Optimistic scenario	221	221	256	327	470	600
Pessimistic scenario	221	213	203	295	367	415

3 Business strategy of infrastructure

3.1 Legal and institutional framework for joint ventures

3.1.1 Laws and drafts of laws

Laws and drafts of laws of the 3 Caucasian states which are relevant for the activities of enterprises in general and of railways in particular:

Legislation in the Republic of Armenia

- Law on enterprises and entrepreneurial activities, dated 14.03.1992,
- Regulation on foreign trade activity, dated 13.02.1993,
- Law on foreign investments, dated 31.07.1994,
- Law on privatisation and denationalisation, dated 20.03.1996
- Draft of a transport law (1996),
- Draft of a railway law (1996),
- Draft of a Civil Code (in preparation).

The common law of Armenia is to be applied in the scope of industrial safety and work place safety, the environmental care, the liability, the insurances, the taxes and duties, and the border controls.
The staff of the ARM is subject to the general legislation for the employees of the state. The FSU Civil Code is still applied.

Legislation in the Republic of Azerbaijan

- Law about entrepreneurial activities, dated 15.02.1992,
- Law about property in the Republic of Azerbaijan,
- Law on the protection of foreign investments, dated 15.01.92
- Law about privatisation of state property, dated 07.01.1993,
- Law about enterprises, dated 01.07.1994,
- Law about Joint stock company, dated 12.07.1994,
- Law on state registration of legal entities, dated 06.02.96,
- Draft of a transport law (1996).

Legislation in the Republic of Georgia

- Railway Law (1994),
- Law on Entrepreneurs (1996),
- Law on promotion and guarantees of investment activity (amended in 1996),
- Draft of Civil Code (in preparation).

The common law is applied on railway activities in Azerbaijan and Georgia as in Armenia.

3.1.2 Foundation of affiliated companies

In the 3 states the railway enterprises founded affiliated enterprises in the legal form of private enterprises, but up to now in peripheral areas of the railway only (e.g. schools, social services), and not in the core of their activities. However, it must be examined to what extent the legislation hinders or excludes to separate areas or activities from the infrastructure, and to introduce them in a Railway Infrastructure Authority, or to make them to objects of a Joint Venture. In the case of activities as the purchase or the production of materials, the maintenance of the track system or the signalling or the telecommunication systems, the separation should be permissible. The investigation if the railway lines in their entirety may be separated, must be deepened. At present, amendments to the legislation seem imperative.

3.1.3 Cooperation

Regarding the Armenian legislation, the possibility for the ARM to be a partner of a Railway Infrastructure Authority is limited. The area of the competence of such a body ought to be concretely defined. Further investigations are necessary.

The laws about enterprises and about the Joint stock company enable the establishment of companies as legal persons authorised to manage the state property. Hitherto, AGZD has founded numerous affiliated companies, all alone, e.i. without partners. The participation of foreign enterprises in such companies is not excluded. For certain activities a license is demanded according to the special legislation of Azerbaijan. The property used by AGZD, by the Caspian Shipping Company or by their branches, subsidiary and affiliated companies belongs to the state. It is not allowed to contribute it to an enterprise, because the privatisation of railway assets is excluded. A solution of this problem is to be investigated.

Hitherto, the law about entrepreneurs was not yet applied to the GRZD though it admits the foundation of affiliated companies as legal persons. Partners of such enterprises may be foreign enterprises or investors. In the legal form of a Limited Liability Company or a Stock Company these enterprises or joint ventures may have property of their own. Even railway assets are not excluded as property of them. The establishment of a Railway Infrastructure Authority is possible from the point of view of the Georgian legislation. In certain cases (e.g. telecommunication) a license is essential.

3.2 Joint Venture scenarios in infrastructure fields and evaluation

3.2.1 Introduction

The evaluation of various management and ownership strategies (in short: strategies) as an essential basement for service companies foundation needs a methodological frame which can be used for such tasks irrespectively of a project.

For this reason, this methodology can demonstrate only the most important criteria and evaluation items, e. i. completion , extensions or reductions are possible and necessary depending on type, extent and specificity of projects.

3.2.2 Methodology

The following policy is to be held while selecting and classifying strategies:

3.2.2.1 Preliminary selection of potential scenarios

Within the framework of preliminary selection, potential scenarios and directions for foundation and operating of joint venture(s) in the infrastructure and transport field (service company (s)) are to be selected, for which this methodology can be applied in detail.
Criteria for the selection are:

- economic development (development of industries, branches and foreign trade)
- relevant operation or transport and economic marking values data, for example, expected turnover or traffic flows (see traffic volume forecast)
- technological and technical developments which accelerate or essentially bear the above-mentioned criteria as basic value (for instance, telecommunication).
- other national and international interests like, f. e. strategic connection between industrial and trade centres.

Wording of these scenarios is done verbally . Depending on type and wording of scenario, objective directions are set in the next step.

This step has particular significance, as total expenses can be reduced due to a substantially proven and purposeful description of scenarios.

3.2.2.2 Setting of objective directions

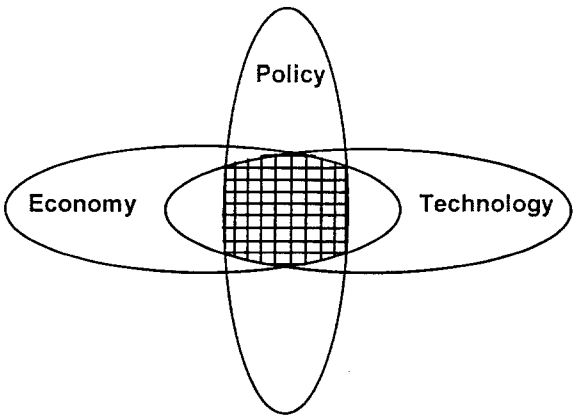
The foundation and operating of joint venture(s) in the field of infrastructure and transport (service company(s)) takes place through various objective settings for participants. Recording, classifying and evaluation of these objectives is a task for the 2nd step.

The following main directions of objectives are to be distinguished

- political (domestic / foreign, national / international)
- economical (national economy / business management)
- technological (production, transport, communication)
- other (other verbal objectives).

These objective directions can be subdivided in turn according to demand, so that it is possible to make a detailed description of various objectives and to differentiate target values.
Individual objective directions must be scaled considering their relevance for attaining of general objective.
The intersection of separate objective directions is of particular importance for the foundation and location of respective enterprise.

Fig. 3.2-1: Main points of the objective directions analysis



It is necessary to distinguish objectives, which must be attained (must-objectives) and which can be attained (can-objectives).

Not attainable must-objectives are K.o.- criteria for a strategy starting point or for a partial strategy.

Can-objectives should be evaluated depending on their type and extent. A table of the defined objectives can have the following look:

Tab. 3.2-1: Overview of objective directions per participants

No.	Objectives	Objective	Rail-way	...	...	...	...	...
1	Linkage to line X	P	K	M				K
2	...	P			M			
3	...	W	K	K				K
4	...	T		M		M		
5	...	W			K			
6	...	P		M				M

P - political objective
W - economic objective
T - technological objective

K - can-objective
M - must-objective

By early setting of the objective directions, it is possible to detect in time mutual objectives and conflict of aims among the participants.

3.2.2.3 Analysis of real possibilities and conditions

On the basis of the objective directions and derived separate objectives, the present scenarios are investigated for the purpose of their real feasibility based on the given possibilities and conditions including results of the previously carried researches.

This analysis forms the basis for comparison of actual state with the set objective directions and the following derivation of partial strategies. The analysing groups are structured by analogy with the objective directions.

As an example of partial analysis preparing, the investigation of possible enterprise forms for joint venture(s) in the field of infrastructure and transport (service company(s)), which are shown in the Annex 3.2-1., can be referred to.

On the grounds of legal / juridical, economic, finance and technical basis, one could define main points in detail, which were shown in the partial strategy "Enterprise form".

3.2.2.4 Differentiation of partial strategies

Comparing objective directions and real possibilities and conditions, one can derive statements on the separate partial strategies.

The term "partial strategy" includes determination of all business decisions, which are necessary for foundation and operation of a joint venture(s) in the field of infrastructure and transport (service company(s)). Hereto belong besides others:

- business objectives,
- enterprise form
- participants
- financing
- business tasks
- organisation.

One should give a priority treatment to the partial strategies, which cover the given must-objectives.

Owing to primary setting of must-objectives of partial strategies, one should be able to work out complex strategy starting points for a selected scenario without delay. Separate partial strategies should be estimated by their participants inclusively basing on their significance. This will help to define priorities. (Annex 3.2-2 should be compared)

3.2.2.5 Creation of general strategy and consistency /plausibility testing

On the basis of the elaborated partial strategies, general strategy is derived and consistency and plausibility are tested.

Consistency and plausibility testing always takes place among the partial strategies. Connections between the separate partial strategies are to be found in the annex 3.2-3.

Depending on the extent of the general strategy specificity, its introduction time schedule has to be worked out .

3.2.2.6 Evaluation system

The evaluation of separate partial strategies occurs iteratively, e. i. every component's feasibility and plausibility is already investigated and evaluated within the frames of partial strategy during the stage of elaborating. The consistency and plausibility testing within the general strategy includes also a permanent starting points evaluation comparing with the worked out objective directions.

3.2.2.7 Partial strategies and total strategy selection

The partial strategies and therewith a total strategy selection should take place within the framework of a so called guiding committee. This committee should consist of experts from special fields and means of conveyance respectively, as well as of representatives of respective countries-participants decision-making bodies.

Within presentations held by an independent expert, the partial strategies should be presented and explained.
The person responsible for presentation should not in any way be involved or participate in the enterprise to be founded.
The guiding committee can also arrange the verifying of partial strategies under ecological aspects as well as on national specificity within the framework of selection procedure.

Besides of the selection of strategies, the most important task of the guiding committee is preparing, control and accomplishment of the strategies. For this purpose, the members of the guiding committee have to draw up specific plans for accomplishment possibilities of the selected strategies

4 Trans-Caucasian Railway Operating Centre

The project schedule shows that most of the investigations with respect to work stream 3000 are subsequent to the works regarding work streams 1000 and 2000, or are based on the results of the respective work packages. So in the Interim Report only first, partial results can be given as to WS 3000.

4.1 Legal and Institutional Framework

4.1.1 Establishment of Railway Operating Centres

According to the legislation of the 3 states, international companies/joint ventures may be founded as enterprises of private law by railways, shipping companies, port administrations, and foreign investors.

The legal basis for such a formation may be:

- either an international treaty between the partner states: in this case the approval (the ratification) by the parliaments of the partner states is required; the statute of the enterprise is to be laid down in the treaty;

- or, in compliance with the national legislation of one of the partner states about the foundation of enterprises; in this case the rules to be applied for the activities result immediately from the law on enterprises of the state in which the company /joint venture is founded.

The choice of any national legislation and of any legal form depends mainly on:

- the aims of the company/joint venture and of the activities passed to it,
- the extent of the participation of railways as partners (majority or minority),
- the general conditions regarding investments, profits, taxes, financing etc.,
- the possibility to hire staff outside the railway administrations.

These questions are to be examined for every project.

For the foundation of a Railway Service Centre, the application of the Georgian legislation should have priority because it has the highest degree of flexibility (see 1.2.2: Analysis of the present organisation).

4.1.2 Cooperation, international agreements

With regard to these points, reference is made to the comments on the Railway Infrastructure Authority (see 1.2.2.).

4.1.3 Legal requirements for the activities of the Service Centre

The result of the entrepreneurial legislation is to be applied. According to the desired aims the requirements must be examined for every project. The following cases may be taken in account:

1. No special licence is required when the company/joint venture has to buy, to produce or to build only, e.g. materials for the tracks, for pipelines, for telecommunication; to produce concrete sleepers, or to repair the rolling stock.

2. Forwarding enterprises which have to buy railway, ferryboats, shipping or handling services for their customers, do not require a special official approval, neither.

3. Enterprises which have to provide telecommunication services, must apply for an exemption or licence in all 3 states, because telecommunication is a state monopoly.

4. When the operating company/the joint venture shall work in the seaports, contracts are to be made with the port administrations, the railways and the maritime companies resp. ferryboats. The rules of the FSU are no longer applicable to the seaports in Azerbaijan and Georgia. New legal regulations to replace them have not yet been developed. Therefore, that must be defined in the contracts. The context of these contracts depends on the scope of the activities of the company in relation to the area of the responsibilities of the port administrations.

Hitherto, the following contractual regulations have been concluded:

1. node agreement dated 14.4.1995 between AGZD, Baku Seaport, the Caspian Shipping Company, and the Customs Committee of the Azerbaijan Republic;
2. node agreement between AGZD and Baku International Seaport, valid since 1.1.1996;
3. node agreement between the station Batumi of the GRZD and the seaport of Batumi dated 7.3.1997;
4. node agreement between the station Poti of the GRZD and the seaport of Poti dated March 1997.

In the regulations reference is made to the

- Rules for carriage of export-import goods, following via seaports and frontier stations in non-direct international traffic, approved on 22.1.1991,
- Rules for freight carriages in direct combined railway-water traffic,
- Rules for freight carriages in direct multimodal railway-water traffic.

The statute of the Caspian Shipping Company has been settled by regulation of the Republic of Azerbaijan dated 6.10.1993.
The Armenian Ministry of Transport endeavours to lease real estates with rail sidings and ship joining in the seaport of Batumi which are property of the Republic of Georgia. It is intended to run international freight trains directly between Armenian railway stations and these sidings in the seaport of Batumi.

When the operating company/joint venture has to render railway transport services, it must be distinguished juridically between the following cases:

1. When the company uses wagons which are not railway-owned (see Annex 10 to SMGS), then not the company is a railway entrepreneur but the state railways, on whose lines transports are realised.

2. When the company uses wagons and locomotives of its own (or hired or leased rolling stock), then the company is a railway enterprise which produces railway services on a foreign infrastructure. In this case it has to conclude a contract with the state railways which grants the right to use the infrastructures against payment. In this case an amendment to the transport law would be necessary in every Caucasian state.

3. When the company operates the railway jointly with the respective state railway, then both enterprises are juridical railway entrepreneurs. It is a matter of an "operator community". In the legislation of the 3 states provision is not made of this case. An amendment would be required. Between the operating company and the state railway(s) a society contract must be concluded. The rights and the obligations of the partners are to be settled in this contract

4.1.4. Activities of an operating company

The legal relations between the company and its customers are based on the civil law, if it is a forwarder like actually the company "Azjel-dor-ekspeditzija" of the AGZD, or the Tariff and Forwarding Division in the HQs of the GRZD.

"Civil law" means: the civil code of the FSU. New laws of the 3 Caucasian states are in preparation but not yet in force.

Is the company juridical a railway enterprise, then it is bound to the railway transport legislation and conventions valid in the respective state.

For inland transports, the respective legal transport system is applied. The ministries of transport are authorised to approve or to reject tariff petitions by the company.

For international transports, the convention SMGS, the tariff MTT and the Enforcement Regulations of OSShD are valid. The risk is small that a ministry imposes a tariff condition on the company in this case.

The international ferry transports between Turkmenistan and Azerbaijan are incorporated into the regulations for the international railway traffic according to the treaties dated 13.5.1996. The FSU rules concerning the transition transports between rail and ferry have been abandoned in the Caucasian ports. In the interim, these questions must be regulated by contracts (see 4.2.3).

These varying regulations challenge to further development of a legal basis for the relations between an operating company/joint venture on the one hand and state railways, seaports, shipping companies and other means of transport on the other hand. Legal rules on the relations between the transport enterprises and the customers - as in national and international rail transports - should be created.

When the operating company/joint venture will be founded on the basis of an international treaty (see 1.2.1), the partner states may grant a lot of special rights (e.g. monopoly positions, exemptions from taxes, duties, customs or border controls) to the company.

In case the company will be established in compliance with a national law (see 1.2.2), then it is subject to the national legislation in every respect (e.g. anti-monopoly law, law on competition). It must enter into competition with other enterprises.

It may be assumed that the 3 Caucasian governments will not grant any special rights to the company/joint venture that surpass the determinations fixed in the treaties on the corridor transports dated 13.5.1996. They are:

- in the treaty coordinating the activities in the rail transport:
  free transport of goods (para.2),
  licences for transport and forwarding services (para.5), and
  priority in the ferryboat transport (para.6).
- in the agreement regulating the transit transports:
  free transit, and
  exemption from transit fees.

4.2 Tariffs, User Charges and Revenues

4.2.1 The transport market

The TRACECA corridor is not the only available transport corridor from Europe to Central Asia (Uzbekistan and Turkmenistan). Table 4.2-1 lists the main corridors which are available for transport of goods. For the convenience of comparison with the TRACECA corridor, Baku has been selected as target city.

Tab. 4.2-1: Main Transport Corridors Europe - Central Asia

No	Transport Corridor	Transport Mode	No. of Trans-shipments	Length (km)	Time (days)	Cost (US$/ton)	Price
1	Europe						
	St. Petersburg	Ship	1	1,700	4	17	140
	Baku	Ship		4,800	25	42	(minim. 1000 t)
2	Europe						
	Kazakhstan	Rail		3,100		52	
	Turkmenbashi	Rail		2,400	20	38	
	Baku	Ferry	0	280	3	6	230
3	Europe						
	Mersin	Ship	1	7,000	25	70	
	Baku	Truck		2,000	10	54	300
4	Europe						
	Bandar Abbas	Ship	1	10,900	30	100	
	Baku	Truck		2200	10	60	340

Existing Links

The data in the table have been compiled using

- information form shipping companies
- ESCAP (United Nations) maps on inter-regional links with Asia and
- Turkmenbashi Port Development, Phase 1, Draft final report

The last source was used mainly for the cost column.

The first link is mainly used for inner-Russian transports. It uses the canal system in Russia to get to the Caspian Sea. The second link is the traditional railway line to Kazakhstan. The third link passes through a well-served port in the South of Turkey with an eventual truck distance. The fourth link uses the well-served Iranian port of Bandar Abbas.

It is obvious that two railway links with Russia are very viable competing links at least for the transport to the Caucasian republics: Moscow-Sotchi and Moscow-Grosny (Chechnya). If and when they are reopened they will have rather the same advantages/disadvantages as the railway link via Kazakhstan.

Tariffs

These transport corridors do exist but there are very few forwarders who exploit them for traffic to the Central Asian countries.

In the Turkmenbashi Port Development Study it has been tried to calculate the transport charges based on idealistic transport charges without considering the structure of forwarders available and the risks.

While this is a perfectly valid method for comparing the transport links, it is necessary for a short-term analysis to estimate real transportation charges. Most of the shipping companies contacted did only cover part of the links. From their partial quotations it can be estimated that the real transportation charge is 2.5 to 3 in comparison to the costs calculated. This is the main reason for differences between costs and actual charge. For the railway corridor the actual offer was taken. It should be handled with care, as it seems to be a short run introductory offer.

Other Aspects

The shortest travel time is used by the railway link where no water transport is involved. The longest travel time is obviously needed going by Bandar Abbas.

The Russian canal link has got severe problems. It is not viable during 5 months of the year. Also only whole ships can be chartered.

The other links are feasible especially to compete with the TRACECA corridor for transit traffic to Central Asia. As it is practically impossible to determine any market share of Europe Central-Asia traffic that could be captured by using the pricing policy of the logistic train, these links cannot be regarded with further detail in the course of this study.

4.2.2 Transport modes in the TRACECA corridor

There are two basic transport modes in the TRACECA corridor: Road and Rail. While in the former Soviet Union there was a natural preference for rail transport. Due to its inherent efficiency, the road has gained important market shares under the condition of strongly decreasing transport volumes.

The technical situation is characterised by a deteriorating infrastructure for both modes. While the railway is in need of maintenance work as proven by various studies in this programme, the road is also only hardly maintained.

As far as the organisational situation of both modes is concerned there exist significant differences: the railways in Georgia and Azerbaijan are state-owned entities that are under relatively direct supervision of the corresponding ministries.

The road transport sector has developed into a peculiar form of organisation. It seems that the truck pools of the former truck holding companies are hired out to individual drivers which pay flat and/or business dependent rates. While the drivers are entrepreneurs, they may have middlemen who receive the transportation charges and pay the drivers according to the days worked. Due to these hardly transparent situation the costing of transport has been undertaken by using net driver salaries without entrepreneurial overheads.

Before it is possible to analyse the TRACECA corridor it is necessary to see first the various access/outlet routes leading to the Georgian side of the corridor from Western Europe.

Access Routes

Tab. 4.2-2: Access/Outlet Routes for the TRACECA Corridor

No	Access Route	Transport Mode	No. of Trans-shipments	Length (km)	Time (days)	Charge
1	Road via East Adriatic states and Turkey	Road	0	4300	14	6,000 US$ p. truckload
2	Ship via North Sea / Atlantic port	Ship Ship	1	8000	24	2,000 US$/ 20' Cont.
3	Road via Italy / Ferry to Greece/ Road	Road Ferry Road	0	5500 (5300)	10	6,400 US$ p. truckload
4	Road via Eastern Europe Ferry	Road Ferry Road	0	3400 (2200)	...	...
5	Road /Adriatic Port / Ship	Road / Ship	1	5400	19	2,800 US$ 20' Cont.
6	Rail /Adriatic Port / Ship	Rail / Ship	1	5400	20	2,400 US$ 20' Cont.

Table 4.2-2 gives a survey of key data of the access/outlet routes for the TRACECA corridor. It becomes obvious that there is not just one TRACECA corridor from Europe to Central Asia. It also becomes clear that a number of transport routes are competing in the transport service market. This will be more interesting in the medium run as country specific regulations will be set up that might favour or discourage the use of certain access routes.

The first access route is still the most popular for general cargo of medium to high value. It can be assumed that it will regain substantial market shares with the continuing normalisation in the former Yugoslavian states.

The shipping route via the North Sea and Mediterranean Sea can be undertaken from any seaport of the mentioned coast. Due to the reduced traffic volumes there are as yet no direct shipping lines. Freight has to be feedered by smaller ships. The feeding takes place in Southern Italy.

The road link via Italy was a natural route when Yugoslavia was closed for transit. It has the additional advantage of presenting fewer borders. This translates among others to a clear reduction in travel time.

The road link via Black Sea ports in Eastern Europe does exist as there is a RoRo ship connection between Varna and Poti. In the courses of interview no shipper could be identified who uses the route.

The road/rail connection via the Adriatic ports is mainly used for limited traffic volumes directed to Southern Europe. It is, however, an interesting transport mode especially with a view to strengthen the rail transport in the TRACECA corridor.

It goes without saying that any road transport on the access routes will not tranship the load onto rail for further transportation. Thus those access routes which arrive at Georgian ports should be strengthened.

The column on transhipments reflects only the transhipments *within* the access route. For all waterbound transport modes there is an additional transhipment in Georgian ports (except for the planned rail ferry).

The length is a rough indication of the distance and was calculated based on shippers interviews and United Nations ESCAP maps. As a point of reference Frankfurt was used as origin in Western Europe.

The transit times are based mainly on shippers' and forwarders' information. As said before, no such information could be given for the Eastern Europe link (No. 4).

There is no cost column as the above-mentioned source of this information did not calculate these values for most of the routes.

The price (= transportation charges) column give forwarders' estimates for goods that are typical for the transport mode and the link. In the analysis below they will be made more comparable.

The transportation charges mentioned in the last column of Table 4.2-2 for the waterborne transports are limited up to a Black Sea port. The costs of the TRACECA corridor have to be added. The costs for trucks are specified up to a point around Tbilisi. Thus roughly 75 per cent of the price of transportation in the corridor have to be added to become comparable with the competing corridors in Table 4.2-1.

Other Aspects

In spite of the considerable price it seems that the truck link is by far preferred for general cargo which is valuable (spirits, computers etc.) It can therefore not be expected that these cargoes might be shipped via sea/rail.

The differences in travel time do not seem to be of much concern to the customers /shippers as long as the goods arrive. All the time won by a fast road haulage can be lost in customs.

The main problem in access to the TRACECA corridor by water is the low level of activity in the port of Poti. The need to feed cargo as there are no direct links between Western Europe and Poti/Batumi increases the price by about 300 US$ per 20' container.

Medium-term Development

According to the forecasts it can be expected that in the medium run the water transport to Poti will become much more attractive, as the amount of goods will increase strongly. The same is said about the other end of the corridor Baku port. With the further normalization of political conditions and the increase in cargo it can be expected that the port cargo handling will be further professionalised. This will give the water/rail combined traffic more chances in comparison with truck traffic.

It is, however, to be expected that the infrastructure development will follow the international developments. Thus the road sector will be much more supported by infrastructure development than the railways. In the medium run this will have an influence on rail transport prices.

4.2.3 Transportation charges and cost situation in the TRACECA corridor

4.2.3.1 Rail

Containers

As known, the product is in its introductory phase and operates as a "pilot train" between Poti and Baku once a week. In order to start up the project a tariff was needed. After careful analysis of the tariffs existing for rail transport, the TRACECA project team proposed an introductory tariff which was agreed upon on 17th October 1996 between the Azerbaijan and Georgian Railways.

Tab. 4.2-3: Port processing costs of 20' containers in Poti port

Category	20' Container loaded (US$)	20' Container empty (US$)
Handling	65	33
Document processing	110	110
Other (storage fees)	15	15

It must be stated that the rail tariff is not the exact fee as the document states a large number of charges. The above table is just to give a survey of present transportation charges.

An approximation for a typical transportation charge can be given in the following list. It refers to a container transport from Poti to Baku. In order to compare with road transport at a later stage, it is assumed that the container is delivered to a customer in the Baku area. In both cases the price includes the empty return of the container back to Poti. As a matter of convenience the prices of the railway transport are rounded.

Tab. 4.2-4: Estimate of total transport charges for a 20' container

Category	Price US$ per 20' container
Transport	470
Handling	100
Document processing	110
Other	30
Delivery and Collect.	150
Forwarder's charge approx. (5 per cent)	50
Total:	**910**

It is proposed that the pilot train as well as the final product in future will not only transport containers but also general cargo. The transport charges for general cargo are not uniform.

At present (and it is also expected for the medium future) the tariffs are applied to special types of goods. While there are relatively few categories in Georgia, there are many different prices in Azerbaijan. The following Table 4.2-5 presents a survey of key data.

Tab. 4.2-5: Selected transport charges in Georgia and Azerbaijan

Price of 1 ton (50 tons for 100 km), in Swiss Francs		
	Georgia	Azerbaijan
General import/ transit goods	4.83	
General local goods	3.86	
Metals		4.64
Industrial goods local		4.64
Oil (local)		5.19

General Cargo

In Azerbaijan some transport charges for exports are well below the local charges. This is demonstrated by the prices for the transport of one ton of goods for the 535 km between Baku and Beyuk Kyassik (border with Georgia).

Tab. 4.2-6: Selected export / transit charges for Azerbaijan

Price of 1 ton (50 tons for 535 km), in Swiss Francs	
	Azerbaijan
Oil	10.45
Metals	13.20
Industrial goods	29

This means that bulk cargo is benefiting from considerable "discounts" while high value general cargo will be penalised.

As the product will transport high value general cargo there would be the following transport charges for the TRACECA corridor.

Tab. 4.2-7: Costs of 1 ton of general cargo in the TRACECA corridor

Price of 1 ton (50 tons for 535 km in Azerbaijan, and 360 km in Georgia)		
	Swiss Francs	US$ (rounded)
Azerbaijan	29	22
Georgia	15.68	12

The total of 34 US$/ton or 3.7 US cent/tkm is nearly equal to the one-way charge of a container with a 10 ton content for the pilot train. The container transport charge is, however, rebated by 50 per cent compared to the normal tariffs which are shown here. Thus it becomes clear that the price for container transport is considerably higher than that for general goods.

Cost Situation

Markets normally do not accept cost prices. Prices have to be derived from competition of products. Therefore, the setting of cost plus prices tends to fail to include the market signals.

It is, however, important to know the variable costs of the services to be delivered, as this is the basis for the lowest possible price a competitor can fix.

It is rather difficult to calculate variable costs for the railways, as neither of the railway departments have their cost structured according to fixed and variable costs. As a first approach, the total cost can be taken.

The total unit cost for the railways in 1995 have been estimated during the first phase of this project. The following tables summarise the results (compare also chapter 1.2.3).

Tab. 4.2-8: Calculation of total unit cost of Georgian Railways

Item	Unit	
Total cost of freight transport	1000 US$	21,153
Transport volume	mil. tkm	1,246
Costs per tkm	US cent tkm	1.7
Container factor		1.8
Costs of container transport per tkm	US cent tkm	3

Tab. 4.2-9: Calculation of total unit cost of Azerbaijan Railways

Item	Unit	
Total cost of freight transport	1000 US$	35,891
Transport volume	mil. tkm	2,409
Costs per tkm	US cent tkm	1.0
Container factor		1.8
Costs of container transport per tkm	US cent tkm	1.8

The factor to cover for increased costs of container transport of 1.8 has been estimated.

By using the values calculated above the total costs of transportation of 1 container in the TRACECA corridor can be estimated:

Tab. 4.2-10: Calculation of total cost for transporting 1 Container in the TRACECA corridor

Item	Unit	
Costs of container transport per container/km Georgia	US cent tkm	30
Kilometres in Georgia	km	360
Total cost for Georgia:	US$ (rounded)	110
Costs of container transport per container/km Azerbaijan	US cent /tkm	18
Kilometres in Azerbaijan	km	535
Total cost for Azerbaijan:	US$ (rounded)	100
Transport costs	US$ (rounded)	210
add 50 per cent for empty return of container	US$ (rounded)	105
Total transport cost:	US$ (rounded)	315

As mentioned before the cost figure of 315 US$ refers to total costs. As most of the costs indicated are fixed costs the variable costs is much below this value.

As an indication of the variable costs the following table indicates the costs for energy and personnel for a train based on data of the railway department in Azerbaijan.

Tab. 4.2-11: Indication of variable costs of container transports

Item	Unit	
Total kilometres of a return trip Baku - Poti - Baku	km (rounded)	2,000
Total hours of a return trip incl. safety margin	hours	70
Driver costs per hour	US$	0.55
Assistant costs per hour	US$	0.35
Guard costs per hour	US$	0.27
No. of guards		2
Personnel costs of a train = hourly costs * hours	US$	100
Average no. of containers transported (loaded and empty)	No.	20
Personal costs per container	US$	5
Gross weight of loaded container incl. wagon	t	35
Gross weight of empty container incl. wagon	t	25
Energy consumption	kWh /tkm	0.025
Price of one kWh	US cent	4.5
Total tkm to be transported (50 per cent loaded, 50 per cent empty)	tkm	60,000
Energy costs = tkm * spec. consumption * price	US$ rounded)	70

The figures show that the costs for energy and personnel amount to approximately 70 US$. On the one hand, the personnel costs on the Georgian side are lower than the assumed Azerbaijan costs. On the other hand, there is obviously some "variable wear and tear" on rolling stock and track.

Consequently, it can be stated that the variable costs of the transportation of one container are in a range between 70 and 300 US$. This has to be compared with the actual transportation charge of 470 US$.

Thus even with the actual rather low transport charge the railway departments of Azerbaijan and Georgia are contributing to the coverage of fixed costs, and they could even lower that price if the competition would require such an action. This is however not to be expected in the near future. This statement is based on the analysis of the road transport.

4.2.3.2 Road

Transportation charges

In chapter 4.2.3 some indications on transport charges for the access routes were given. Now, the question of transport charges for the corridor has to be answered. As was mentioned, the organisation of the transport sector was subject to a profound change. There are few companies with a fleet of trucks. Instead there are individual truck drivers who deal directly with customers, but have to hire out trucks from the old truck owning companies. There are rather few other trucks in any of the countries except those that were available before the political changes. The organisational framework leads to the fact that there are no fixed tariffs for transport of goods in the corridor.

There is, however, a system of "informal tariffs" among the truck drivers and it is reported that these "tariffs" are sometimes enforced by illegal means.

It is evident that transport charges are "truck-orientated". There is no possibility of calculating ton-kilometres as there is normally one load only which has to feed the owner/driver. Thus there cannot be much difference between prices for container transport and general cargo, as the transportation charge is for a truck load.

A truck load corresponds to one 20' container, or 15 tons of general cargo (or less).

In addition to the informal truck charges there are the forwarding fees.

The main forwarders in Georgia and Azerbaijan have indicated transport charges as in the following table:

Tab. 4.2-12: Truck transport charges in the TRACECA corridor

Category	Charge US$
Transportation Poti - Baku or vice versa	1,400 to 1,600
Other costs	200 - 600
Total:	1,800 to 2,100

This price for a container corresponds to 120 - 140 US$ per kg of general cargo.

In international comparison this price is rather high.

Cost situation

As with rail transport firstly the total costs of road transport are calculated. Secondly the variable costs as lower limit of competitive pricing has to be focused. The data have been gathered based on interviews with truck drivers and forwarders.

Tab. 4.2-13: Truck transport costs in the TRACECA corridor: Fixed costs (US$)

Annual fixed costs (US$)			
Truck 5 Years		Usage Years	Amount
incl. saddle	22,000	7	3,143
Tax			500
Garage			360
Repair			5,000
Total			9,003
Per km running	40,000	km /Year	0.23

The above table presents fixed costs of a typical truck for container or general cargo transport. The investment costs are rather low as until now there are almost no new trucks in the country. In the calculation it is assumed that most of the repair costs are due to age and not to wear and tear. Other assumptions would not strongly change the results of the eventual analysis.

A rather decisive variable are the kilometres per year. The value given is very low in international comparison and reflects the low average overall speed of the trucks as well as limited volumes in the transport market.

As with all fixed cost distributions, the amount per kilometre is artificial and must not influence economic decisions.

Tab. 4.2-14: Truck transport costs in the TRACECA corridor: variable vehicle costs (US$)

Tyres Number Price Total tyre costs per km running	 14 140 1,960 60,000 km	 0.03
Diesel	50 litres / 100 km / 0,3 US$/litre	0.15
Oil	4 litre / 1000 km / 1 US$/litre	0.004
Total:		**0.22**

The next table indicates the variable vehicle running costs without driver. The major share of fuel costs in this category corresponds roughly to international data. The outstanding fact is the low tyre consumption, which is only possible by sacrificing security requirements. An update has not been made, as this practice is common among truck drivers and will possibly not change in the medium run.

Tab. 4.2-15: Truck transport costs in the TRACECA corridor: variable road costs / driver (US$)

Road Usage Fees	km	US$
Poti - Tbilisi	350	0
Poti - Baku	1000	450
Tbilisi - Baku	650	200
Poti - Yerevan	300	250
Other Costs		
Poti - Tbilisi		50
Poti - Baku		300
Tbilisi - Baku		250
Poti - Yerevan		100
Drivers		
Poti - Tbilisi		50
Poti - Baku		300
Tbilisi - Baku		250
Poti - Yerevan		100
Variable Road /Driver Costs; Total		
Poti - Tbilisi		100
Poti - Baku		1050
Tbilisi - Baku		700
Poti - Yerevan		450

The next table shows the variable cost elements of road and driver costs. The road costs depend on legal and other regulations. Due to the dramatic financial situation of the states in the corridor it is hardly to be expected that the level of charges will be reduced.

As far as the "drivers salary" is concerned, only artificial values could be estimated. The reason is that the drivers do not properly know their net remuneration. According to the interviews conducted it seems that the drivers encash the total transport fee (minus the forwarders charge) and pay variable costs and hire charges for "their" trucks.

Tab. 4.2-16: Truck transport costs in the TRACECA corridor: variable costs (US$)

Variable Vehicle Costs per section			
Poti - Tbilisi	700 km	0.19	131
Poti - Baku	2000 km	0.19	373
Tbilisi - Baku	1300 km	0.19	243
Poti - Yerevan	600 km	0.19	112
Total Variable Vehicle Costs			
Poti - Tbilisi			231
Poti - Baku			1,423
Tbilisi - Baku			943
Poti - Yerevan			562

The next table gives the results of the calculations with regard to different sections in the corridor. The most important figure is the value of about US$ 1,400 for the whole corridor. This figure can be compared to the variable costs of rail transport which were estimated above to 100 to 300 US$.

Tab. 4.2-17: Truck transport costs in the TRACECA corridor: total costs (US$)

Total "Fixed Costs"			
Poti - Tbilisi	700 km	0,23	158
Poti - Baku	2000 km	0,23	450
Tbilisi - Baku	1300 km	0,23	293
Poti - Yerevan	600 km	0,23	135
Total Costs			
Poti - Tbilisi			388
Poti - Baku			1.873
Tbilisi - Baku			1.235
Poti - Yerevan			697

It is interesting to see the total costs of road transportation in the corridor. As they do not include the forwarders fee, it can be stated that the actual transportation charges in the corridor are below the actual costs.

The only element of the variable costs that can be squeezed is the drivers net income. Therefore it is a matter of fact that the actual net earnings of the drivers are considerably lower than the values given. This would reduce the actual variable costs but they would still remain above the US$ 1000 level. As far as fixed costs are concerned, it is not necessary in the short run to care about depreciation. This will however be changed when the present truck fleet will be replaced and cash money is needed.

In any case it remains a fact that road transport cannot compete in terms of price with rail transport. This applies also in the medium run.

4.2.4 The demand situation

It is evident that the marketing strategy and especially the pricing in a market depends heavily on demand. Pricing is one of the main elements to capture an increasing market share in the market for transport services to Central Asia. There is, however, a considerable lack of data on the total volume of demand for transport services to countries in Central Asia, out of which the product (logistic train) could derive its market share.

Demand figures for containerised transport in the TRACECA corridor are available. For the complete transport volume study, please see chapter 2.1. They are reviewed here to enable a fast orientation.

4.2.4.1 Goods structure and volumes

The following table gives a survey of the forecast on railway transport in the corridor.

Tab. 4.2-18: Key Data of Transport Forecasts

	2000 (optimistic scenario)			2010 (optimistic scenario)		
in TEU	Baku Poti	Poti Baku	Poti Armenia	Baku Poti	Poti Baku	Poti Armenia
Container traffic by rail (rounded)						
upper limit	6,000	4,000	4,000	13,600	8,500	9,100
lower limit	3,800	2,200	2,700	7,400	3,900	3,600
Compare: Baku Port Forecast (containerised traffic in '000 tons)**		350			680	

* without Poti - Tbilisi / Tbilisi - Poti

** HPTI, Tacis Port Baku, Phase 1, Draft Final

This forecast is based on railway shares between 30 and 75 per cent. These shares might be realistic for the longer distance transports. In each case marketing activities

should be concentrated on these longer distances. Therefore the forecast for Poti - Tbilisi and v.v. have not been mentioned.

The data can be converted to a traffic volume of 6,000 to 10,000 containers per year for the railway by the year 2000. This means a frequency between 4 times a week and a daily service by assuming 50 per cent capacity utilisation. As the frequency of the service is a clear marketing tool, there should be a clear policy that frequency comes before capacity utilisation.

The forecast for Baku port is obviously far more optimistic with regard to containerised traffic. If the forecast for that port becomes a reality (ferry and port), a multiple of these containers would be shipped by the other transport mode in the corridor: road.

Even if these forecasts do not materialise it becomes evident that there is sufficient market for the product. It is thus important for the product to obtain a considerable market share by using the proper marketing mix.

4.2.4.2 Customers attitudes

One of the main problems in demand of transport services with regard to rail are customers attitudes. Customers are producers of goods, but in most cases the real customers are the shipping companies as they bear the responsibility to deliver the transport service with regard to producer and buyer.

Due to its monopolistic past the railway has not shown commitment to its customer. This is a fact which not only relates to Eastern railways.

The prevailing customer attitude towards railways can be drastically described as fear and desperation. Only bulk producers with little choice are deliberately choosing railway.

This decisive characteristic of demand the logistic train can hardly be overcome by pricing policy only.

4.2.4.3 Medium-term development

The medium-term development in the demand of transport services in the TRACECA corridor will definitely grow strongly. Besides the transit traffic Azerbaijan imports are one of the main sources for growing transport flows. It is certain that the oil production will create demand for transport services in various ways.

The logistic train can gain its market share out of this demand if several factors as described below are well managed.

4.2.5 Tariffs

4.2.5.1 Existing railway tariffs

The tariff to be used must comply with some basic requirements. It must:

(1) correspond to laws and regulations in the countries concerned;
(2) be easy to read and interpret;
(3) allow flexibility with respect to the customers' requirements;
(4) allow flexibility in dealing with competitors.

The present tariff in the TRACECA countries is still based on the MTT (Meshduna-rodnyi Transitnyi Tarif). It was introduced for the railways of the socialist countries to enable uniform traffic conditions and transport charges.

The basic characteristics of this tariff are:

- railway distance related;
- different categories of goods;
- degression depending on quantity and distance;
- unit of calculation: Swiss Franc;
- special tariffs for containers.

Today the tariff fees are differing in the TRACECA countries. Recently there has been a meeting of the Railways of the CIS states to work on a new tariff system.

Among the principles that already have been agreed upon are:

- common regulations among CIS states with a yearly conference for review;
- common tariff base;
- regulation of maximum tariff charges;
- possibility that national railways reduce the charges for their section;
- currency: Swiss Francs or US$;
- flexible tariff system that enables reactions to other transport tariffs;
- the governments should encourage international transport by reducing tariffs and investing in international railway links.

This tariff shall be elaborated within the next two years (until 1998).

These principles do not consider developments that might apply to the logistic train, i.e. the railways offer infrastructure to a private company to operate based on own rolling stock and own tariff. At present it is assumed that the regulations will be created between TRACECA countries in the process of EC co-operation projects.

4.2.5.2 Tariff recommendation

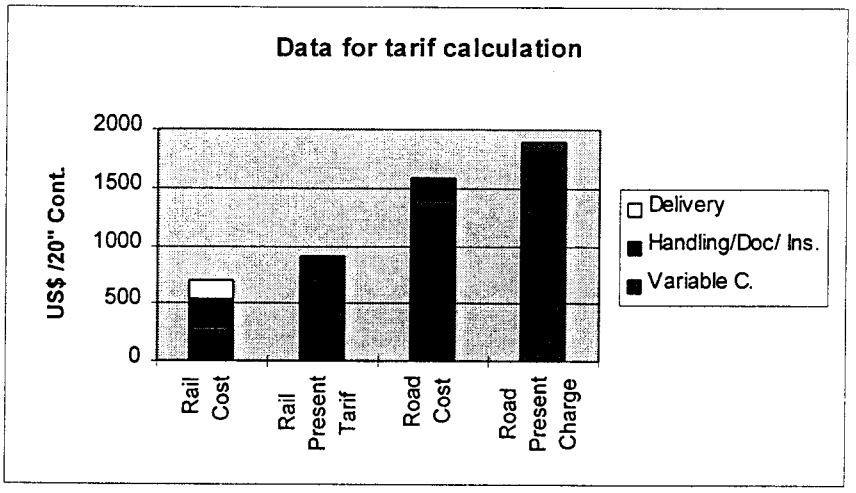
Base data

The following table and figure indicate the base data for the tariff consideration. They are based on a 20' container.

Tab. 4.2.-19: Base data for tariff consideration

Item (in US$)	Variable Costs	Handling/Doc/ Ins.	Delivery
Rail costs	300	240	150
Present rail tariff	910		
Road costs	1400	180	0
Present road charge	1900		

Fig. 4.2-1: Data for tariff calculation



The table is based on the following:

- as far as costs are concerned, the 'variable costs' form the bottom line of price setting.;
- Handling /Documents/ Insurance is cheaper for road transport, as handling costs are lower for trucks;
- delivery costs by road as 'variable costs' for truck/kilometres have been considered to be marginal.

Unit transportation charges

By analysing the data it becomes evident that the variable costs, i.e. the bottom line of road transportation, are considerably higher than those of rail transport. Even the present transportation charges for the pilot train are still far below the variable costs of road transport.

This means first and foremost that *a sound product that satisfies the consumers can bear much higher prices than those actually charged.*

It must be reiterated, however, that the product must meet the customers' expectations, and in cases even surpass them.

It is apparent that rail transport still must remain cheaper than road haulage:

- a container or any goods on the truck have their personalised guard;
- fewer persons are involved in the transport;
- by definition, there are always two transhipments more involved than in rail transport;
- the danger of breakage and delay is greater than with rail transport;
- with road haulage, shippers are dealing with smaller entities that can be better negotiated with than an enormous organisation like a railway department.

What is the price that has to be matched? It seems that no truck could regularly run for less than US$ 1,900. This corresponds roughly to the actual costs. Forwarders have only one possibility to reduce the price: by reducing the net salary of the drivers. This cannot be done for long and this would result in the drivers sparing themselves repairs and, in consequence, frequent breakdowns.

How much cheaper? It seems that 10 per cent is too little as it might not really be accepted as a reduction. So the approach would be to settle for 20 per cent. For simplicity the resulting amount should be rounded.

This means that the base price for the tariff setting would be US$ 1,500 for a 20' container transport through the TRACECA corridor with the empty container returned to the port of origin.

As far as 40' container are concerned, it is not possible to introduce a surcharge of, say, 50 per cent. The reason is that the truck haulage costs are about the same for both types of containers. Thus only a surcharge of 200 US$ should be tested. It has to be reiterated that these charges are not cost- but market-related!

For palletised general cargo it should be chosen a simple relation to 20' containers. If one ton would be taken as one 15^{th} of a container, the charge would come up to 100 US$ for the Poti- Baku section. This includes unloading as well as FOT delivery and

transportation in the special logistic train. Of course a minimum transportation weight should be set (10 to 20 tons) and some restrictions placed on goods with low specific weight. (The stipulations of the existing tariff could be used).

The following tariff principles are proposed:

- no goods differentiation (except the usual limitations like explosives, etc.);
- other transport relations are priced according to distance. As flat rates are needed, the distances also should be flattened. The following distance values are proposed (in km):

Poti - Baku	950
Poti - Tbilisi	350
Poti - Yerevan	450

This applies to pure transportation charge and not to the other costs (handling, delivery, etc.)

The base transport charge for a 20' container amounts to 1,100 US$ (rounded), and 1200 US$ for 40' containers.

- flat rates;
- door-to-door transport in the corridor is included, and rebates are given to shippers with own delivery trucks.

These principles convert to the following list of transport charges:

Tab. 4.2-20: Transportation charges for the logistic train (in US$)

	Poti - Baku	Poti - Tbilisi	Poti - Yerevan
20' Container	1,500	800	920
40' Container	1,700	950	1,070
1 ton of general cargo	100	75	80

Considerations on the variation of charges

Some reduction should be given: If the number of containers amounts to an acceptable train load (i.e. 30 to 40 containers) there should be a reduction of at least 20 per cent. The shippers, however, will automatically reclaim this reduction.

It is not to be expected that loads of more than 60 to 70 containers of one shipper will ever be transported, as in that case water transport to Baku or Turkmenbashi will become more attractive.

A variation of the tariff system could be considered in which the base prices are lifted by about another 20 per cent, and the average transport charges are all given a 20 per cent discount with the exception of those months where truck haulage is difficult due to climatic conditions. Such a system, however, is not liked by most of the forwarders interviewed. Still, this does not mean that they would not accept the system *if the product delivers.*

Medium term strategy

The steps to implement the tariff should be carefully planned.

It may then take 6 to 12 months to proof the stability of the product using the present introductory tariffs.

Only after that period the above transportation charges should be introduced.

Obviously, the joint venture must constantly control the market development. The indicated prices have to be (and can be) lowered when the following developments take place:

- considerable increase in truck speed by improving roads and frontier dispatching which will enable better truck usage;
- considerable savings in road charges for trucks;
- opening of efficiently working rail links to Europe.

Even if the product keeps all the promises made it will be nearly impossible to compete with truly efficient rail links via Sotchi and/or Chechnya. Even the Kazakhstan link is cheaper than the TRACECA corridor. (It is however not known if the charges of the Kazakhstan link will really be kept at their low level if more goods are being shipped.) All these links are administered by Russian railways in connection with other state railways, and are thus burdened with all problems that these links face as far as the administrative side and the political stability is concerned. If those problems can be overcome, in the eyes of the potential customers the water transport link of the TRACECA corridor access must become considerably cheaper to the combined transport modes to compete successfully.

4.3 Objectives and strategy of Operating Companies

The developed methodology forms the basis for work packages 2310, 3320, 3330, 4310, 4320 and 4330 investigation and elaboration.

Work package 4300 becomes an integral part of work package 3300, as it proved impractical to treat the ferry operations independent of the other means of transport.

The investigation of potential scenarios for the possible creation of joint venture(s), which are envisaged within the framework of this project for one or more service companies is based on the results of the project "Pre-investment Study and Pilot Train Baku - Tbilisi - Poti/Batumi", the traffic forecast of this project, and the local experiences gained by discussions with local decision-makers and potential participants in service companies.

Here the investigation of main relations is of special significance. The relations mentioned in chapter 4.2 from a historical point of view play the decisive role.

On the investigated relations there is not one supplier who would offer to freight traffic customers the organisation and co-ordination of goods transport and their eventual haulage by various means of transport.

Since customers have different contact persons and are confronted with varying conditions (for example, tariffs), the time and costs they must invest in the present situation prove to be excessive as compared with the customers' actual objective: the secure and economical transportation of their goods by only one partner.

Being well aware of this situation, both transport customers and the individual state and private transport enterprises have a general interest in the foundation of service companies, but the individual interests differ a lot.

5 Port and ferry services

5.1 Introduction

The TOR request the Consultant to note and comment upon the capacities and complementary ferry services and the ports of Batumi, Poti, Baku, Aktau, Krasnovodsk (Turkmenbashi), Trabzon or ancillary road services that could affect the performance of the railway.

In line with this requirement and in correspondence with the technical proposal the

- port conditions and services,
- technical and operational requirements and
- port development options and strategy

will be dealt with. Main objective of this part of the Study is to find out whether the ports can duly fulfil their transit function, viz. act as reliable link between sea and inland transport, to identify any existing bottlenecks and constraints on the present and future port performance with possible impeding repercussions on the performance of the railway corridor and to outline proposals for future port development so as to safeguard the functioning of the railway corridor and the prompt dispatch of wagons and trains in future.

In order to make maximum use of the time allocated to the a. m. sub-tasks and of the information already available from other studies the critical assessment including physical inspection of facilities is focused on the ports of Baku, Poti and Batumi as most important ports of the railway corridor. The study of the other ports will be limited to a broad review of existing port information's and development plans as far as obtainable within the Draft Final Report.

The identification of the port related technical and operational requirements and definition of necessary port capacities and level of service expected in future largely depend on the traffic forecast including modal split analysis and container forecast (Task 2100). As the results of this study were not known till the end of the first mission of the ports specialist, the assessment of future requirements must be left to the second assignment phase in February 1997.

To avoid duplication of information on port capacities and ferry transport capacities, e. g. on the assignment of cargo to the individual berths, berth throughput and storage capacities, expected utilisation of capacities, data on **existing** port capacities will be dealt with in context with the assessment of **future potential** port capacities and ferry transport capacities as part of the Draft Final Report. In general terms and based on the standards of the FSU the ports demonstrated their high capacity in the years 1990 - 1992, when cargo throughput was x-times higher than in 1996 as the base year.

It appears that - apart from an obvious back-log in re-investments and overhaul of facilities - existing port infrastructure and superstructure do not represent any significant bottleneck against the revitalisation and commercialisation of railway transport through the envisaged establishment of the joint venture. However, the port services offered will be studied not only in quantitative terms, i. e. whether the physical port capacity is sufficient to cope with future transport demand, but also qualitatively, that means whether the ports can offer an adequate level of services to secure existing railway traffic and attract additional cargo.

As the joint venture for the Caucasian railways is in focus of the study, road transport related questions will be considered only with regard to possible repercussions from a possible modal shift on the dispatch of railway wagons within the ports.

The title of this study and the TOR imply already that most of the governing problems are not technical or operational problems, but managerial ones.

In view of the fact that substantial portions of potential corridor traffic are generated at the ports the identification of existing problems and constraints should not be limited to the dispatch of train-ferries, container and RoRo vessels but also to the discharging and loading of conventional dry bulk, liquid bulk and general cargo, so as to come up to a comprehensive basis for the proposal of development objectives and the identification of future port related requirements relevant to the railway corridor.

As said before, many of the problems and objectives are well known already to the various clients in charge from earlier even more detailed studies or parallel ongoing studies. It appears therefore sufficient to focus on the most important ones to enable a concise overview.

5.2 Present conditions in the port of Baku

5.2.1 Location and nautical conditions

The Port of Baku is situated at the SW part of the Caspian Sea on the coast of Baku bay. The position of the commercial harbour is Lat. 40° 22' N and Long. 49° 53' E.

The Apsheron Oil Terminal (4th Harbour District) is situated some 40 km ENE from the city on the Apsheron Peninsula. E of the commercial harbour there is a number of private berths for oil products and dry bulk cargoes (e. g. for the cement industry). A large privately operated off-shore supply base mainly used for the oil industry is located at Karadak some 60 km SSW from the city.

There is an easy access to the commercial harbour from the approach buoy, which is located some 3 nautical miles (nm) SW of Nargin Island. A fairway with traffic separation leads into the Bay of Baku. This outer approach channel has a length of

about 6 nm that leads to the inner approach of the various facilities. The inner approach to the dry cargo terminal has a length of about 2.5 nm and a width between 100 and 150 m. The channels are marked by light buoys to ensure day and night navigation.

The channels have to be dredged regularly. Maximum permissible drafts are as follows:

- for dry and general cargo vessels 4.5 m
- for ferries 5.6 m
- for tankers 8.0 m

Vessels trading on the Caspian Sea are restricted to a maximum width of 18 m and - during canal passage - to a maximum draft of 4 m governed by the dimensions of the locks of the Volga-Don-Canal.

There are no adverse weather conditions affecting the operation and thus capacity of the Port, although during January and February stronger winds from SW to SE with heavier seas occur that need to be observed during manoeuvring of vessels and staying alongside.

Pilotage is compulsory for foreign vessels only. The use of tugs is in the discretion of the Harbour Master and the pilots.

5.2.2 Port infrastructure, superstructure and equipment

Annex 5.2-1 gives an overview over the location of the individual port facilities, whereas Annex 5.2-2 shows the layout of the dry cargo and the ferry terminal.

In Table 5.2-1 the main important data of the existing berths are listed. The Timber Terminal (Berths 14 - 16) had to be abandoned in 1995 due to an excessively high water level (rise of about 2 m over the past 20 years), which has also impact on the two shore ramps for dispatch of the railway ferries at berths 12 and 13 as these work in their utmost upper position. Apart from the overflooding of the Timber Terminal berth No. 14 with a total length of 105 m built in 1960 is completely damaged and thus not operational. In addition to the oil berths at the Apsheron Oil Terminal listed there is one service jetty for marine craft. Two further jetties Nos. 2 and 5 with one berth on either side were demolished recently.

The entrance and exit gate for the dry cargo terminal is located at the end of Prospekt Neftyanik, where all trucks are cleared from Customs. Dedicated areas for the checking and waiting of trucks are not available. However, as traffic density is low, the gate is not congested even during usual peak hours in the morning and in the evening.

Tab. 5.2-1: Physical characteristics of the commercial port of Baku

Berth Nos.	1 - 3	4 - 6	7	8 - 10	11	12 + 13	14 - 16	Oil 1A/B & 3A/B
Location	Sea Station	Dry Cargo Terminal	Dry Cargo Terminal	Dry Cargo Terminal	Near Ferry Terminal	Ferry Terminal	Timber Terminal	Oil Terminal
Assigned Cargo in 1990	Passenger vessels	General cargo, containers and dry bulk cargo	Bulk cargo	Break bulk & unitised cargo; RoRo	Water	Railway Ferries	Logs, timber, iron & steel products, bulk cargo	Crude oil and oil products
Assigned Cargo in 1996	Passenger vessels	General cargo, containers and dry bulk cargo	Bulk cargo	Break bulk & unitised cargo; *No. 10 under reconstruction*	Water	Railway and RoRo Ferries	None	Crude oil and oil products
Approx. Design Depth	6.50 m	7.25 m	7.25 m	5.00 m	6.00	6.00 m	6.00 m	9.00
Approx. Quay Length	2 x 130 m = 260 m + 200 m	400.00 m	200.00 m	360.00 m	70.00 m	2 x 150.00 m	350.00 m	4 x 200.00 m
Approx. Quay Width	16.00/45.00 m	20.00 m	15.00 m	15.00 m	walkway only	15.00 m	15.00 m	20.00/40.00 m
Construction Year	1969	1939/1969	1939/1969	1939/1982	1967	1963	1960/71/82	1970
Substructure Construction	Concrete piles	Block wall / sheet piling	Block wall / sheet piling	Block wall / sheet piling	Steel pipe jetty	Steel sheet piling	Sheet piles and concrete piles	Concrete piles
Superstructure Construction	Concrete deck	Concrete deck	Concrete deck	Concrete deck	5 RC blocks	Concrete deck	Topping beams and RC platform	Concrete deck
Cargo Handling Facilities	Passenger terminal	Shore cranes and open storage	Shore cranes and open storage	Shore cranes, transit sheds and open storage	Pipeline and shore tanks	Spec. adjustable shore ramp for railwagons and vehicles at each berth	Shore cranes, transit sheds and open storage	Pipelines and shore tanks (ab. 140,000 t for crude oil and 180,000 t for oil products)
Access	Road	Rail and road	Road	Rail and road	Road	Rail and road	Rail and road	Road

Source: Baku International Seaport
Baku Port Master Plan, Phase I Report 10/96, HPTI
Consultant's Observation

Road access to the ferry terminal is via a 6 m wide and about 550 m long road from the Prospekt Nobelya. Neither the access road nor the ferry terminal was designed for heavy-duty road traffic. Moreover, the terminal was planned for inland transport only, but not for transit/cross border traffic. Consequently this change in modal split and in dispatch procedures has led to a heavy congestion of the whole terminal area.

Both, the dry cargo terminal and the ferry terminal have direct access to the railway station by means of a single line with out-of-level crossings at the main roads. Total rail length on the dry cargo terminal is about 4.5 km and at the ferry terminal some 8.0 km.

The dry cargo terminal occupies in total about 18 hectares. There are 5 sheds are available with a total floor area of about 9,500 m^2 and 4 open storage areas with some 45,000 m^2.

Total area of the ferry terminal is about 8 hectares. Due to the existing built-up of neighbouring areas there is virtually no room for terminal expansion. The adjacent areas are private property (e. g. Caspian Shipping Line and one former concrete factory) and are not used with relevance to the ferry terminal.

In Table 5.2-2 the main characteristics of the existing port equipment are listed. In addition there is a number of floating equipment such as harbour tugs, launches, oil skimmers/waste oil collection boats and other craft available.

According to a report on the inspection of the equipment as part of the Port Master Plan Study, Phase I Report 10/96, prepared by HPTI, about 1/3 of the quay cranes and about 2/3 of the forklift trucks are in such a poor condition or technically obsolete that they are unworthy for repair and should be scrapped. This includes a number of relatively new forklifts that had to be cannibalised due to the lack of spare parts.

In addition to the equipment listed there is a number of grabs and hoppers for bulk handling, lifting appliances for general cargo and spreaders for 20ft containers. There is, however, no dedicated container stacking and unstacking (yard) equipment.

Tab. 5.2-2: Outline of main equipment in the dry cargo port of Baku

Item	Number	Type	Capacity	Make	Year Built
1.1	3	Portal slewing crane	10/15 t	Kirowetz / Abus	1958/1960
1.2	6	Portal slewing crane	6 t	GANZ	1960 - 1986
1.3	4	Portal slewing crane	10/20 t	TAKRAF	1984 - 1990
1.4	4	Portal slewing crane	16/32 t	TAKRAF	1977 - 1987
1.5	1	Portal slewing crane	20/40 t	TAKRAF	1986
2.1	4	Forklift truck	1.5 t	WARNA	1991 - 1993
2.2	13	Forklift truck	1.5 t	TOYOTA	1983 - 1991
2.3	9	Forklift truck	3.0 t	WARNA	1984 - 1994
2.4	1	Forklift truck	4.0 t	STILL	1990
2.5	2	Forklift truck	5.0 t	LVOV	1987
2.6	2	Forklift truck	10.0 t	TOYOTA	1982 - 1985
3.1	4	Terminal tractor	ab. 200 HP	SISU	1983/1993
3.2	2	Agricultural tractor	ab. 50 HP	Russ./MF	1988/1995
4.1	100	Rolltrailer	25 t	?	1983
	5	Drawbar trailers	10 t	?	1988

Source: Baku International Seaport

5.2.3 Port operations and traffic flow

Table 5.2-3 gives the total cargo handled at the Baku International Seaport in 1995 and 1996. The figures for 1996 are estimates based on the actual figures Jan. - Oct. 1996.

Tab. 5.2-3: Cargo handled at Baku International Seaport

Terminal/Commodity Group	1995 (',000 t)	1996 (',000 t)
Dry Cargo Terminal		
Dry Bulk Cargo	105	100
General Cargo	35	20
Sub-Total	140	120
Ferry Terminal	780	640
Apsheron Oil Terminal		
Liquid Bulk	90	70
Total	**1.010**	**830**

Source: Baku International Seaport and Consultant's Estimate

Main dry bulk cargoes were building materials, salt and grain, typical general cargo consisted of sawn timber, iron and steel, chemicals and containers. In 1995 less than 25 % of the general cargo handled at the dry bulk terminal was containerised.

In comparison with the following maximum throughput capacity of the existing facilities as estimated by the Port the a. m. utilisation appears rather low:

-	Dry Bulk Terminal	1.5 million tpy
-	Ferry Terminal	5.5 million tpy
-	Apsheron Oil Terminal	25.0 million tpy

The Port offers its services 24 hours a day on 365 days a year. Due to the present low level of occupancy cargo handling at the Dry Cargo Terminal is normally done during day-shift between 08.00 h and 20.00 h with 2 meal-breaks of 1 ½ hours in total on ordinary working days from Mondays to Fridays. However, the ferries from Baku to Turkmenbashi (the former Krasnovodsk) are dispatched around the clock.

During various visits to the port between 20. 11. and 3. 12. 1996 at the Dry Cargo Terminal only one vessel was discharged with a cargo of about 3,000 t of salt, whereas at the Ferry Terminal one to two ferries per day were dispatched.

The workforce of the Operations Department included the following staff (rounded figures):

-	Dry Bulk Terminal	225
-	Ferry Terminal	35
-	Apsheron Oil Terminal	35
-	Marine Services	165
-	Passenger Terminal	25
-	Other Sections	15

Pre-planning of operations, allocation of berths, equipment, working gangs and railway wagons is done through the Dispatch Office in coordination with the Technological Section on the basis with the practice and standards of the FSU under consideration of local conditions.

During discharge of bulk cargo ex river-sea-vessel with three cranes and working gangs (brigades) in total 22 men are employed equivalent to about 7 men per gang.

Typical output per ship and day based on the „gross normatives" of the Ministry of Ports and USSR Fleet in Moscow for river-sea-vessels under consideration of a „technological map" issued 1982 by the Head of the Technological Section of the Operations Department are:

-	Discharging salt	5,500 tons per vessel and day
-	Discharging grain in bulk	3,000 t/v/d
-	Loading unitised general cargo	1,000 t/v/d
-	Discharging sawn timber	1,700 t/v/d
-	Loading metal	2,000 t/v/d

Information on a performance review regularly or at random in particular on the slack of the actual output figures against the planned ones were not at hand during the visit. Planned performance figures for the dispatch of ferries and the handling of containers were not available.

Far most of the cargo is handled directly onto/from railway wagon, i. e. that the portion of indirectly loaded and discharged cargo is very low. During visits to the Dry Cargo Terminal only some small consignments of salt, scrap and logs were on stock. The transit sheds were empty.

For the Caucasian railway corridor is the railway ferry line linking the Port of Baku with the Port of Turkmenbashi (former Krasnovodsk) is of particular importance. For this ferry service, which is operated by the Caspian Shipping Company, Baku, the following vessels were brought into service during 1984 and 1986:

- SOVETSKIJ DAGESTAN
- SOVETSKIJ TADJIKISTAN
- SOVETSKAYA KIRGIZIA
- SOVETSKAYA KALMIKIA
- SOVETSKIJ AZERBAIJAN
- SOVETSKAYA GRUZIA
- SOVETSKAYA BELORUSSIA
- SOVETSKAYA NAKHICHEVAN

These vessels were built at R. O. Brodogradiliste „Uljanik" shipyard in Pula, Yugoslavia, under the class KM * L 3 I A2 (trailer) of the former USSR Register of Shipping, and have the following leading particulars:

Type of ferry:	DAGESTAN
Operator:	Caspian Shipping Co. (CSC)
GRT:	11,200
DWT:	3,950
Full displacement:	8,800
Length over all:	154,47 m
Width:	18,30 m
Maximum draft:	4,50 m
Capacity:	about 420/510 lane meters or 28 rail wagons/34 trucks + 70 cars

No. of decks	2 (lower deck for cars only)
Service speed:	about 17 kn.

At present 5 of these vessels are allocated to the service between Azerbaijan and Turkmenistan. 2 are chartered out and 1 is under repair.

The sailing distance between Baku and Turkmenbashi is 167 nautical miles. Under consideration of slow steaming on outer and inner approach voyage time is about 14 hours.

The ferries are dispatched at berths Nos. 12 and 13. The sequence of discharging operations is as follows:

1. Berthing, mooring of the vessels, lowering and hydraulic adjustment of the (3-fold) shore ramp
2. Disembarking of passengers
3. Unloading of trucks and unlashing of rail wagons
4. Unloading of rail wagons
5. Unloading of private cars from lower hold

Loading operations are organised in reverse order.

As there is no terminal building for passengers they are transferred by bus to/from the nearby Sea Station (Passenger Terminal). Shunting of rail wagons is done simultaneously with two locomotives to avoid excessive eccentric loads on the ship-to-shore interface during loading and unloading. Therefore, rail wagons are transported in equal lots of minimum 10 to 28 wagons per trip.

Discharging and loading operations are considerably slowed down through clearance of passengers through immigration and customs and of vehicles directly at the ramp, leading to a queue of waiting passengers and vehicles, as the terminal was designed for inland dispatch of rail wagons only and there is no capacity ashore for checking and holding of vehicles, that would allow for the usual separation between cross-border control and loading/unloading operations.

The situation has become worse by the fact that a fixed sailing schedule for the ferries is not practised, through which the booking system and the pre-stowage of trucks could be facilitated and truck waiting times could be minimised.

The total time needed for the dispatch of one ferry with a combined full load incoming and outgoing is at present 6 to 8 hours. This compares with a peak performance ever achieved in the past of 3 hours (rail wagons and passengers only without cross-border control) and about 2 hours that would be needed for similar size and type of ferry for other European short-sea services on the Baltic, North or Mediterranean Sea.

According to CSC at present there is a demand for the shipment of 5 to 30 rail wagons per day. (To compare: The design capacity of the Ferry Service is said to be about 100 rail wagons each incoming and outgoing = in total 200 per day. This would imply 2 x 25 rail wagons in and out during 4 trips per day). Based on the CSC statistics for the first 10 months the following traffic can expected for 1996 (units):

- Rail wagons 5,800
- Trucks 5,200
- Private cars 3,600
- Passengers 16,800

5.2.4 Port organisation

The International Seaport of Baku (ISB) was established on 28. 11. 1994 with Charter No. 407. It is an autonomous port authority and operating company that replaces the former department of CSC. The administration was put directly under Government's jurisdiction and reports at present to the Ministry of Economics (and probably in future to a newly established Ministry of Transport now in discussion).

The Port Authority is a legal body with own seals and accounts. The statute regulates in particular:

- Objectives and functions
- Rights and obligations
- Property of the Port
- Port management
- Basics on calculation of tariffs, accounts and control
- Reorganisation and liquidation

A corporate plan or business plan for the application and full implementation does not exist.

ISB is still working in line with the formerly established organisational structure comprising 10 different departments including the operations, personnel, engineering and harbour master as more important ones although this structure appears outdated. A new objectives and commercially oriented structure is in discussion with the support of HPTI but had not yet been approved and implemented at the time of the visits to ISB due to the obvious difficulty, complexity, sensitivity and time demand related to the general nature of such fundamental changes not only on paper but also and in particular in the minds of all managers and staff in charge.

The new structure, which was still kept confidential during the visit, is expected to be implemented in 1997.

At the time of the field visits ISB employed in total about 800 employees and workers, wherefrom about 500 were assigned to the Operations Department and about 100 to the Technical Department.

Basis for the dispatch of the railway ferries on their route to Turkmenbashi is a special *node-agreement* between the ISB, CSC and the Railway Administration, which regulates the pre-planning and monitoring of operations, means of documentation and communication as well as settlement and clearing of services rendered etc. Apparently there is a need to update this agreement in line with the changes in modal split, services charges and dues, expected future level of traffic and services etc.

5.2.5 Wagon and truck transfer

5.2.5.1 Fundamentals

In 1996, a Node Agreement was concluded between the railways on the one hand and the port on the other hand, which stipulates the exchange of information and operational regulations for handing over the freight wagons. These stipulations relate both to the medium-term planning as well as the operational handling of the multi-modal traffic between Baku-Tovarnaya Station on the one hand and the port or the ferry port on the other hand, and these stipulations apply to import, export and transit.

A Quadripartite Node Agreement deals with the ferry traffic between Baku and Turkmenbashi and was concluded on 14th April 1995 between the Caspian Shipping Company, the Baku AGZD Office, the Port of Baku and the Customs Administration of the Republic of Azerbaijan. This agreement governs the handing over of the wagons from and to the ferry, the necessary transfer documents and customs clearance, as well as the responsibility for the technical check on the wagons, handing over of the freight documents and the drawing up of protocols on damages.

In principle, Baku-Tovarnaya Station is responsible for servicing the ferry and handing over the wagons at the port. There are a receiving/departure group and a ferry group for servicing the ferry, which are the property of the railways. The track installations at the port are the property of the port, which has its own shunting engines, operating in the store and quayage.

5.2.5.2 Operational procedures of the railways

5.2.5.2.1 Ferry traffic

Baladshary Station is the central shunting yard for Baku. This is were the incoming trains are broken up. All those loaded and empty wagons destined for the ferry are collected for Baku-Tovarnaya Station and handed over in a transfer (1st technical shunting operation).

Upon the trains of the West-East direction entering Baku-Tovarnaya, the transfer train is broken up, and those wagons destined for the ferry are collected on one track. The receiving and departure group consists of 17 tracks, the changing group of 5 tracks (2nd technical shunting operation). The station registers the wagons with the ferry port in advance. Then they are shunted to the receiving group of the railways (Annex 5.2-1).

On the basis of the freight documents, the ferry port sets up a cargo schedule, i.e. it is stipulated which wagon is to be shunted to which track of the ferry. The receiving/departure group consists of eight tracks, including four receiving/departure tracks with a usable length of 352 to 415 metres and four shunting tracks with a usable length of 221 to 304 metres. The composition of the wagon group for the ferry (3rd technical shunting operation) is based on the cargo schedule. Then the wagons are transferred to the ferry group. This group consists of 2 x 4 tracks for the respective ferry terminal, specialised in withdrawing and feeding the wagons from and to the ferry. Customs clearance is also conducted at the ferry group. Those wagons not accepted for customs, commercial or technical reasons have to be taken off (4th technical shunting operation) and remain on the draw-out tracks as difference wagons under railway supervision. Then the ferries are serviced (5th technical shunting operation) by shunting engines of the railways, which use three protective wagons at all times (the engine must not access the ferry ramp due to an excess axle load). The ferry is loaded in the following sequence - cars, wagons, trucks. The established priority of the freight wagon trajecting is not always observed. The reasons for this, from the shipping company's point of view, is that the income is not as high as from trucks. Furthermore, illegal extra fees are charged for trucks.

Altogether one has to say that the current operational technology and commercial handling do not satisfy modern requirements.

Container traffic

Container wagons arriving at Baku-Kishli with the Logistic Express, are transferred to the ferry under an agreement with the Azerbaijan haulage company. The operational and commercial treatment is conducted as described under 5.2.3.

In the East-West direction, the captain of the ferry sends a summary advance notification to the ferry port, which in turn informs the railways. Upon the ferry entering the port, and the handing over of the freight documents, the customs clearance is conducted on board. After that, the wagons are drawn off (1st technical shunting operation). The wagons are handed over to the railways in the ferry group, on the basis of an acceptance document. Any damages are registered in writing. Then the wagons are handed over to Baku-Tovarnaya Station with a shunting transfer via the departure group (2nd technical shunting operation). The next shunting step (3rd technical shunting operation) is carried out in dependence on the destination station and the wagons are then passed on to Baladshary Shunting Station with transfer trains, where they are allocated to the respective trains on the basis of the train formation schedule.

As freight traffic is based on request lines, additional waiting time develops due to the collection of wagons at the shunting station until the determined capacity is reached. Container wagons for the Logistic Express are added in Kishli and the Logistic Express always runs on Mondays.

5.2.5.2.2 Port

The port is serviced from Baku-Tovarnaya Station, just as the ferry port. Due to the territorial location, quays 4 to 10 are linked through the Pristan 28 connection and quays 14 to 16 (wood port) through the Post 18 connection. The shunting transfers to the harbour are not secured (manual switches), whereby the engine is situated at the end of the wagon train due to insufficiently developed tracks. It becomes evident from the track chart (Annex 5.2-1) that only this technology is available at the current stage of track development (Annex 5.2-2).

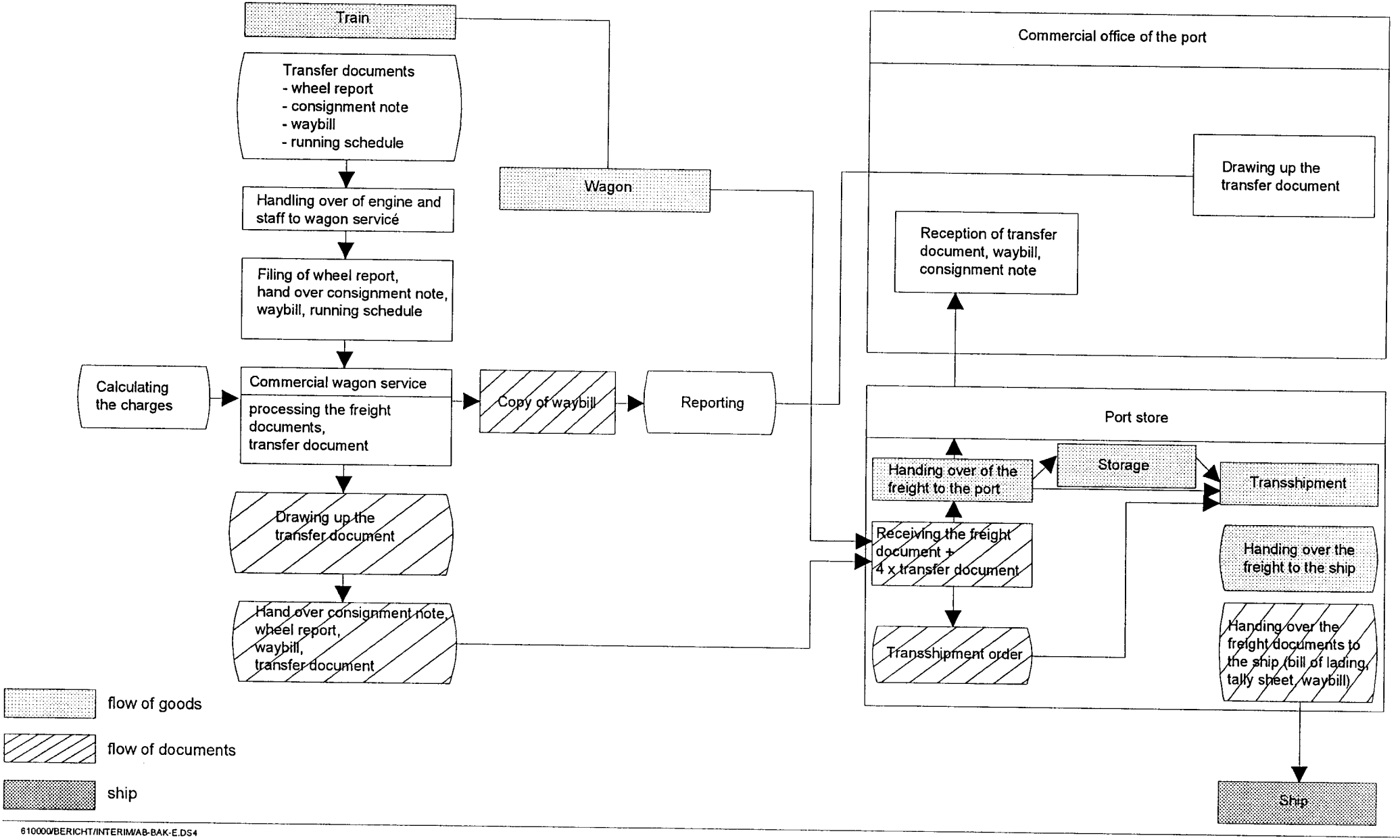
Thus no train can actually enter the port. The railways feed empty wagons (according to the requirements) and take over loaded wagons after completed loading operations. The procedure is descibed in figure 5.2-1.

5.2.6 Ongoing activities on Baku Port development

The Port received a technical assistance programme through TACIS implemented by the Consortium HPTI - UNICONSULT - RECON during January to December 1996. This package covered about 36 man-months external expertise in total and was focused on the following output and main activities:

- Output:
  Support the Management of the Baku Port in the transition to the market economy, by strengthening the management and introducing new policies and

Fig. 5.2 - 1: Handling flow chart rail/port Baku



working methods to cope with the new challenges from the new market oriented environment.

- Main Activities:
  1. Establish private activities/investments in the Port of Baku
  2. Elaborate and implement port infrastructure investment plan
  3. Conduct management training and develop a training scheme
  4. Establish a Free port in Baku
  5. Introduce an appropriate Management Information System
  6. Adjust manpower and equipment to workload

For further details please refer to Technical Assistance for the Development of the Port of Baku, Project Progress Report, 15. 8. 1996, HPTI.

In addition to this technical assistance a Port Masterplan is being prepared by the same team. Furthermore, the Consortium Ramboll - Booz Allen & Hamilton - Probel is in process of preparing the feasibility study, planning and final design documents for the renovation of the Ferry Terminals in Baku and Turkmenbashi.

5.2.7 Existing port problems

As the ports are important nodes of the international transport chains, problems related to ports are also directly or indirectly relevant to the railway corridor.

With reference to the introductory remarks as per Section 5.1 the following problems of the Port of Baku - many of them interrelated issues - are pertinent to note:

I. Legal and institutional problems:

a) National ports policy including institutional framework and delimitation of powers and responsibilities not clearly defined;

b) Role, options and consequences of private sector participation including allocation of main existing and proposed future port sector functions not clear;

c) Outdated port and transport legislation, incomplete/inadequate transport administration (e. g. Ministry or fully fledged transport department);

II. Management, organisational and structural problems:

a) Lack of port pricing policy and cost oriented port tariffs;

b) Lack of corporate strategy and plan or business plan e. g. including marketing strategy, investment plan, manpower plan, operations and productivity improvement plan and financial projection;

c) Lack of internal communication in spite of new MIS proposed and lack of virtual dialogue between parties involved (externally);

d) Lack of market and service orientation and cost consciousness among managers and staff;

e) Outdated node agreement on dispatch of ferries/shipment of rail wagons between CSC, ISB and the railway administration;

f) Traditional working practices and performance standards; low productivity in comparison with Western standards;

g) Level of salaries and wages too low to attract high calibre managers and staff;

h) Low utilisation of existing resources (quays, areas, equipment and personnel);

III. Operational and technical problems:

a) Lack of adequate ferry terminal (poor access and regress, lack of checking and holding areas for trucks and passengers causing interference between discharging and loading operations and gate traffic);

b) Lack of adequate facilities for container handling and storage (container yard, dedicated equipment for stacking and unstacking, possibly also container freight station etc.);

c) Poor technical condition of existing infrastructure, superstructure and equipment; low equipment availability, high down times;

d) Limited capacity of road access to Dry Cargo Terminal;

e) Insufficient capacity of existing ferries and terminal for the transshipment of full trains (of 57 rail wagons);

f) Lack of areas for future expansion of Dry Cargo Terminal and

Ferry Terminal.

The related development objectives and suggested actions to be undertaken to overcome these constraints and weaknesses, their particular relevance to and importance for the railway corridor - as far as not already covered under separate studies - will be included in the Draft Final Report.

5.3 Present conditions in the Port of Poti

5.3.1 Location and nautical conditions

The Port of Poti is located at Lat. 42° 09' N; Long. 41° 39' E and is situated on the SE shore of the Black Sea about 3.2 km North of the mouth of the River Rioni. The Port offers year-round navigation. Pilotage and towage are compulsory except for small coastal vessels under 500 GRT. Pilots board in the outer roads.

The approach to the Port presents no difficulty in clear weather. It is well protected against swell from SW by means of a breakwater. It has direct access from sea via an approach channel of about one km in length, about 70 m in width and a design depth of 12.20 m. Due to siltation and lack of regular maintenance dredging actual water depth was reported to be about 9.00 m only during the visit.

Anchorage can be obtained in the outer roads in two areas at depths from 10 to 30 m about 3 km from shore. In the event of stormy weather, vessels at anchor are recommended to put to sea.

Severe weather conditions from W or NW (known as Tyagun) can make the harbour inaccessible, causing a heavy sea of the head of Zapadnyy Mole.

The largest vessel that was accommodated had about 68,500 dwt and a length of 225 m.

5.3.2 Port infrastructure, superstructure and equipment

The layout of the Port of Poti is shown in Annex 5.3-1. The commercial port comprises berths 1 to 12. The harbour basin inside the southern breakwater is used for ship repairs. Alongside berths 13 and 14 old fishing vessels were laid up. The harbour basin North of the commercial port was used as Russian naval base and is planned to be used in future as expansion of the commercial port (Berths 13, 16 to 21 and 24).

It can be seen from the plan that the Port was designed for the loading and unloading of bulk cargoes from/to railway wagons as is the case with most of the

ports in the FSU countries. At most berths the railway lines are not flush with the quay apron and there are insufficient holding areas, roads and quay areas to allow for an unhampered operation with rolling transport equipment or road vehicles.

The railway network of the port of about 10 km in length is directly linked with the nearby railway station. The port has direct road access to the Southern part as well as to the Northern port complex. The density of the local traffic is low.

The Port offers in total about 22,300 m² covered storage and about 58,500 m² open storage areas. The open storage area behind berths Nos. 1 and 2 is blocked by 120,000 tons of iron ore pellets since about 5 years.

Table 5.3-1 gives the main characteristics of the existing berths. In general the port facilities are still in operating condition in spite of its age and the fact that there is an obvious backlog demand for maintenance and repair.

In Table 5.3-2 the main characteristics of the port equipment are listed. All equipment is said to be relatively new and in operating condition although one quay crane was obviously out of order during the visit and a number of cranes had a lattice structure which was the common type about 30 and more years ago.

Most of the cranes at berths 7 - 11 were refurbished to secure a prompt discharge of food aid recently. This rehabilitation programme was financed by the WFP.

Tab. 5.3-2: Outline of main equipment in the commercial port in Poti

Item	Berth/s	Number	Type	Capacity	Make
1.1	1 & 2	5	Portal slewing crane	16/32 t	SOKOL
1.2	3	5	Portal slewing crane	16/32 t	SOKOL
1.3	4 - 6	4	Portal slewing crane	16/32 t	SOKOL
1.4	4 - 6	2	Portal slewing crane	10/20 t	TAKRAF
1.5	7	3	Portal slewing crane	20/40 t	TAKRAF
1.6	7	1	Portal slewing crane	20/40 t	GANZ
1.7	8	3	Portal slewing crane	16/32 t	SOKOL
1.8	9	2	Portal slewing crane	5/16 t	GANZ
1.9	10	3	Portal slewing crane	10/20 t	TAKRAF
2.1	-	1	Floating crane	30/70 t	GANZ
2.2	-	1	Floating crane	16/35 t	GANZ
3.1	-	25	Forklift truck	1.5 t	TOYOTA
3.2	-	10	Forklift truck	3.2 t	TOYOTA
3.3	-	8	Forklift truck	5.0 t	TOYOTA
3.4	-	2	Container forklift truck	25.0 t	KALMAR

Source: Poti Port Stock Company

Tab. 5.3.-1: Physical characteristics of the commercial port in Poti

Berth Nos.	1 + 2	3	4 - 6	7	8 - 11	12
Assigned Cargo in 1990	Iron ore and bauxite	Metal and steel products	Metals and coal	Containers and general cargo	Chemicals, general cargo and grain	Passengers
Assigned Cargo in 1996	Dry and liquid bulk	Dry bulk	Dry bulk	Containers and Roll-on/Roll-off	General cargo and grain	Passengers
Design Depth	12.50 / 8.50 m	8.50 m	8.50 / 9.75 m	9.75 m	8.10 m	8.50 m
Quay Length	460 m	165 m	520 m	170 m	710 m	230 m
Quay Width	20 m	15 m	20 m	25 m	25 m	10 m
Construction Year	> 30 years	> 50 years	> 50 years	> 50 years	> 50 years	> 30 years
Substructure Construction	Blockwall	Blockwall	Blockwall	Blockwall	Blockwall	Blockwall
Superstructure Construction	Concrete	Concrete	Concrete	Concrete	Concrete	Concrete
Cargo Handling Facilities	Quay cranes, open storage area, pipelines	Quay cranes, open storage area	Quay cranes, open storage area	Quay cranes, open storage area	Quay cranes, open storage area, transit sheds	Passenger terminal building
Access	Rail	Rail	Rail	Road & rail	Rail	Road

Source: Poti Port Stock Company

5.3.3 Port operations and traffic flow

At the time of the visit to the Port berths 1 - 11 were used for cargo handling. At berth No. 1 petrol was discharged from tanker directly into railway wagons, as there were no storage tanks available for this type of cargo. Two more tankers were waiting for discharge at this berth. At berth 7 a container feeder vessel from Mediterranean Shipping Corporation (MSC) was under discharge and at berth 10 frozen beef was unloaded from a reefer vessel directly onto reefer wagons. Total berth occupancy during the visit was 75 %.

The Port handled in 1995 about 1.5 million tons of dry bulk, liquid bulk and general cargo. Total port capacity of the existing facilities is said to be about 7 million tons. Although the larger cargo share consisted of dry bulk cargoes in particular grain there is an upward trend in containerised and RoRo cargoes.

The Port is served by two container feeder lines every fortnight: One is operated by Sea-Land from Triest, the other from Piraeus by East Container Services (ECS) in cooperation with MSC. There are also two weekly RoRo-services with Varna/Burgas and Novorossijsk, although there is no dedicated RoRo-berth.

The Port offers year round port operations. Loading and discharging operations are performed in two shifts of 12 hours with two mealbreaks of 1.5 hours, resulting in a net allocated working time of 21 hours a day. However, work during night-shift between 20.00 h and 08.00 h and on Sundays and holidays largely depend on workload, conditions of the charter party and instructions of the shippers/receivers.

Pre-planning of cargo handling operations is well organised. There is a daily operations meeting together with the shipping agents during which all resources needed for cargo handling such as berths, equipment, personnel and railway wagons/trucks are allocated to work. This includes a detailed working instruction on cargo handling technology such as use of gear, material for lashing and securing of cargo, dunnage etc. and the expected output per shift and crane. The latter ones are based upon the former working norms of the FSU for the Black Sea ports.

The following target output figures per ship and day would be typical for direct operation from vessel to railway wagon and vice versa based on two cranes per vessel. The maximum figures would be about twice as much.

-	grain	5,000 t
-	steel	3,000 t
-	bagged cargo	1,000 t
-	palletised cargo	500 t
-	general cargo (break bulk)	300 t

It is reported from port users that ship and gang output is frequently affected by power cuts and equipment breakdowns.

Due to the fact that far most of the cargo is handled directly onto railway wagon, the governing factor for the cargo handling performance is not the type of commodity, consignment size, type of vessel or the capacity of cargo handling equipment - as in other ports - but the number and type of railway wagons, the number of rail tracks available for cargo handling at the berth and the shunting system.

During the field mission the Port employed a total staff of about 2,500. The number and functions of personnel allocated to loading and discharging operations mainly depend on the type of cargo and method of handling (e. g. manual or mechanised). The system is similar as explained for the Ports of Baku and Batumi.

5.3.4 Port organisation

The following weaknesses of the existing situation on port organisation and administration in Georgia were identified in the Executive Summary Report of the Optimising and Reorganisation Study for the Ports of Poti and Batumi, prepared by HPC in 4/1996 on behalf of the German Agency for Technical Cooperation (GTZ):

„Both ports are still fully government-owned. Legally, they are subordinate to the Marine Department, a statal body responsible for all shipping and port-related activities of the country. The Marine Department determines the prices for the port activities and decides on the allocation of ships, at least for those carrying government-owned cargo.

Since the independence from the Soviet Union, very little has changed in port organisation and cargo operations. Despite the sharp decrease in cargo turnover, both port still keep their number of personnel and cargo handling equipment, thus resulting in high over-capacities in both fields.

The ports are not used to operate according to commercial rules and cost-benefit relations, and - under the present organisation - they are not forced to do so. The costs of individual cargo operations are generally unknown; commercial aspects are hardly considered in decision-making processes. Book-keeping and cost-accounting are done according to the rules of a centralised economy. Besides, marketing strategies and respective know-how are almost completely missing.

In both ports, there are many departments, and the tasks and responsibilities of the individual departments and employees are not clearly specified and overlapping. A high percentage of staff capacity is used for planning, checking and supervision purposes. Due to the inflexible organisation and lack of incentives, the motivation of the employees is generally low. In addition, their qualification is not sufficient for the demands of modern market-oriented port business."

In view of situation, the Georgian government wanted to increase the efficiency of the ports by means of decentralisation, commercialisation and future privatisation.

HPC analysed different options for the reorganisation and eventually recommended to allocate the main port sector functions to the following levels:

a) Public Port Authority and Administration
b) Private Independent Port Operators (responsible for cargo handling operations and facility maintenance etc.)
c) Private Port Service Company

It was also proposed to start with the commercialisation of these activities as a precondition and first step prior to tender for privatisation of port operations (function <b>) and services (function<c>).

Based on these proposals a Bill was launched on the future administration, operation, control and development of the ports and on 17. 8. 1996 this Bill passed legislation as Act No. 541.

In furtherance of this Decree, Articles of Association were prepared for the establishment of the Poti Joint Stock Company. Further to the approval by the Office of the President in 1996 this company was expected to become legally in force as of 1. 1. 1997, notwithstanding the fact that the port administration had been practically working already as a company before that date.

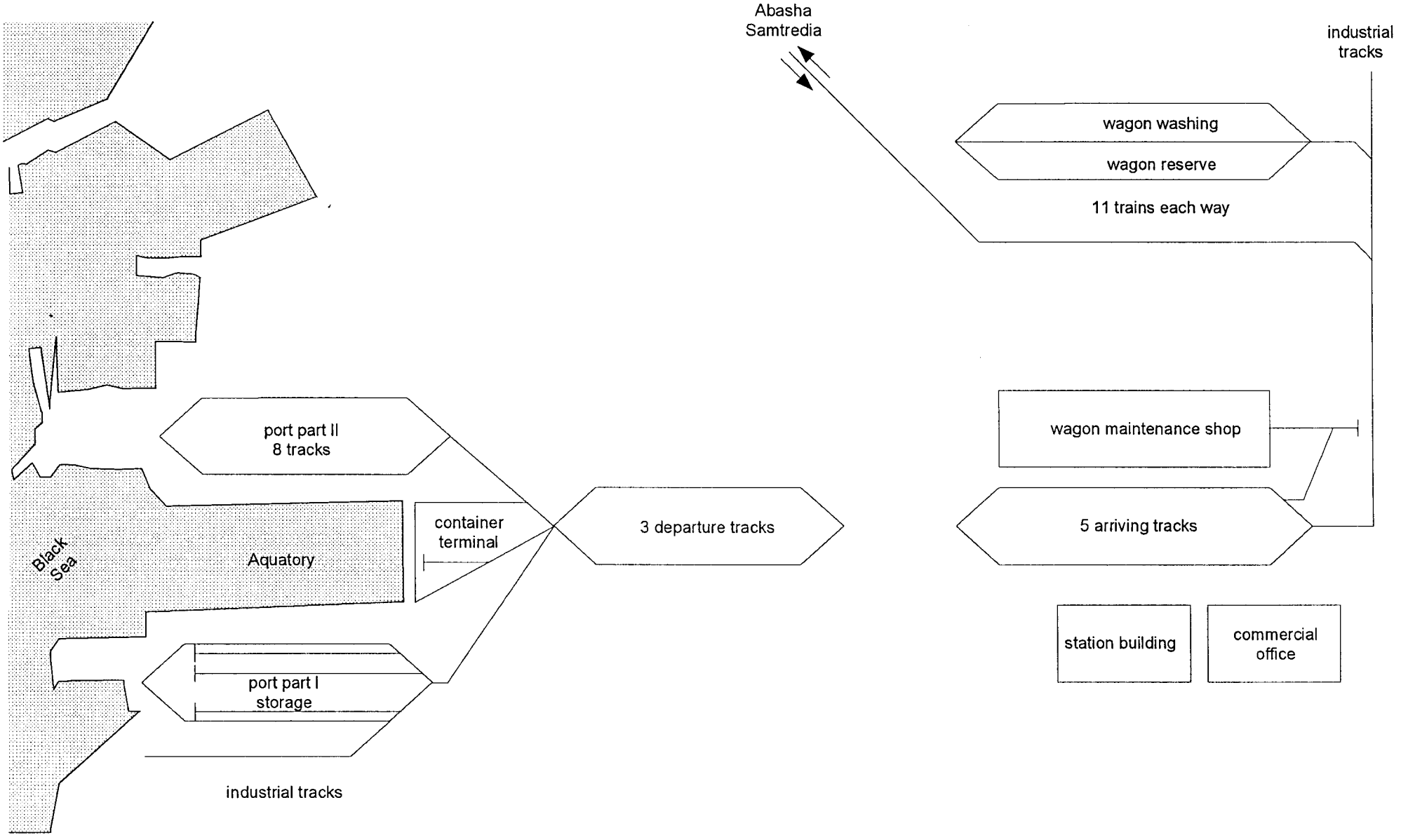
Through this development the course was set to establish a modern port organisation and business fit to cope with the future challenges of the highly competitive transport environment. Bearing in mind that managers and staff of the ports are in focus of the envisaged drastic port sector reform and that attitudes and aptitudes in particular of key personnel have to be changed drastically it appears that further external technical assistance is needed for the successful continuation and completion of reorganisation process initiated.

5.3.5 Wagon and truck transfer

The port is connected by means of the single track, electrified Poti - Abasha line with a theoretical throughput of 22 pairs of trains (11 trains in each direction). At present, 3 pairs of passenger trains and 3 to 4 pairs of freight trains run the line at maximum speeds of 60 km/h and, in places, 40 km/h.

For entry and splitting up of the trains 5 arrival tracks are available. A node agreement regulates the co-ordination between the port and the railway. Following an arrangement between the station inspector and the port dispatcher, the transfer of the wagons is done in the port, Part I, the Container Terminal, and Part II. A Wagon Transfer Log is being kept. For goods imported the port calls for goods wagons, specified as to their types, 24 hrs prior to the arrival of a ship.

Fig. 5.3 - 1: General layout of the railway infrastructure at Poti



Both in the port (Part II) and in the station tracks are available for a wagon reserve (see Fig. 5.3-1).

Subsequent to the docking of the ships, each day at 8.00 hrs a precise request for wagons is made by fax/telephone. Information about containers to be expected is not given until the goods consigned have been cleared by the forwarding agents. If the consignor in the port wants to forward the goods by railway, he hands over the consignment papers in the train dispatching commercial office. In order to get containers available and for their transport it is necessary to make a request to Tbilisi, so as to be assigned wagons and containers, which will only be done upon proof that the freight has been pre-paid; all this resulting in 3 to 4 days time between entry and dispatch.

Transshipment of containers in container traffic is done in the port terminal by 3 cranes, on the area used for intermediate storage of the containers. A direct transshipment ship/rail is not possible.

Owing to the containers being stored twice (at the quay and in the terminal), considerable storage times result for railway transport. Dispatching by truck is done directly from the quay. The transfer time station/ship was indicated to be 5 to 30 hours. The 5 hours refer to special complete trainloads.

In order to improve communication in the port, a computer network is at present being established. As a first step, computer-aided wheel reporting has been realised.

Continuous work in the station is hindered by repeated current blackouts (no PC, fax, or heating), and the competence of the station (cost centre of its own) does not meet the requirements, either.

The access by road from the east is done by a road running parallel to the railway line. This road for its most part is in a deplorable condition, as heavy trucks caused considerable damage.

5.3.6 Ongoing activities on Poti port development

Since 1995 the Ports of Poti and Batumi have got technical assistance from HPC on the reorganisation of the port administration as well as on the assessment of future demand for the ports. This package is financed by the GTZ.

In view of the very limited capacity of the existing container stack of about 150 ground slots in relation with the recent growth in container throughput the Port is planning for the construction of a new container terminal at berth 12. This plan is based on a feasibility study prepared by Sea-Land in 1996. The terminal will be fully equipped with two container gantry cranes, dedicated yard handling equipment, interchange area and good road and rail access. Total investment cost is said to be about US$ 25 million.

The Port expects start of construction in 1997. It is envisaged that the terminal will be operated by a joint venture company with shares from the Port, Sea-Land and probably a consortium of local banks. Details will be finalised as soon as the new Poti Port Stock Company has become fully operational.

It is planned furthermore to construct a new bulk terminal for the transshipment of grain at berth 8 mainly consisting of a grain silo of 5,000 t and two continuous ship unloaders.

According to the feasibility study completed by the Consortium Triton/GEM/AAK in May 1995 the total investments are expected to be about US$ 14.35 million. In cooperation with the EBRD an Invitation for Tenders for a Strategic Partner to Upgrade, Operate and Transfer the Poti Grain Terminal has been published as of 1. 12. 1996.

The Port plans furthermore the construction of a railway ferry terminal for a service to Ukraine, Bulgaria and Romania. This is in furtherance of the endorsed project No. 16 at the TRACECA Working Group Conference held in Venice on 27-28 March 1996. A preliminary design for this terminal at berth 20 has been prepared already, although the Port expects further initiative on a feasibility study, detailed engineering and securing financing of this project from the side of the Commission.

5.3.7 Existing port problems

Please refer also to the introductory remarks as per Section 5.1. The following major problems were identified. Some of them are interrelated issues:

I. Legal and institutional problems:

a) New national ports policy and organisation towards more autonomy to the port authorities, less influence of the Government in day-to-day business and commercialisation/ privatisation of port operations and services not yet applied;

b) National administration within the Ministry of Transport for the control of ports and transport not yet fully established;

c) Future role and functions of the Ports and its competitive situation/market sharing with Batumi not clear;

II. Management, organisational and structural problems:

a) Lack of port pricing policy and cost oriented port tariffs;

b) Lack of corporate strategy and plan or business plan e. g. including marketing strategy, investment plan, manpower plan, operations and productivity improvement plan and financial projection;

c) Lack of internal and external communication;

d) Lack of market and service orientation and cost consciousness among managers and staff;

e) Outdated node/siding agreement between Port and railway administration (train scheduling and shunting, transfer points, information, documentation, dispatch and transport times etc.);

f) Traditional working practices and performance standards; low productivity in comparison with Western standards;

g) Level of salaries and wages too low to attract high calibre managers and staff;

h) Low utilisation of existing resources (quays, areas, equipment and personnel);

III. Operational and technical problems:

a) Lack of adequate facilities for the dispatch of RoRo vessels (shore ramp, access and regress, checking and holding areas for trucks and roll-trailers etc.);

b) Lack of adequate facilities for container handling and storage (container yard, dedicated equipment for stacking and unstacking, possibly also container freight station etc.);

c) Poor technical condition of existing infrastructure, superstructure and equipment; low equipment availability, high down times, lack of regular maintenance dredging;

d) Existing port layout for cost effective use of ship's gear, for indirect handling system and for receipt/delivery by truck inadequate; limited capacity of road accesses; plans for port development do not consider modernisation of existing facilities (apart from container and grain terminals);

e) Lack of terminal for the import of oil products (e. g. gasoline).

Appropriate development objectives and suggested actions to be undertaken to overcome these constraints and weaknesses, their particular relevance to and importance for the railway corridor - as far as not already covered under separate studies - will be identified in the Draft Final Report.

5.4 Present conditions in the Port of Batumi

5.4.1 Location and nautical conditions

The commercial Port of Batumi is situated at the head of the Batumi Bay, on the South part of the Caucasian coast. The position is:

- Lat. 41° 39' N Long. 41° 39' E

The Port has direct access to the sea with water depth between 10.50 and 13.00 m. Approach channel and harbour basin are subject to moderate siltation and have to be dredged in regular intervals. The recommended outer anchorage area is located NNE of the East side of Burun-Tabiya Point in depths ranging from 15 to 20 m. Anchorage in the inner roads can be obtained with prior permission of the Harbour Master.

Pilotage and towage are compulsory.

The Port offers year-round navigation. However, between October and May strong winds from the SW, W and NW can occur, causing a strong variable current with surge in the Port. At the time of this Tyagun condition, vessels are recommended to cease loading/discharging operations, vacate the berth and anchor off, or secure to mooring buoys or put to sea.

Largest vessel that called at the Port had about 70,000 dwt and a length over all of some 240 m.

5.4.2 Port infrastructure, superstructure and equipment

The port has one harbour basin with 9 berths. West of the harbour basin further two berths for passenger vessels are available (berth No. 10 and 11). These are open to the sea, can be used however most of the time during the year as prevailing winds come from SSW and SW directions. North of the breakwater a MBM system (multi-buoy-mooring) is installed for loading of tankers.

The Northern part of the Port was designed for the handling of crude oil and oil products, whereas the Southern section was planned for the loading and discharging of bulk cargoes and general cargo primarily directly onto rail. The Southern part has good rail access directly linked with the marshalling yard of the local railway station. Road access is provided via two gates that lead directly to one of the main roads of the city, one of which was not in use for traffic during the visit. Moderate traffic was observed in the City.

The Port has about 4,000 m^2 transit sheds and some 15,000 m^2 open storage areas. The utilisation of storage space was very low due to the fact that most of the cargo was handled directly to/from railway wagons. A container yard was not available as there were no regular container shipments to/from the Port.

The main characteristics of the existing berths are listed in Table 5.4-1 and the main data on port equipment are given in Table 5.4-2. Berth No. 12 is an off-shore berth outside the Neftyanoy Mole (Northern breakwater) consisting of a multi-buoy mooring system (MBM). Loading of crude oil is done by means of an underwater pipeline and a floating hose which is connected to the manifold of the tankers with a maximum size of about 60,000 dwt.

Tab. 5.4-1: Physical characteristics of the commercial port in Batumi

Berth Nos.	1 + 2	3	4 + 5	6 - 9	10 + 11	12
Assigned Cargo in 1990	Crude oil and oil products	Crude oil and oil products	Crude oil and oil products	Dry bulk and general cargo	Passenger and fresh fruit	Crude oil
Assigned Cargo in 1996	Crude oil and oil products	Crude oil and oil products	Not in use	Dry bulk and general cargo	Passenger and fresh fruit	Crude oil
Design Depth	10.50 m	10.00 m	10.00 m	7.50 - 11.60 m	5.00 - 7.50 m	13.00 m
Quay Length	350.00 m	180.00 m	340.00 m	660.00 m	380.00 m	*n. a. (MBM-system)*
Quay Width	10.00 m	10.00 m	15.00 m	45.00 - 25.00 m	10.00 - 20.00 m	
Construction Year	1905	1905	1878	> 30 years	> 20 years	> 10 years
Substructure Construction	Blockwall	Blockwall	Blockwall	Concrete piles	Concrete piles	n. a.
Superstructure Construction	Concrete	Concrete	Concrete	Concrete	Concrete	n. a.
Cargo Handling Facilities	Pipelines	Pipelines	Pipelines	Quay cranes, transit sheds, open storage	Passenger terminal	Pipeline and floating hose
Access	Road	Road	Road and rail	Road and rail	Road	

Source: Commercial Sea Port of Batumi

Tab. 5.4-2: Outline of main equipment in the commercial port of Batumi

Item	Berth/s	Number	Type	Capacity	Make
1.1	5 & 6	5	Portal slewing crane	10/20 t	TAKRAF
1.2	7	5	Portal slewing crane	5/15 t	GANZ
1.3	8 & 9	5	Portal slewing crane	10/20 t	TAKRAF
2.1	8	2	Suction type elevators for alumina and grain	150 t/h	HARTMANN
3.1	-	10	Forklift truck	1.5 t	TOYOTA
3.2	-	3	Forklift truck	4.0 t	TOYOTA
3.3	-	2	Forklift truck	10.0 t	TOYOTA
4.1	-	3	Wheel loader	3.0 cbm	Komatsu
5.1	-	1	Floating crane	40/100 t	GANZ
5.2	-	1	Floating crane	16/35 t	GANZ

Source: Commercial Sea Port of Batumi

Two oil berths were under repair during the visit. As in most other ports of the FSU also in Batumi there is a general demand for overhauling existing installations, facilities and equipment.

5.4.3 Port operations and traffic flow

In 1995 the Port had the following traffic:

-	406	bulk carriers and general cargo vessels with a total cargo volume of	742,000 t
-	66	tankers with crude oil and oil products	642,000 t
	472	vessels in total with	1,384,000 t

Dry cargo mainly consisted of grain discharged in bulk. Total present port capacity is reported to be 8 million tons for liquid bulk cargo and about 2.2 million tons for dry bulk and general cargo.

The Port offers year round port operations. Loading and discharging operations are performed in two shifts of 12 hours with two meal breaks of 1.5 hours, resulting in a net allocated working time of 21 hours a day. However, work during night-shift between 20.00 h and 08.00 h and on Sundays and holidays depend on workload and payment of overtime.

Cargo handling operations are well pre-planned and organised similar to the details given for the Port of Poti.

The following target output figures per ship and day would be typical for direct operation from vessel to railway wagon and vice versa based on two cranes per vessel. The maximum figures would be about twice as much.

-	grain	3,700 t
-	ore	2,000 t
-	bagged cargo	1,000 t
-	iron and steel	1,000 t
-	palletised cargo	700 t
-	general cargo (break bulk)	500 t
-	sawn timber	500 t

During discharge of bulk grain (food aid for the WFP) the maximum unloading rate was 10,000 t per day by means of 4 shore cranes of 15 t and the use of grabs and hoppers for loading of the wagons.

During the visit to the Port a total workforce of about 1,200 was permanently employed, wherefrom about 25 % was operations personnel and some 15 % was technical personnel.

The number and required qualification of personnel allocated to work mainly depends on the type of commodity, capacity and type of handling equipment and method of handling. Typical gang structure e. g. during discharge of palletised cargo would be as follows:

-	1	foreman
-	4	men on board
-	1	signalman on board
-	1	shore crane driver
-	4	men in wagon/on platform
-	1	signalman ashore
-	1	forklift driver ashore
	12	men in total

During handling of bagged cargo more men are allocated, during discharge of bulk cargoes by means of grab less men would be employed depending, however, on the amount of trimming work required on board. Thus, a relatively flexible gang allocation system is practised. Performance targets as well as gang composition is re-negotiated with the trade union on a yearly basis under consideration of advancements in transport technology.

Due to the fact that far most of the cargo is handled directly onto railway wagon, the governing factor for the cargo handling performance is not the type of vessel or the capacity of cargo handling equipment - as in other ports - but the number and type of railway wagons, the number of rail tracks available for cargo handling at the berth and the shunting system. Experience has shown that the maximum capacity of the Southern dry and general cargo part of the Port is about 100 loaded railway wagons per shift = some 200 wagons per day. Taking an average net load per wagon of 40 t the present total dry cargo capacity for the port would be in the order of 8,000 tons per day.

5.4.4 Port organisation

The information given under 5.3.4 for the Port of Poti is principally also applicable to the Port of Batumi.

5.4.5 Wagon and Truck Transfer

The Port of Batumi is served by the Batumi Tovarnaya freight station / shunting station. Since it is situated in the city centre, its track capacity is limited. Via a single track line Batumi is connected with Supsa station, whence a double track line leads to Samtredia . At present, 8 to 9 trains are running each way, one of which is a passenger train (Tbilisi - Baku).

The automatic electric block system is out of order, resulting in a line capacity of 20 trains each way.

The node agreement of 10-02-1997 regulates the co-ordination between railway and port in the fields: planning of shifts / of routine of the day; supply with and withdrawal of wagons; downtimes of wagons and billing of wagon rents and, finally, effective concerted action.

As can be taken from the general layout of the infrastructure, the supply of wagons to the port is complicated. It is neither possible to shunt the wagons to the loading berths, nor to the stores. Only one track is provided for the port. Every 4 hours the wagons are withdrawn from this track and, by way of a turnout track, are led to the port, their run not being protected by signals. The track system belonging to the port is served by the port's own shunting locomotives. A maximum of 15 wagons can enter any of the quayside transfer tracks.

Since the north end of the station also serves for train runs and supply runs to the depot, and since all of the points have to be switched manually (key dependency), this station is a bottleneck already. Its envisaged expansion by a railway ferry terminal, and the construction of a container terminal would aggravate the situation even more. As can be seen from the figures 5.4-1 and 5.4-2, entry to the ferry /

container terminal would require 4 shunting runs. Direct serving of the container terminal is not possible either, since container trains are not allowed to enter directly. The expansion of the track system as planned from the point of view of the port is not acceptable in terms of operation, since it would severely obstruct port, terminal, and transport operations.

Operating and commercial procedures are subject to a node agreement. 24 hours prior to planning the shifts, the port informs about wagons needed for transfer purposes. In addition, surveys of ships expected, of ships lying in the roads, and of stocks and works in progress.

The delivery control of goods entering/leaving the port is done in the station (customs frontier). Station dispatcher and port dispatcher concert the tasks related to railway operation. There is no fixed timetable for servicing.

The delivery of goods is done on the basis of the consignment papers and receipts. This manual technology leads to further delays.

Road access to the port is only possibly via the city centre. Overflow areas in the municipal area are scarce. The planning for the terminal does not give any indication as to whether customs clearance has been taken into account. An alternative solution might be something like the "stacking principle" (developed by KRUPP), with integrated dispatching. The access road from the north runs across two passes full of curves.

Fig. 5.4 - 1: Fundamental layoutplan of the railway infrastructure in Batumi

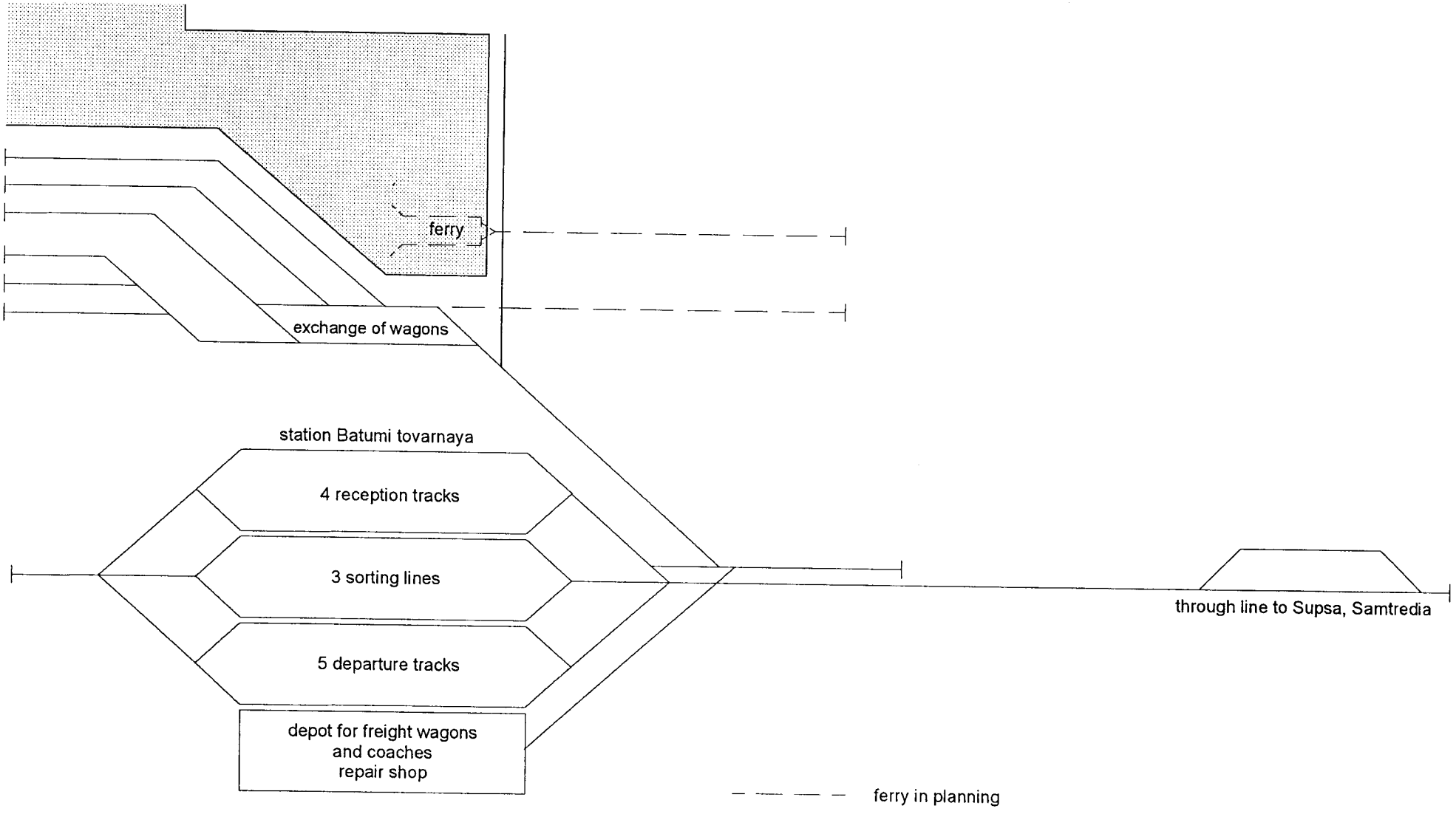
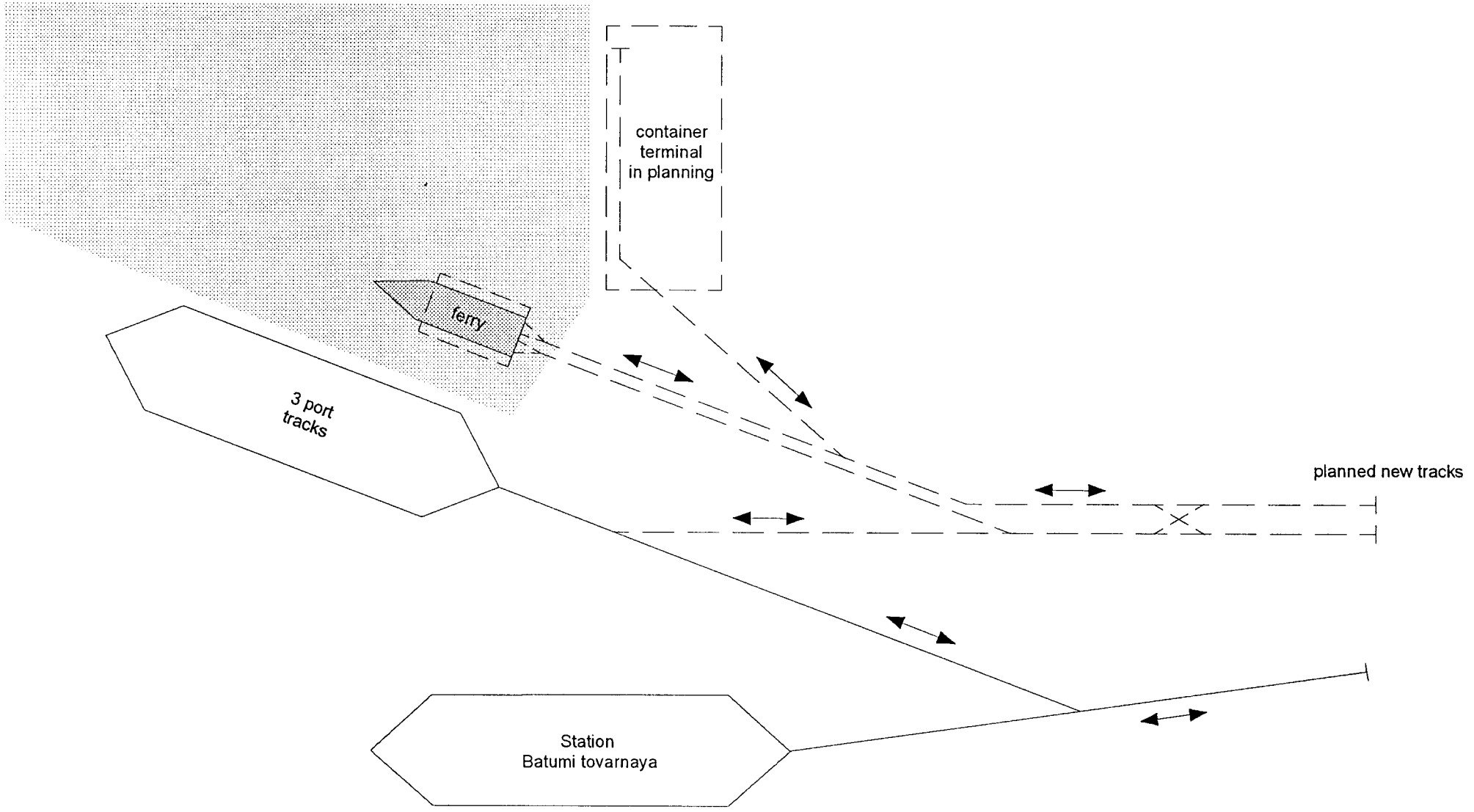


Fig. 5.4. - 2: Planned track development in the port Batumi



5.4.6 Ongoing activities on Batumi port development

The Port plans for the implementation of the following projects:

a) Conversion of berth No. 6 for the accommodation of railway ferries;
b) Construction of a grain silo of 20,000 t at berth No. 8;
c) Construction of a container terminal at the Eastern end of the harbour basin (berths 4 and 5);
d) Construction of a new oil terminal North of the existing harbour basin.

Detailed engineering for the first project was completed in 1996. Site preparation mainly by demolishing existing structures for the provision of railway lines has been started already. The material for the modification and extension of the railway lines has been ordered.

The construction works for the conversion of the berths (primarily consisting of 5 new mooring dolphins and the provision and installation of the access bridge) has been tendered through CENTRACO in Moscow. Total investments are estimated to be about US$ 15 million. Expected time of construction is said to be about 1 ½ years. The terminal will be operated by the joint venture company Batum Mostrans.

It is planned that the terminal will serve a new railway ferry service from Batumi to Ilyichyovsk/Ukraine and Varna/Bulgaria. For the traffic to/from Bulgaria system interchange (change of bogies or rehandling of cargo between standard and wide gauge wagons will be in Varna).

Design vessel is the railway ferry type now in service between Ukraine and Bulgaria with the following leading particulars:

Name of ferry:	Geroi Shipki
Operator:	Black Sea Shipping Co. (BLASCO)
GRT:	10,096
DWT:	12,889
Length over all:	182,21 m
Width:	26,78 m
Maximum draft:	7,40 m
Capacity:	1,650 lane meters or 108 wagons
No. of decks	3
Service speed:	about 20 kn.

Target time for unloading and loading 108 wagons each including time for operating the lift which links the lower deck and upper deck with the main deck is reported to

be 16 hours. Traffic potential in particular for transit traffic to Armenia is said to be about 1.5 million tons net.

On 16. 11. 1996 the Port has placed an order for the final design of the projects b) - d) with Sojusmorniiproekt in Moscow. The envisaged throughput capacities are as follows:

Container	1,5 million tpy
Grain	2,1 million tpy
Oil and oil products	25,0 million tpy

5.4.7 Existing port problems

With reference to the introductory remarks as per Section 5.1 the following problems of the Port of Batumi - many of them interrelated issues - are to be noted:

I. Legal and institutional problems:

a) New national ports policy and organisation towards more autonomy to the port authorities, less influence of the Government in day-to-day business and commercialisation/ privatisation of port operations and services not yet applied;

b) National administration within the Ministry of Transport for the control of ports and transport not yet fully established;

c) Future role and functions of the Ports and its competitive situation/market sharing with Poti not clear;

II. Management, organisational and structural problems:

a) Lack of port pricing policy and cost oriented port tariffs;

b) Lack of corporate strategy and plan or business plan e. g. including marketing strategy, investment plan, manpower plan, operations and productivity improvement plan and financial projection;

c) Lack of internal and external communication;

d) Lack of market and service orientation and cost consciousness among managers and staff;

e) Outdated node/siding agreement between Port and railway administration (train scheduling and shunting, transfer points, information, documentation, dispatch and transport times etc.);

f) Traditional working practices and performance standards; low productivity in comparison with Western standards;

g) Level of salaries and wages too low to attract high calibre managers and staff;

h) Low utilisation of existing resources (quays, areas, equipment and personnel);

III. Operational and technical problems:

a) Lack of adequate facilities for the dispatch of RoRo vessels (shore ramp, access and regress, checking and holding areas for trucks and roll-trailers etc.) although berth for railway ferry under construction;

b) Lack of adequate facilities for container handling and storage (container yard, dedicated equipment for stacking and unstacking, possibly also container freight station etc.);

c) Poor technical condition of existing infrastructure, superstructure and equipment; low equipment availability;

d) Existing port layout for cost effective use of ship's gear, for indirect handling system and for receipt/delivery by truck inadequate; limited capacity of road accesses;

e) Lack of integrated port development plan (in spite of the projects mentioned under 5.4.5);

f) Congestion expected on access sidings for future grain and container terminal;

g) Very limited area for future port expansion (except for the oil terminal).

The related development objectives and suggested actions to be undertaken to overcome these constraints and weaknesses, their particular relevance to and importance for the railway corridor - as far as not already covered under separate studies - will be included in the Draft Final Report.

5.5 Outlook on the assessment of future requirements

5.5.1 General requirements for port terminals within the Railway Corridor

Although future specific requirements, demands or standards for the planning and operation of individual port and ferry terminals can only be identified after the traffic potentials and modal split have been forecast in full consensus with the requirements for the whole transport corridor, it is deemed necessary to identify some general principles for the development of port facilities and terminals already at this stage also to facilitate an assessment of the suitability of existing facilities. Such general requirements would probably include:

a) Sufficient throughput and storage capacities to cope with expected traffic potential, future container forecast and modal split estimations as well as changes in modes of transport or shipping pattern;

b) Separation between ship loading and unloading operation (stevedoring and quay transfer operation) and receipt/delivery operation so as to avoid traffic interference;

c) Comfortably dimensioned traffic and storage areas directly at the berth to secure high and cost effective cargo handling performance as expected by the customers of the terminal;

d) Design of quays, traffic and storage areas for the use of heavy duty rolling transport and handling equipment as well as mobile cranes;

e) Sufficient rail and shunting capacities possibly also for the dispatch/trajecting of full trains;

f) Separate holding (pre-stowage) areas for incoming and outgoing RoRo traffic for house-to-house traffic (accompanied traffic) as well as pier-to-pier traffic (un-accompanied traffic);

g) Flexibility of the terminal to handle a variety of different cargoes (e. g. containers, heavy lifts and hazardous cargoes), to accept receipt/delivery by rail and road, and to dispatch combined rail-/RoRo-ferries (multi-purpose character of the terminal);

h) Excellent seaside, road and rail access;

i) Minimising safety hazards/Optimising occupational and traffic safety;

j) Sufficient, anti-glare type illumination to secure night work;

k) Application of high security standards (e. g. securing of terminal area in line with customs and police requirements; adequate fencing, gatehouses and probably video monitoring;

l) Room for expansion;

m)Work around the year, around the clock;

n) Guaranteed high port performance in particular to maintain agreed ship and train schedules;

o) Modern, high capacity terminal equipment with high grades of reliability and availability;

p) Highly qualified, motivated and productive terminal management and personnel;

q) Integration of all terminal activities within one organisation;

r) Lean and sufficiently autonomous terminal organisation within a transparent legal and institutional environment;

s) Competitive cost oriented port hand cargo handling tariffs, transparent and reliable tariffication system;

t) Integrated documentation and information system including monitoring of the status/location of individual consignments in close cooperation and coordination with railway administration or operator/s, customs and shipping lines.

5.5.2 Outlook on future requirements for the Port of Baku

It is obvious, that the rehabilitation and extension of the existing ferry terminals in Baku and Turkmenbashi, for which final design documents are in preparation and appropriate funds have been earmarked already through EBRD, has got highest priority for the development of Port. Through this renovation and the restructuring of the existing dry cargo terminal towards container handling and RoRo cargo as proposed in the Port Masterplan already under way the most urgent demand for the Port in the near to medium future will be met.

The reorganisation of the port administration and commercialisation of cargo handling operations as suggested by HPTI in the framework of their technical assistance can be considered as an important contribution to make these investments financially and economically viable and as a precondition for development of the Port of Baku as Gateway between East and West.

It is important that the railway corridor is operated from port to port and not from railway station to railway station or inland terminal to inland terminal, so as to

- secure train scheduling integrated with ferry scheduling;
- avoid double handling and trucking of transit containers from an inland terminal to the port and vice versa;
- enable the bundling of container traffic with (priority) conventional cargo;
- use the economies of scale in investments/avoid over-investments;
- secure competitive handling rates through high utilisation of resources (yard, equipment and personnel);
- facilitate consignment monitoring and communication.

Therefore, plans for immediate investments in a „dry" intermodal terminal in or near Baku should be reconsidered and all relevant pros and cons of alternative locations should be assessed systematically using appropriate site selection criteria.

Subject, of course, to detailed analysis of the traffic forecast and capacity calculations still to follow it appears that the envisaged container terminal in the Port would have sufficient spare capacity to handle also local containers and unit loads on the short to medium term, so that probably the construction of a dedicated/larger scale local terminal would be justified only on the longer run.

It can also be expected that the problems listed will be solved in the not too distant future so that they should not be considered as significant constraints against the further development of the railway corridor. This applies not only to the Port of Baku, but also to the Georgian Ports.

5.5.3 Outlook on future requirements for the Port of Poti

Reportedly the Port has taken control over the territory of the former Soviet Naval Base, which is a large spare area for future development. Also various projects as mentioned under Sub-Section 5.3.5 are under way which will boost the port capacity and substantially improve the port performance. This development potential on one hand and the dynamism already developed can be considered as main strengths of the Port of Poti.

It appears, however, that there is still a long way to go until the port is developed to overcome the difficulties mentioned under Sub-Section 5.3.6 and to fully meet future requirements and the initiated process of reorganising the port administration is successfully completed. It is essential for the Port and also for the railway corridor that cargo handling operations are cost effective. This objective can only be achieved by drastic and painful measures such as adapting the resources to the actual workload possibly including reductions in manning levels.

Although the ongoing development and the efforts of the port administration can only be much appreciated, the question should be allowed whether berth No. 8 is the ideal location for the erection of the grain terminal and whether berth No. 12 is the most advantageous location for the container terminal, as from the port zoning point of view it is not recommendable to have bulk cargoes and general cargo concentrated at one area. Therefore, an integrated port master plan is suggested under due consideration of investment and operating costs of alternative development options e. g. to concentrate space intensive operations such as container and RoRo handling at the new port and leave bulk cargoes and conventional cargo at the existing facilities.

Apart from these difficulties and the fine tuning still needed between the Port and the joint venture for the railway corridor, port related impeding factors on the railway corridor are not expected.

5.5.4 Outlook on future requirements for the Port of Batumi

The Port of Batumi has a long tradition in the transshipment of crude oil and oil products as well as in the export of fruits and has successfully tried to diversify and attracted also dry cargo. Due to its location in the City of Batumi, the topography and the road and rail access from the North very close to the shore line the development potential other than for liquid bulk appears rather limited.

Nevertheless, the Port will continue to play an important role as transshipment centre. Investments in a container terminal would probably make sense only on condition that it is a one berth minimum investment which can be used also for heavy lifts, neo-bulk cargoes, project cargo and perhaps RoRo cargo. But, a larger scale investment would directly compete with the terminal in Poti and it appears somewhat difficult that the Port of Batumi can attract regular callers with container feeder vessels within the coming years. Therefore, the role of both ports should be clarified, to avoid duplication of public spending and/or low utilisation of private and public resources.

Also, both ports, Poti and Batumi, want to invest in a new grain terminal mainly for transit grain in bulk. Of course there is a general saying that competition leads to an increased level of service, which the ports are obviously fully aware of. However, in the interest of savings in investment and operating cost and probably also in utilising the economies of scale in bulk shipping it is highly recommendable that the investment policy is reconsidered in this respect as well.

The reconstruction of Berth No. 4 to accommodate a wide-gauge railway ferry is of utmost importance for the railway corridor. The envisaged solution has two operational disadvantages:

a) The two rail tracks for unloading and loading the rail wagons behind the shore ramp have a dead end so that additional shunting is required to the holding area in the vicinity of the berth, from where the rail wagons are transferred to the railway station.

b) The quay construction at berth No. 4 has no protection against propeller erosion. Although a new dolphin and fender line will be provided the use of bow thrusters and propellers most probably will have to be restricted during berthing and unberthing. This will result in certain delays.

In spite of these drawback the project seems to be highly viable in view of the very low investment cost and short implementation time in comparison with the construction of a complete new railferry terminal. Details on the impact of this traffic on the corridor, the dispatch of these ferries and train scheduling, the cooperation with shipping line, port operator, railway administration and the joint venture railway operator are still subject to further study and negotiation.

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Technical Assistance to the Southern Republics of the CIS
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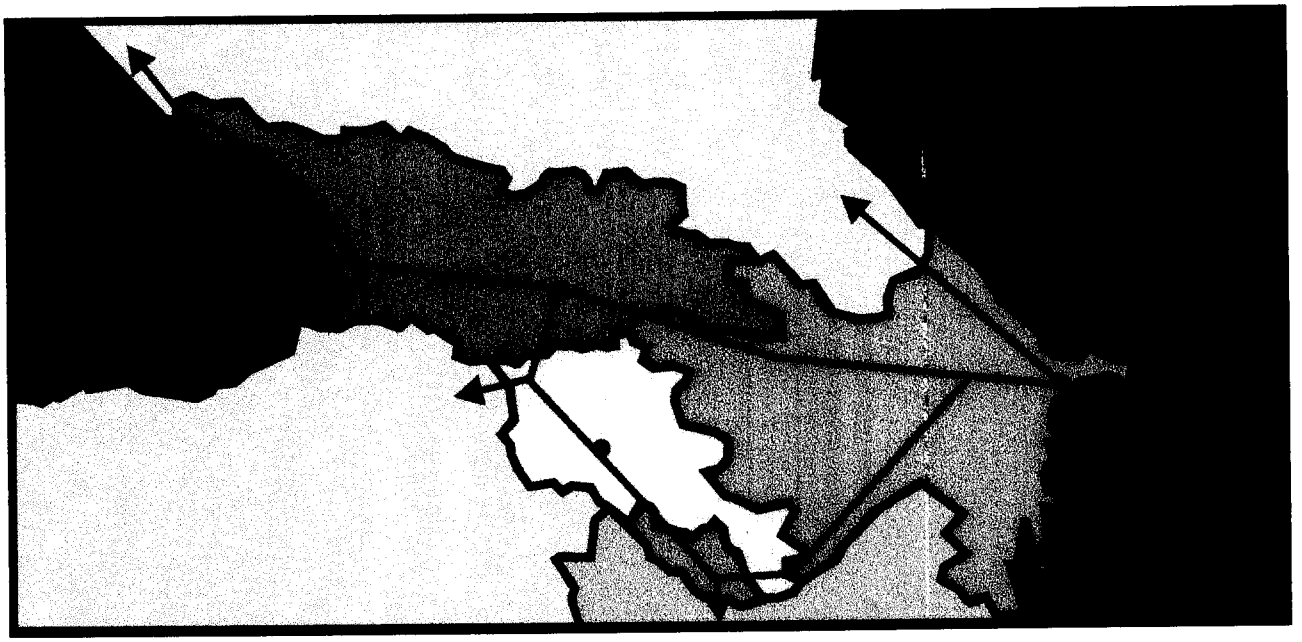
(TNREG 939401)

Joint Venture(s) for the Caucasian Railways



INTERIM REPORT

Volume II (Annexes)

April 1997

TEWET

TRANSPORT EAST WEST EXPERT TEAM GMBH

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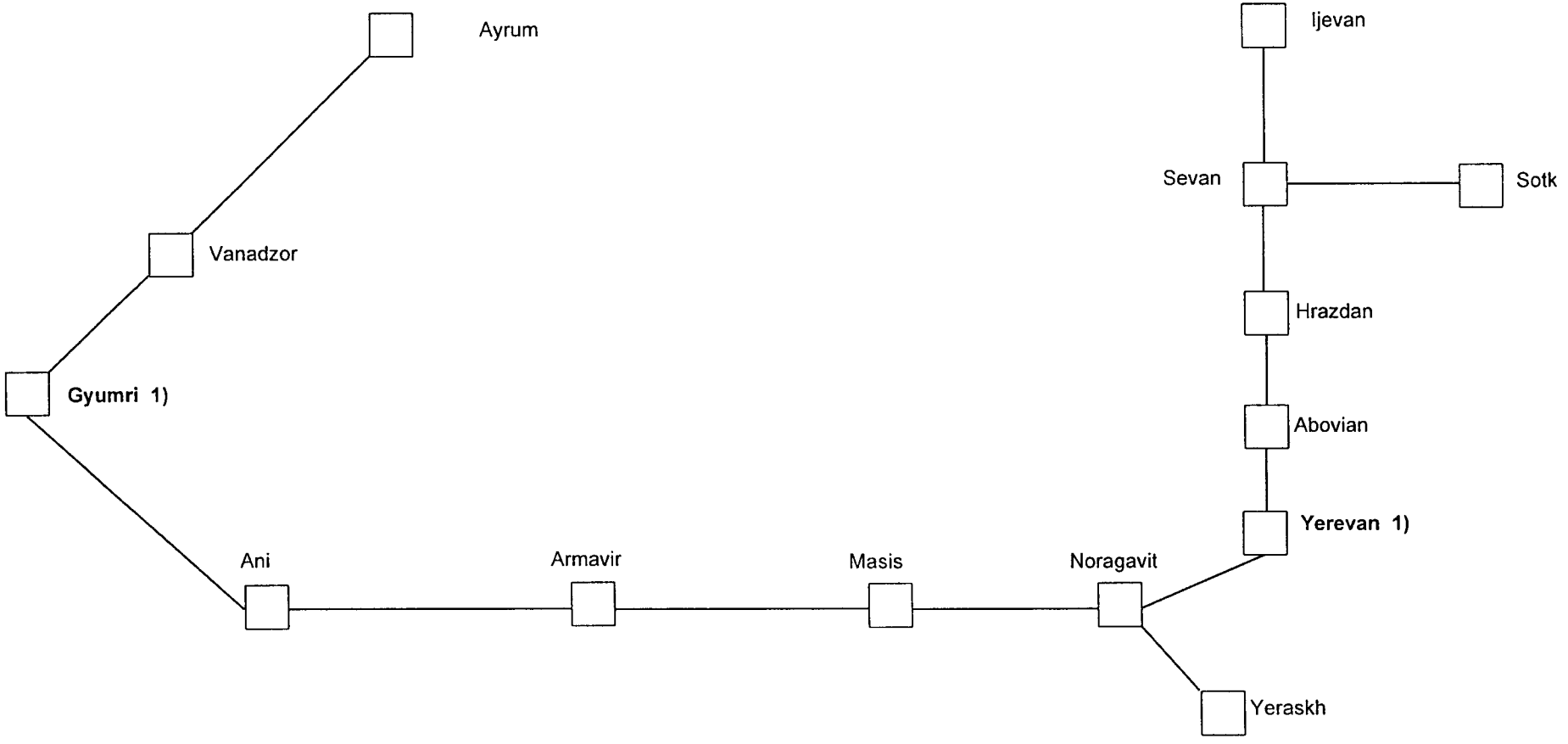
Annex 1.1-1

Repair location for signalling and telecommunication of the ARM [1)]



Annex 1.1-2

Technical Condition of Stations of the Armenian Railway

1	2	3	4	5	6	7	8	9	10	11	12
Number	Name of station	Route	Distance to the next station (km)	Type of station (main function) and category	Number of through tracks / length (m)	Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	Number of storage and other sidings / length (m)	Track condition	Available facilities for freight loading and unloading	Condition of facilities for freight loading and unloading	Number of forwarded wagons in 1995/1996
1	**Ayrum**	**Ayrum - Gyumri (Akhuryan)**	12.8	Border station, Category 2	1 (track No. 2) / 656 m	5 / 781, 624, 624, 518 and 518 m	1 / 300 m	satisfactory	non-existent	-	**(not available)
2	Akhtala		7.9	Intermediate station, Category 4	1 (track No. 2) / 525 m	2 / 516 and 518 m	3 / 493, 170 and 20 m (safety track)	* (not requested for)	*	*	*
3	Akhpat		5	Passenger station, Category 5; (in Russian named: Razjezd)	1 (track No. 2) / 492 m	1 / 488 m	1 / 64 m	*	*	*	*
4	Alaverdi		6.2	Intermediate station, Category 3	1 (track No. 2) / 703 m	3 / 714, 773 and 616 m	4 / 560, 60, 224 and 30 m (safety track)	*	*	*	*
5	**Sanain**		8.1	Intermediate station, Category 2	1 (track No. 3) / 612 m	7 / 500, 500, 531, 344, 344, 624 and 400 m	5 / 66, 60, 220, 460 and 60 m	poor	non-existent	-	**
6	Kober		9	Intermediate station, Category 4	1 (track No. 2) / 507 m	2 / 537 and 570 m	2 / 130 and 32 m	*	*	*	*
7	Tumanyan		8.3	Intermediate station, Category 3	1 (track No. 2) / 598 m	3 / 624, 518 and 500 m	5 / 25, 97, 713, 123 and 75 m	*	*	*	*
8	Shagali		7.7	Intermediate station, Category 4	1 (track No. 3) / 512 m	3 / 512 m each	3 / 46, 20 and 302 m	*	*	*	*

Annex 1.1-2

Technical Condition of Stations of Armenian Railway

1	2	13	14	15	16	17	18		
Number	Name of station	Number of received wagons in 1995/1996	Volume of forwarded freight traffic (tonnes) in 1995/1996	Number of platforms / type / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers departing in 1996	Repair work to tracks and structures required or planned to be carried out / cost estimations made by ARM (USD)		
							Tracks[1)]	Facilities for freight loading and unloading	Station building, platforms and other facilities for passenger traffic
1	**Ayrum**	**	**	2 / low / 340 and 325 m	Station buildung: satisfactory; Platform: poor	8,500	Renewal of 1.4 km (tracks No. 1 and 3) / USD 120,820	n/a (not applicable)	
2	Akhtala	*	*	**	*	*	*	*	*
3	Akhpat	*	*	1 / low / 50 m	*	*	*	*	*
4	Alaverdi	*	*	2 / low / 263 and 371 m	*	*	*	*	*
5	**Sanain**	**	**	2 / low / 400 m each	Station building and platform including staircases to the platform: unsatisfactory	3,200	Renewal of 3.4 km (tracks No. 1, 4, 5, 6 and 7) / USD 178,400	n/a	
6	Kober	*	*	2 / low / 250 and 165 m	*	*	*	*	*
7	Tumanyan	*	*	2 / low / 178 and 219 m	*	*	*	*	*
8	Shagali	*	*	2 / low / 160 m each	*	*	*	*	*

Annex 1.1-2

Technical Condition of Stations of the Armenian Railway

1	2	3	4	5	6	7	8	9	10	11	12
Number	Name of station	Route	Distance to the next station (km)	Type of station (main function) and category	Number of through tracks / length (m)	Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	Number of storage and other sidings / length (m)	Track condition	Available facilities for freight loading and unloading	Condition of facilities for freight loading and unloading	Number of forwarded wagons in 1995/1996
9	Pambak		7.4	Passenger station, Category 5; (Razjezd)	1 (track No. 2) / 560 m	2 / 560 m each	4 / 360, 100, 98 and 160 m	*	*	*	*
10	**Vanadzor**		9.5	Freight and passenger station, Category 1	1 (track No. 2) / 754 m	2 for passenger trains / 542 and 560 m; 11 for freight trains / 437, 789, 759, 797, 780, 779, 857, 850, 680, 680 and 700 m	12 / 228, 262, 91, 223, 100, 173, 125, 202, 180, 58, 15 and 193 m	satisfactory	2 covered storage areas; 1 loading ramp; Goods sheds	satisfactory to poor	100/300
11	Archut		11	Passenger station, Category 5; (Razjezd)	1 (track No. 2) / 545 m	2 / 608 and 609 m	1 / 130 m	*	*	*	*
12	Spitak		9.9	Intermediate station, Category 3	1 (track No. 2) / 537 m	4 / 547, 588, 470 and 375 m	6 / 375, 30, 110, 78, 100 and 110 m	*	*	*	*
13	Nalband		9.8	Intermediate station, Category 3	1 (track No. 2) / 510 m	2 / 486 and 657 m	2 / 40 m each	*	*	*	*
14	Kaltakhchi		9.6	Intermediate station, Category 4	1 (track No. 2) / 532 m	2 / 543 and 538 m	1 / 157 m	*	*	*	*
15	Dzhadzhur		10.1	Intermediate station, Category 4	1 (track No. 3) / 500 m	3 / 510, 510 and 475 m	3 / 129, 48 and 96 m	*	*	*	*
16	Maisyan		10	Intermediate station, Category 4	1 (track No. 2) / 500 m	2 / 578 and 554 m	1 / 80 m	*	*	*	*

Annex 1.1-2

Technical Condition of Stations of Armenian Railway

1	2	13	14	15	16	17	18		
Number	Name of station	Number of received wagons in 1995/1996	Volume of forwarded freight traffic (tonnes) in 1995/1996	Number of platforms / type / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers departing in 1996	Repair work to tracks and structures required or planned to be carried out / cost estimations made by ARM (USD)		
							Tracks[1)]	Facilities for freight loading and unloading	Station building, platforms and other facilities for passenger traffic
9	Pambak	*	*	2 / low / 120 and 100 m	*	*	*	*	*
10	Vanadzor	1,017/436	2,500/10,800	Pass. part: 2 / high / 460 m each Freight part: 2 / low / 200 and 396 m	Station building: satisfactory; Intermediate platform: unsatisfactory	126,300	Renewal of 3.2 km (tracks No. 1, 3, 4 and 6) / USD 402,254	Repair of the loading and unloading facilities / USD 13,000; General overhaul of the gantry crane / ***2,000 USD***	
11	Archut	*	*	1 / low / 70 m	*	*	*	*	*
12	Spitak	*	*	2 / low / 250 and 150 m	*	*	*	*	*
13	Nalband	*	*	2 / low / 250 and 50 m	*	*	*	*	*
14	Kaltakhchi	*	*	2 / low / 125 m each	*	*	*	*	*
15	Dzhadzhur	*	*	2 / low / 100 m each	*	*	*	*	*
16	Maisyan	*	*	1 / low / 96 m	*	*	*	*	*

Annex 1.1-2

Technical Condition of Stations of the Armenian Railway

1	2	3	4	5	6	7	8	9	10	11	12
Number	Name of station	Route	Distance to the next station (km)	Type of station (main function) and category	Number of through tracks / length (m)	Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	Number of storage and other sidings / length (m)	Track condition	Available facilities for freight loading and unloading	Condition of facilities for freight loading and unloading	Number of forwarded wagons in 1995/1996
17	**Gyumri**		11.7	Intermediate station, Category Extra	2 (track No. 2 and 3) / 520 and 767 m	10 / 520, 739, 786, 720, 720, 551, 551, 582, 536 and 597 m	4 / 795, 561, 262 and 260 m	satisfactory	1 container terminal; 1 elevated track for bottom discharge wagons; 1 storage for luggage; Covered and uncovered storage areas for handling goods; Loading ramp; Goods sheds	satisfactory to poor	300/500
18	**Akhuryan**		at present end of the line	Border station (at present closed), Category 1; (Transhipment station)	Part I: 2 / 170 and 500 m; Part II (border area, normal gauge): 2 / 170 and 300 m; Part III: 1 / 300 m	Part I: 2 / 565 and 550 m; Part II: 1 / 238 m; Part III: 2 / 340 and 330 m	Part I: 7 / 562, 562, 660, 562, 562, 670 and 210; Part III: 1 / 40 m	satisfactory	1 loading ramp; Covered and uncovered storage areas for handling goods	satisfactory	0/0
19	**Artik**	**Gyumri - Maralik**	6.3	Intermediate station, Category 2	1 (track No. 3) / 572 m	3 / 333, 333 and 660 m	2 / 439 and 240 m	satisfactory	1 area for handling goods; 1 elevated track for bottom discharge wagons	poor to very poor	**
20	Pemzashen		6	Intermediate station, Category 4	1 (track No. 2) / 500 m	3 / 489, 539 and 499 m	-	*	*	*	*
21	Maralik		End of the line	Terminus, Category 3	-	4 / 497, 500, 373 and 360 m	3 / 100, 176 and 110 m	*	*	*	*

Annex 1.1-2

Technical Condition of Stations of Armenian Railway

1	2	13	14	15	16	17	18		
Number	Name of station	Number of received wagons in 1995/1996	Volume of forwarded freight traffic (tonnes) in 1995/1996	Number of platforms / type / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers departing in 1996	Repair work to tracks and structures required or planned to be carried out / cost estimations made by ARM (USD)		
							Tracks[1)]	Facilities for freight loading and unloading	Station building, platforms and other facilities for passenger traffic
17	**Gyumri**	1,648/1,029	9,900/13,200	2 / high and covered / 430 and 500 m	Station building: satisfactory; Pedestrian subway and and platform No. 2: unsatisfactory	100,000	Renewal of all sleepers / USD 54,196	Repair of the loading and unloading facilities / USD 47,500; General overhaul of the gantry crane (KK-32) / 3,000 USD	
18	**Akhuryan**	0/0	0/0	3 / low / 160, 50 and 60 m	Station building: unsatisfactory	0	Renewal of 1.3 km (tracks No. 1 and 2) / USD 164,422	Renovation of the loading and unloading facilities / USD 10,700 USD; General overhaul of the fork-lifters / USD 10,800	
19	**Artik**	**	**	1 / low / 145 m	Station building and platform: unsatisfactory	18,000	Renewal of all sleepers / USD 16,408	Renovation work / 6,500 USD	
20	Pemzashen	*	*	1 / low / 56 m	*	36,000	*	*	*
21	Maralik	*	*	1 / low / 240 m	*	*	*	*	*

Annex 1.1-2

Technical Condition of Stations of the Armenian Railway

1 Number	2 Name of station	3 Route	4 Distance to the next station (km)	5 Type of station (main function) and category	6 Number of through tracks / length (m)	7 Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	8 Number of storage and other sidings / length (m)	9 Track condition	10 Available facilities for freight loading and unloading	11 Condition of facilities for freight loading and unloading	12 Number of forwarded wagons in 1995/1996
22	Bayandur	**Gyumri - Masis / Arshaluis**	12.5	Intermediate station, Category 3	1 (track No. 1) / 724 m	6 / 725, 750, 480, 718, 718 and 794 m	15 / 860, 860, 900, 880, 860, 870, 870, 236, 235, 750, 850, 700, 100, 40 and 35 m	*	*	*	*
23	Agin		12.2	Intermediate station, Category 4	1 (track No. 1) / 774 m	2 / 764 and 752 m	9 / 695, 330, 221, 221, 50, 170, 130, 150 and 220 m	*	*	*	*
24	Bagravan		8.5	Passenger station, Category 5; (Razjezd)	1 (track No. 1) / 1000 m	1 / 1000 m	1 / 1000 m	*	*	*	*
25	Ani		8.9	Intermediate station, Category 3	1 (track No. 2) / 796 m	5 / 795, 796, 730, 634 and 660 m	3 / 137, 90 and 310 m	*	*	*	*
26	Getap		8.9	Passenger station, Category 5; (Razjezd)	1 (track No. 1) / 796 m	1 / 796 m	-	*	*	*	*
27	Aragats		9	Intermediate station, Category 4	1 (track No. 2) / 857 m	4 / 875, 830, 807 and 808 m	2 / 342and 280 m	*	*	*	*
28	Arteni		8.2	Passenger station, Category 5; (Razjezd)	1 (track No. 2) / 854 m	1 / 860 m	-	*	*	*	*
29	Kharakhert		6.7	Intermediate station, Category 4	1 (track No. 2 / 663 m	3 / 739, 656 and 586 m	2 / 206 and 50 m	*	*	*	*

Annex 1.1-2

Technical Condition of Stations of Armenian Railway

1	2	13	14	15	16	17	18		
Number	Name of station	Number of received wagons in 1995/1996	Volume of forwarded freight traffic (tonnes) in 1995/1996	Number of platforms / type / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers departing in 1996	Repair work to tracks and structures required or planned to be carried out / cost estimations made by ARM (USD)		
							Tracks[1)]	Facilities for freight loading and unloading	Station building, platforms and other facilities for passenger traffic
22	Bayandur	*	*	**	*	12,000	*	*	*
23	Agin	*	*	2 / high / 400 m	*	*	*	*	*
24	Bagravan	*	*	1 / low / 100 m	*	*	*	*	*
25	Ani	*	*	2 / low / 115 and 106 m	*	*	*	*	*
26	Getap	*	*	1 / 100 m	*	*	*	*	*
27	Aragats	*	*	2 / 117 and 150 m	*	*	*	*	*
28	Arteni	*	*	2 / 107 and 140 m	*	*	*	*	*
29	Kharakhert	*	*	2 / 120 and 50 m	*	*	*	*	*

Annex 1.1-2

Technical Condition of Stations of the Armenian Railway

1	2	3	4	5	6	7	8	9	10	11	12
Number	Name of station	Route	Distance to the next station (km)	Type of station (main function) and category	Number of through tracks / length (m)	Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	Number of storage and other sidings / length (m)	Track condition	Available facilities for freight loading and unloading	Condition of facilities for freight loading and unloading	Number of forwarded wagons in 1995/1996
30	**Dalarik**		7.5	Intermediate station, Category 2	1 (track No. 2 / 724 m	5 / 818, 724, 727, 624, 515 and 525 m	2 / 50 and 110 m	satisfactory to poor	1 loading ramp	satisfactory	**
31	Arakhs		10.6	Intermediate station, Category 4	1 (track No. 2 / 929 m	3 / 825, 825 and 1026 m	1 / 25 m	*	*	*	*
32	**Armavir**		14	Intermediate station, Category 2	1 (track No. 2 / 794 m	7 / 772, 734, 736, 504, 457, 454 and 547 m	7 / 15 to 330 m	satisfactory	1 area for handling goods; 1 elevated track for bottom discharge wagons; 1 loading ramp	satisfactory	30/30
33	Arshaluis		End of the line	Terminus, Categry 5 (Razjezd)	1 (track No. 3) / 387	3 / 383,383 and 387 m	3 / 80, 400 and 400 m	*	*	*	*
34	Sovetakhan		8.1	Intermediate station, Category 4	1 (track No. 2 / 696 m	4 / 704, 678, 620 and 519 m	4 / 224, 110, 400 and 400 m	*	*	*	*
35	**Echmiadzin**		12	Intermediate station, Category 2	1 (track No. 2 / 819 m	5 / 797, 855, 678, 672 and 658 m	3 / 200, 100 and 30 m	satisfactory	1 elevated track for bottom discharge wagons; 2 loading ramps	satisfactory	160/30
36	**Masis**		7	Marshalling yard, Category Extra	2 (tracks No. 2 and 3 / 984 and 928 m	20 / 1000, 932, 893, 850, 768, 860, 777, 783, 725, 752, 782, 768, 908, 908, 925, 913, 816, 950, 907 and 865 m	6 / 1124, 777, 883, 490, 700 and 90 m	satisfactory to poor (especially sorting lines)	1 loading ramp; 1 elevated track for bottom discharge wagons	satisfactory	200/500
37	Mkhtchyan	**Masis - Yeraskh**	10	Passenger station, Category 5; (Razjezd)	1 (track No. 1) / 887 m	3 / 857, 825 and 857 m	1 / 25 m	*	*	*	*

Annex 1.1-2

Technical Condition of Stations of Armenian Railway

1	2	13	14	15	16	17	18		
Number	Name of station	Number of received wagons in 1995/1996	Volume of forwarded freight traffic (tonnes) in 1995/1996	Number of platforms / type / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers departing in 1996	Repair work to tracks and structures required or planned to be carried out / cost estimations made by ARM (USD)		
							Tracks[1)]	Facilities for freight loading and unloading	Station building, platforms and other facilities for passenger traffic
30	**Dalarik**	**	**	2 / 235 and 75 m	Station building and platform: unsatisfactory	1,600	Renewal of 2.1 km (tracks No. 3, 4 and 5) / USD 256,606	Renovation work / 4,300 USD	
31	Arakhs	*	*	2 / 150 and 100 m		30,000	*	*	*
32	**Armavir**	168/194	1,800/1,600	2 / 325 and 270 m	Station building and platform: unsatisfactory	37,500	Renewal of 3.3 km (tracks No. 2, 3, 4, 5 and 6) / USD 417,380	General overhaul of the loading and unloading facilities / USD 20,000	
33	Arshaluis	*	*	1 / low / 150 m	*	*	*	*	*
34	Sovetakhan	*	*	2 / 150 m each	*	26,400	*	*	*
35	**Echmiadzin**	971/228	9,100/1,700	2 / 250 m each	Station building and platform: unsatisfactory	43,000	Renewal of 3.0 km (tracks No. 3, 4, 5 and 6) / USD 379,437	Renovation work / USD 8,000	
36	**Masis**	564/945	9,700/23,600	2 / 315 and 324 m	Station building, toilets and platform: unsatisfactory	47,000	Renewal of 9.2 km / USD 1,200,000	no request	
37	Mkhtchyan	*	*	2 / 110 m each	*	12,000	*	*	*

Annex 1.1-2

Technical Condition of Stations of the Armenian Railway

1	2	3	4	5	6	7	8	9	10	11	12
Number	Name of station	Route	Distance to the next station (km)	Type of station (main function) and category	Number of through tracks / length (m)	Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	Number of storage and other sidings / length (m)	Track condition	Available facilities for freight loading and unloading	Condition of facilities for freight loading and unloading	Number of forwarded wagons in 1995/1996
38	Artashat		12	Intermediate station, Category 3	1 (track No. 1 / 894 m	3 / 917, 789 and 883 m	7 / 516, 562, 366, 302, 100, 90 and 81 m	*	*	*	*
39	Aygavan		7	Intermediate station, Category 4	1 (track No. 1 / 752 m	3 / 751, 804 and 448 m	1 / 214 m	*	*	*	*
40	**Ararat**		15	Intermediate station, Category 1	1 (track No. 1 / 803 m	6 / 846, 808, 669, 615, 546 and 546 m	6 / 459, 459, 542, 310, 338 and 274 m	satisfactory to poor	1 loading ramp; 1 elevated track for bottom discharge wagons	satisfactory	2000/2300
41	Yeraskh		at present end of the line	Intermediate station, Category 3	1 (track No. 1) / 855 m	10 / 847, 845, 280, 686, 200, 684, 616, 315, 170 and 126 m	-	*	*	*	*
42	Noragavit	**Yerevan - Masis**	6 (from Yerevan)	Intermediate station, Category 4	4 (track No. 1 / 858 m; 2 / 853; 3 / 830; 4 / 844)	-	-	*	*	*	*
43	**Karmir Blur**		3 (to station No. 44)	Freight station, Category 1	1 (track No. 2) / 608 m	7 / 656, 604, 648, 546, 506, 462 and 462 m	4 / 110, 60, 50 and 50 m	satisfactory	1 Container terminal	see separate Annex	600/700
44	Km 9	**Yerevan - Sevan - Zod**	5	Passenger station, Category 5; (Razjezd)	1 (track No. 1) / 830 m	2 / 942 and 920 m	1 / 50 m	*	*	*	*

Annex 1.1-2

Technical Condition of Stations of Armenian Railway

1	2	13	14	15	16	17	18		
Number	Name of station	Number of received wagons in 1995/1996	Volume of forwarded freight traffic (tonnes) in 1995/1996	Number of platforms / type / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers departing in 1996	Repair work to tracks and structures required or planned to be carried out / cost estimations made by ARM (USD)		
							Tracks[1)]	Facilities for freight loading and unloading	Station building, platforms and other facilities for passenger traffic
38	Artashat	*	*	2 / 160 and 180 m	*	18,000	*	*	*
39	Aygavan	*	*	2 / 160 and 95 m	*	*	*	*	*
40	**Ararat**	2,632/1,973	126,300/152,300	2 / 130 m each	Station building, toilets and platform: unsatisfactory	18,000	Renewal of 4.0 km (tracks No. 2, 3, 4, 5, 6and 7) / USD 505,916	no request	
41	Yeraskh	*	*	2 / 165 and 230 m	*	30,000	*	*	*
42	Noragavit	*	*	2 / 40 and 140 m	*	32,400	*	*	*
43	**Karmir Blur**	1,838/1,669	26,600/27,600	2 / 92 and 200 m	Station building: satisfactory; Platform: satisfactory	0	Renewal of 2.4 km (tracks No. 2, 3, 4 and 5) / USD 309,549	General overhaul of the gantry crane / USD 22,710 for mech. part and 30,000 for electr. part; Purchase of a spreader for 40 ft containers; Other repair work / USD 5,000	
44	Junction Signal box	*	*	1 / 210 m	*	*	*	*	*

Annex 1.1-2

Technical Condition of Stations of the Armenian Railway

1 Number	2 Name of station	3 Route	4 Distance to the next station (km)	5 Type of station (main function) and category	6 Number of through tracks / length (m)	7 Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	8 Number of storage and other sidings / length (m)	9 Track condition	10 Available facilities for freight loading and unloading	11 Condition of facilities for freight loading and unloading	12 Number of forwarded wagons in 1995/1996
45	Spandaryan		9	Passenger station, Category 5; (Razjezd)	1 (track No. 1) / 894 m	3 / 900, 896 and 910 m	1 / 170 m	*	*	*	*
46	Proshyan		8	Passenger station, Category 5; (Razjezd)	1 (track No. 1) / 880 m	2 / 940 m each	1 / 94 m	*	*	*	*
47	Yegvard		7	Intermediate station, Category 5	1 (track No. 1) / 939 m	2 / 986 and 985 m	3 / 231, 200 and 200 m	*	*	*	*
48	Nor Achin		5 to Nurnus	Intermediate station, Category 5	1 (track No. 1) / 876 m	4 / 876, 915, 810 and 810 m	1 / 30 m	*	*	*	*
49	**Yerevan**	**Yerevan - Sotk (via Abovyan)**	8	Passenger and freight station / Marshalling yard, Category Extra	Part I (passenger trains): 2 (track No. 1 and 2) / 586 and 587 m; Part II (freight trains): 1 (track No. 3) / 728 m	Part I: 7 / 573, 565, 391, 424, 375, 327 and 200 m; Part II: 17 / 703, 778, 743, 756, 750, 686, 709, 709, 709, 755, 788, 728, 670, 700, 700, 680 and 624	Part I: 11 / 97, 293, 293, 200, 76, 207, 175, 140, 72, 175 and 167; Part II: 3 / 400, 736 and 180	satisfactory	5 goods sheds; 1 storage with mechanically handling equipment; 1 loading ramp; 1 storage area for heavy goods; 1 elevated track for bottom discharge wagons; 1 loading area for long items; 1 storage for luggage	satisfactory	1,600/700
50	Arabkir		9	Intermediate station, Category 4	1 (track No. 1) / 490 m	2 / 201 and 169 m	3 /130, 45 and 64 m	*	*	*	*

Annex 1.1-2

Technical Condition of Stations of Armenian Railway

1	2	13	14	15	16	17	18		
Number	Name of station	Number of received wagons in 1995/1996	Volume of forwarded freight traffic (tonnes) in 1995/1996	Number of platforms / type / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers departing in 1996	Repair work to tracks and structures required or planned to be carried out / cost estimations made by ARM (USD)		
							Tracks[1)]	Facilities for freight loading and unloading	Station building, platforms and other facilities for passenger traffic
45	Spandaryan	*	*	1 / 200 m	*	*	*	*	*
46	Proshyan	*	*	1 / 210 m	*	*	*	*	*
47	Yegvard	*	*	1 / 210 m	*	*	*	*	*
48	Nor Achin	*	*	1 / 210 m	*	*	*	*	*
49	**Yerevan**	7,429/5,067	68,200 / 35,900	2 / high and covered / 450 m each	Station building and platforms: good; the roof is in urgent need of repair	140,000	Renewal of 1.7 km tracks of the passenger station (No. 4, 5, 6 and 7) / USD 215,014; Marshalling yard: 3.0 km of departure tracks (No. 1, 3 and 4) / USD 379,437 and 2.9 km of sorting lines (No. 5, 6, 7 and 8) / USD 366,789; ***in total around USD 960,000***	Repair of the loading and unloading facilities / USD 43,000; General overhaul of the handling equipment / USD 35,000	
50	Arabkir	*	*	1 / high / 45 m; 1 / low / 65 m	*	30,000	*	*	*

Annex 1.1-2

Technical Condition of Stations of the Armenian Railway

1	2	3	4	5	6	7	8	9	10	11	12
Number	Name of station	Route	Distance to the next station (km)	Type of station (main function) and category	Number of through tracks / length (m)	Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	Number of storage and other sidings / length (m)	Track condition	Available facilities for freight loading and unloading	Condition of facilities for freight loading and unloading	Number of forwarded wagons in 1995/1996
51	Kanaker		6	Intermediate station, Category 3	1 (track No. 2) / 710 m	3 / 722, 719 and 712 m	3 / 140, 140 and 60 m	*	*	*	*
52	**Abovyan**		6	Intermediate station, Category 1	2 (track No. 2 and 3) / 675 and 690 m	2 / 693 and 640 m	9 / 294, 294, 130, 180, 175, 119, 92, 60 and 50 m	poor	1 container terminal; 1 elevated track for bottom discharge wagons	satisfactory to poor	30/200
53	Nurnus		9.3 to Charents avan	Intermediate station, Category 5	1 (track No. 1) / 936 m	2 / 916 and 830 m	1 / 17 m	*	*	*	*
54	Km 51			Branching-off station, Category 4 (Razjezd)	3 (track No. 1, 3 and 7) / 1400, 1250 and 950 m	1 / 553 m	2 / 50 each	*	*	*	*
55	**Charentsavan**		7	Intermediate station, Category 2	1 (track No. 2) / 825 m	5 / 870, 995, 794, 681 and 684 m	2 / 155 and 75 m	satisfactory	1 covered storage area; 1loading ramp	poor	1,500/600
56	Solak		10	Passenger station, Category 5; (Razjezd)	1 (track No. 2) / 850 m	2 / 894 and 916 m	-	*	*	*	*
57	**Hrazdan**		16	Intermediate station, Category 2	2 (track No. 1 and 2) / 935 and 852 m	2 / 709 m each	6 / 795, 298, 298, 830, 616 and 40 m	satisfactory	1 covered storage area; 1 loading ramp	poor	1,000/1,200
58	Tsakhkunk		8.1	Intermediate station, Category 4	1 (track No. 2) / 733 m	2 / 745 and 856 m	6 / 623, 34, 189, 25, 56 and 50 m	*	*	*	*

Annex 1.1-2

Technical Condition of Stations of Armenian Railway

1	2	13	14	15	16	17	18		
Number	Name of station	Number of received wagons in 1995/1996	Volume of forwarded freight traffic (tonnes) in 1995/1996	Number of platforms / type / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers departing in 1996	Repair work to tracks and structures required or planned to be carried out / cost estimations made by ARM (USD)		
							Tracks[1)]	Facilities for freight loading and unloading	Station building, platforms and other facilities for passenger traffic
51	Kanaker	*	*	2 / low / 180 m each	*	18,000	*	*	*
52	**Abovyan**	628/1,263	1,100/8,700	2 / high / 108 and 110 m	Station building and platform: unsatisfactory	20,000	Renewal of 2.8 km (tracks No. 1, 2, 3 and 4) / USD 354,141	Renovation work / USD 8,000	
53	Nurnus	*	*	1 / low / 70 m	*	6,000	*	*	*
54	Km 51	*	*	non-existent	*	*	*	*	*
55	**Charentsavan**	133/272	9,400/37,000	1 / high / 130 m; 1 / low / 92 m	Station building and platform: unsatisfactory	19,000	Renewal of 3.6 km (tracks No. 1, 2, 3 and 4) / USD 455,324	Renovation work / USD 4,300	
56	Solak	*	*	non-existent	*	12,000	*	*	*
57	**Hrazdan**	2,349/2,045	68,500/74,100	2 / low / 192 and 174 m	Station building and platform: unsatisfactory	25,000	Renewal of 2.4 km (tracks No. 1, 3 and 4) / USD 303,549	Renovation work / USD 10,700	
58	Tsakhkunk	*	*	1 / low /105 m	*	*	*	*	*

Annex 1.1-2

Technical Condition of Stations of the Armenian Railway

1	2	3	4	5	6	7	8	9	10	11	12
Number	Name of station	Route	Distance to the next station (km)	Type of station (main function) and category	Number of through tracks / length (m)	Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	Number of storage and other sidings / length (m)	Track condition	Available facilities for freight loading and unloading	Condition of facilities for freight loading and unloading	Number of forwarded wagons in 1995/1996
59	**Sevan**		14.1	Intermediate station, Category 2	1 (track No. 2) / 750 m	3 / 778, 746 and 746 m	10 / 120, 130, 347, 251, 160, 160, 130, 160, 75 and 80 m	satisfactory	1 area for handling containers; 1 elevated track for bottom discharge wagons; 1 loading ramp	poor	200/90
60	Tsovagyukh		31	Intermediate station, Category 4	1 (track No. 2) / 716 m	5 / 731, 698, 708, 620 and 260 m	-	*	*	*	*
61	Shorzha		57	Intermediate station, Category 4	1 (track No. 2) / 790 m	3 / 796, 763 and 663 m	3 / 650, 100 and 252 m	*	*	*	*
62	Vardenis		18.5	Intermediate station, Category 3	1 (track No. 2) / 861 m	3 / 866, 786 and 785 m	7 / 490, 270, 237, 125, 72, 88 and 110 m	*	*	*	*
63	Sotk		End of the line	Terminus, Category 4	1 (track No. 3) / 687 m	5 / 175, 697, 516, 492 and 118 m	5 / 243, 90, 103, 268 and 50 m		*	*	
64	**Kakavadsor**	**Hrazdan - Ijevan** (Due to landslip, the section from Dilijan to Ijevan has been closed for some years)	8.4	Intermediate station, Category 2	1 (track No. 2) / 942 m	11 / 963, 1028, 937, 937, 846, 846, 931, 863, 863, 864 and 884 m	5 / 282, 132, 310, 450 and 440 m	satisfactory	non-existent	-	**
65	Megradsor		14.9	Intermediate station, Category 4	1 (track No. 1) / 962 m	3 / 940, 1002 and 840 m	-	*	*	*	*
66	Fioletovo		17	Passenger station, Category 5; (Razjezd)	1 (track No. 1) / 1122 m	2 / 466 and 906 m	-	*	*	*	*

Annex 1.1-2

Technical Condition of Stations of Armenian Railway

1	2	13	14	15	16	17	18		
Number	Name of station	Number of received wagons in 1995/1996	Volume of forwarded freight traffic (tonnes) in 1995/1996	Number of platforms / type / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers departing in 1996	Repair work to tracks and structures required or planned to be carried out / cost estimations made by ARM (USD)		
							Tracks[1)]	Facilities for freight loading and unloading	Station building, platforms and other facilities for passenger traffic
59	**Sevan**	274/381	11,800/5,100	2 / low / 180 and 170 m	Station building: satisfactory; Platform and fence: unsatisfactory	1,000	Renewal of 3.0 km (tracks No. 1, 2, 3 and 4) / USD 379,437	Repair of the loading and unloading facilities / USD 21,500	
60	Tsovagyukh	*	*	1 / high /220 m; 1 / low / 90 m	*	*	*	*	*
61	Shorzha	*	*	1 / high / 250 m	*	*	*	*	*
62	Vardenis	*	*	1 / high / 210 m	*	*	*	*	*
63	Sotk	*	*	1 / low / 175 m	*	*	*	*	*
64	**Kakavadsor**	**	**	1 / high /250 m	Station building: unsatisfactory	0	Renewal of 4.0 km (tracks No. 7, 8, 9, 10 and 11) / USD 505,916	no request	
65	Megradsor	*	*	1 / low / 400 m	*	*	*	*	*
66	Fioletovo	*	*	1 / low / 700 m	*	*	*	*	*

Annex 1.1-2

Technical Condition of Stations of the Armenian Railway

1	2	3	4	5	6	7	8	9	10	11	12
Number	Name of station	Route	Distance to the next station (km)	Type of station (main function) and category	Number of through tracks / length (m)	Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	Number of storage and other sidings / length (m)	Track condition	Available facilities for freight loading and unloading	Condition of facilities for freight loading and unloading	Number of forwarded wagons in 1995/1996
67	**Dilijan**		28	Intermediate station, Category 2	1 (track No. 1) / 903 m	3 / 1005, 990 and 1070 m	5 / 70, 140, 100, 100 and 57 m	**	1 elevated track for bottom discharge wagons; 1 storage area	very poor	0/0
68	Goyavan		16.1	Passenger station, Category 5; (Razjezd)	1 (track No. 1) / 855 m	2 / 891 and 843 m	-	*	*	*	*
69	**Ijevan**		End of the line	Border station, Category 1	1 (track No. 1) /865 m	9 / 875, 950, 945, 907, 967, 870, 705, 733 and 710 m	7 / 160, 290, 135, 89, 90, 70 and 30 m	**	** (Due to closure of the section between Diliyan and Ijevan; the station is out of use and conserved:)	**	0/0

Annex 1.1-2

Technical Condition of Stations of Armenian Railway

1	2	13	14	15	16	17	18		
Number	Name of station	Number of received wagons in 1995/1996	Volume of forwarded freight traffic (tonnes) in 1995/1996	Number of platforms / type / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers departing in 1996	Repair work to tracks and structures required or planned to be carried out / cost estimations made by ARM (USD)		
							Tracks[1)]	Facilities for freight loading and unloading	Station building, platforms and other facilities for passenger traffic
67	**Dilijan**	0/0	0/0	1 / high / 400 m	Station building and platform: unsatisfactory	0	**	Repair of the loading and unloading facilities / USD 25,800	
68	Goyavan	*	*	1 / low / 400 m	*	*	*	*	*
69	**Ijevan**	0/0	0/0	1 / high / 310 m; 1 / low / 300 m	Station building and platform: unsatisfactory	0	**	no request	

1) not included carriage of the materials

in total around million USD 6.9

Annex 1.1-3

Technical Condition of Stations of the Azerbaijan Railway

1	2	3	4	5	6	7	8	9	10	11	12
Number	Name of station	Route	Distance to the next station (km)	Type of station (main function) and category	Number of through tracks	Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	Number of storage and other sidings / length (m)	Track condition	Available facilities for freight loading and unloading	Condition of facilities for freight loading and unloading	Number of forwarded wagons in 1995
1	**Baku Tovarnaya**	**Baku - Beyuk-Kyassik**	4	Freight station, Category "Extra"	2	7 / 577, 590, 1633, 433, 684, 559 and 640 m (Ferry station: 8 / 468, 514, 1128, 1552, 756, 592, 400 and 360 m)	** (not available)	Baku Tov: good; Ferry station: satisfactory	Storage facilities; Loading ramp	satisfactory	**
2	**Kishli-Baku**		8	Freight station/ Container terminal, Category "Extra"	2	4 / 1458, 1650, 1409 and 1230 m; 2 sorting sidings / 1239 and 976 m	6 / 1000, 1000, 550, 1150, 450 and 660 m; (Container terminal: 4 / 1375, 875, 375 and 1130 m)	satisfactory to poor; container terminal: poor to very poor	Area for handling containers; Storage facilities; Loading ramp; Various cranes	satisfactory (*compare Annex 1.1-9*)	**
3	**Baladshary**		4	Marshalling yard/ Freight station, Category "Extra"	2	Southern part: 9 / 800, 800, 800, 800, 800, 850, 900, 950 and 950 m; Northern part: 10 / 1240, 940, 1030, 1130, 890, 930, 930, 890, 930 and 104 m; 31 sorting sidings / 290, 290, 310, 350, 1185 , 874, 894, 1088, 924, 979, 1126, 1072, 1310, 1227, 1435, 1196, 1146, 1127, 1166, 1201, 1252, 1134, 710, 550, 660, 530, 570, 721, 487, 570 and 1084 m	1 / 560 m	poor good to satisfactory	Storage facilities; Loading ramp	satisfactory	433

Annex 1.1-3

Technical Condition of Stations of the Azerbaijan Railway

1	2	13	14	15	16	17	18		
Number	Name of station	Number of received wagons in 1995	Volume of forwarded freight traffic (tonnes) in1995	Number of platforms / type / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers departing in 1995	Repair work to tracks and structures required or planned to be carried out / cost estimations made by AGZD (USD)		
							Tracks 2)	Facilities for freight loading and unloading	Station buildings, platforms and other facilities for passenger traffic
1	**Baku Tovarnaya**	**	**	non-existent	n/a (not applicable)	** (not available) 1)	Renewal of 1.375 km track / USD 412,000; Replacement of 6 turnouts / USD 240,000; Replacement of 19 sets of turnout and crossing sleepers / USD 190,000	**	n/a
2	**Kishli-Baku**	**	**	1 / high+low / 70+110 m	satisfactory (no station buiding)	**	Renewal of 4.118 + 3.755 c) km track / USD 1,235,400 + 1,126,500; Replacement of 4.289 km sleepers / USD 274,496; Replacement of 22 turnouts / USD 880,000; Replacement of 26 sets of turnout and crossing sleepers / USD 260,000 c) Container terminal	*see Annex 1.1-9*	Repairs to the platform and asphalt work / USD 9,600
3	**Baladshary**	813	17822	in total 3: 1 / high / 446 m; 1 / high+low / 125+425 m; 1 / high+low / 85+250 m	satisfactory to poor	**	Renewal of 7.028 km track / USD 2,108,400; Replacement of 23.3 km sleepers / USD 1,491,200; Replacement of 20 turnouts / USD 800,000; Replacement of 25 sets of turnout and crossing sleepers / USD 250,000	General overhaul of loading equipment / USD 4,800	**

Annex 1.1-3

Technical Condition of Stations of the Azerbaijan Railway

1	2	3	4	5	6	7	8	9	10	11	12
Number	Name of station	Route	Distance to the next station (km)	Type of station (main function) and category	Number of through tracks	Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	Number of storage and other sidings / length (m)	Track condition	Available facilities for freight loading and unloading	Condition of facilities for freight loading and unloading	Number of forwarded wagons in 1995
4	**Baku Pass.**		12	Passenger station, Category "Extra"	2	8 / 350, 325, 320, 275, 275, 350, 350 and 350 m	15 / 380, 400, 450, 450, 375, 425, 500, 550, 850, 530, 550, 600, 560, 400 and 400 m	poor	non-existent	n/a	0
5	Eibat		8	Freight station	2	* (not requested)	*	*	*	*	304
6	Puta		12	Freight station	2	*	*	*	*	*	70
7	Karadag		14	Freight station	2	*	*	*	*	*	5497
8	Sangachhali		9	Freight station	2	*	*	*	*	*	140
9	Duvanniy		14	Freight station	2	*	*	*	*	*	179
10	**Alyat**		14	Marshalling yard/ Freight station, Category 1	2	4 / 1140, 1006, 956 and 1095 m; 4 sorting sidings / 1098, 1000, 1146 and 1072 m	**	satisfactory to poor	**	**	34
11	Atbulak		12	Freight station	2	*	*	*	*	*	*
12	Navagi		8	Freight station	2	*	*	*	*	*	*
13	Pirsagat		10	Freight station	2	*	*	*	*	*	-

Annex 1.1-3

Technical Condition of Stations of the Azerbaijan Railway

1	2	13	14	15	16	17	18		
Number	Name of station	Number of received wagons in 1995	Volume of forwarded freight traffic (tonnes) in1995	Number of platforms / type / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers departing in 1995	Repair work to tracks and structures required or planned to be carried out / cost estimations made by AGZD (USD)		
							Tracks 2)	Facilities for freight loading and unloading	Station buildings, platforms and other facilities for passenger traffic
4	**Baku Pass.**	0	0	in total 7: 2 / low / 625 and 552 m; 4 / high / 440 and 254 m each; 1 / high+low / 276+84 m	satisfactory; Station building requires repair		Renewal of 5.0 km track / USD 1,500,000; Replacement of 3.965 km sleepers / USD 253,760; Replacement of 8 turnouts / USD 320,000; Replacement of 10 sets of turnout and crossing sleepers / USD 100,000	n/a	Repairs to the roof and maintenance of the heating / USD 120,000
5	Eibat	286	7098	*	*	**	*	*	*
6	Puta	168	3499	*	*	**	*	*	*
7	Karadag	1330	321384	*	*	**	*	*	*
8	Sangachhali	301	4826	*	*	**	*	*	*
9	Duvanniy	742	11036	*	*	**	*	*	*
10	**Alyat**	179	1492	1 / high+low / 150+560 m	satisfactory	**	Replacement of 4.765 km sleepers / USD 304.384; Replacement of 2.006 km ballast / USD 21,765; Replacement of 12 turnouts / USD 480,000; Replacement of 9 sets of turnout and crossing sleepers / USD 90,000	**	**
11	Atbulak	*	*	*	*	**	*	*	*
12	Navagi	*	*	*	*	**	*	*	*
13	Pirsagat	*	*	*	*	**	*	*	*

Annex 1.1-3

Technical Condition of Stations of the Azerbaijan Railway

1	2	3	4	5	6	7	8	9	10	11	12
Number	Name of station	Route	Distance to the next station (km)	Type of station (main function) and category	Number of through tracks	Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	Number of storage and other sidings / length (m)	Track condition	Available facilities for freight loading and unloading	Condition of facilities for freight loading and unloading	Number of forwarded wagons in 1995
14	**Kasi-Magomed**		12	Freight station, Category 1	2	6 / 827, 850, 850, 850, 840 and 851 m; 5 sorting sidings / 760, 873, 867, 946 and 946 m	2 / 157 and 158 m	poor to very poor	Storage facilities; Loading ramp	satisfactory	72
15	Mugan		14	Freight station	2	*	*	*	*	*	1
16	Gadzhiyevo		12	Overtaking station	2	*	*	*	*	*	*
17	Padar		13	Overtaking station	2	*	*	*	*	*	*
18	Sagiri		14	Overtaking station	2	*	*	*	*	*	*
19	Kerar		10	Overtaking station	2	*	*	*	*	*	*
20	Kyurdamir		11	Freight station	2	*	*	*	*	*	1067
21	Karabudzhak		10	Overtaking station	2	*	*	*	*	*	*
22	Myusyusli		13	Freight station	2	*	*	*	*	*	88
23	Bargusheti		13	Freight station	2	*	*	*	*	*	-
24	Udshari		9	Overtaking station	2	*	*	*	*	*	349
25	Alikent		11	Overtaking station	2	*	*	*	*	*	*
26	Lyaki		11	Freight station	2	*	*	*	*	*	425
27	Malay		14	Freight station	2	*	*	*	*	*	-

Annex 1.1-3

Technical Condition of Stations of the Azerbaijan Railway

1	2	13	14	15	16	17	18		
Number	Name of station	Number of received wagons in 1995	Volume of forwarded freight traffic (tonnes) in1995	Number of platforms / type / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers departing in 1995	Repair work to tracks and structures required or planned to be carried out / cost estimations made by AGZD (USD)		
							Tracks 2)	Facilities for freight loading and unloading	Station buildings, platforms and other facilities for passenger traffic
14	**Kasi-Magomed**	**	2976	3 / low / 320, 415 and 485 m	satisfactory; Station building is in need of repair	**	Renewal of 4.475 km track / USD1.342.500; Replacement of 0.946 km sleepers and 1.691 km sleepers including ballast / USD 60,544 + 126,571; Replacement of 22 turnouts / USD 880,000; Replacement of 24 sets of turnout and crossing sleepers / USD 240,000	**	Repairs to the station building, especially to the roof, and to the platform including asphalt work / USD 60,000
15	Mugan	**	22	*	*	**	*	*	*
16	Gadzhiyevo	*	*	*	*	**	*	*	*
17	Padar	*	*	*	*	**	*	*	*
18	Sagiri	*	*	*	*	**	*	*	*
19	Kerar	*	*	*	*	**	*	*	*
20	Kyurdamir	**	60416	*	*	**	*	*	*
21	Karabudzhak	*	*	*	*	**	*	*	*
22	Myusyusli	**	3292	*	*	**	*	*	*
23	Bargusheti	*	*	*	*	**	*	*	*
24	Udshari	**	19060	*	*	**	*	*	*
25	Alikent	*	*	*	*	**	*	*	*
26	Lyaki	**	19537	*	*	**	*	*	*
27	Malay	*	*	*	*	**	*	*	*

Annex 1.1-3

Technical Condition of Stations of the Azerbaijan Railway

1	2	3	4	5	6	7	8	9	10	11	12
Number	Name of station	Route	Distance to the next station (km)	Type of station (main function) and category	Number of through tracks	Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	Number of storage and other sidings / length (m)	Track condition	Available facilities for freight loading and unloading	Condition of facilities for freight loading and unloading	Number of forwarded wagons in 1995
28	**Yevlakh**		12	Freight station, Category 1	2	Part A: 7 / 853, 820, 847, 826, 749, 636 and 637 m; Part B: 2 / 714 and 775 m	6 / 90, 80, 100, 124, 221 and 221 m	Part A: satisfactory; Part B: good to satisfactory; Sidings: very poor	Storage facilities; Loading ramp; Cranes	satisfactory to poor	566
29	Mingetchaur Main Station		13	Freight station	2	*	*	*	*	*	2244
30	Mingetchaur City		18	Passenger station station	1	*	*	*	*	*	16
31	Geran		11	Freight station	2	*	*	*	*	*	283
32	Kyurok-Chay		14	Freight station	2	*	*	*	*	*	2
33	Dalimamdli		7	Freight station	2	*	*	*	*	*	130
34	Zazali		10	Freight station	2	*	*	*	*	*	198
35	**Gyandsha**		13	Freight station, Category 1	2	11 / 553, 893, 804, 108, 990, 735, 875, 860, 638, 156 and 864 m; 3 sorting sidings / 872, 885 and 725 m	1 / 682 m	good; Sorting sidings: satisfactory	Area for handling containers; Storage facilities; Loading ramp; Cranes	poor (*compare Ann. 1.1-10*)	1574
36	Alabashli		11	Freight station	2	*	*	*	*	*	143
37	Shamkhor		10	Freight station	2	*	*	*	*	*	2672
38	Dollyar		13	Freight station	2	*	*	*	*	*	1707
39	Dzegam		7	Freight station	2	*	*	*	*	*	5
40	Dyugarli		7	Overtaking station	2	*	*	*	*	*	*
41	Kovlyar		13	Freight station	2	*	*	*	*	*	85
42	Tauz		11	Freight station	2	*	*	*	*	*	377

Annex 1.1-3

Technical Condition of Stations of the Azerbaijan Railway

1	2	13	14	15	16	17	18		
Number	Name of station	Number of received wagons in 1995	Volume of forwarded freight traffic (tonnes) in1995	Number of platforms / type / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers departing in 1995	Repair work to tracks and structures required or planned to be carried out / cost estimations made by AGZD (USD)		
							Tracks 2)	Facilities for freight loading and unloading	Station buildings, platforms and other facilities for passenger traffic
28	**Yevlakh**	**	29074	2 / low / 530 and 570 m	satisfactory; one platform roofing needs repair	**	Renewal of 1.662 km track / USD 498,600; Replacement of 12 turnouts / USD 480,000; Replacement of 18 sets of turnout and crossing sleepers / USD 180,000	General overhaul of loading equipment / USD 6,000	Various repairs / USD 12,000
29	Mingetchaur Main Station	**	126792	*	*	**	*	*	*
30	Mingetchaur City	**	1648	*	*	**	*	*	*
31	Geran	**	12979	*	*	**	*	*	*
32	Kyurok-Chay	**	120	*	*	**	*	*	*
33	Dalimanedli	**	6033	*	*	**	*	*	*
34	Zazali	**	5200	*	*	**	*	*	*
35	**Gyandsha**	**	81384	3 / low / 225, 600 and 220 m	satisfactory to poor	**	Replacement of 10 turnouts / USD 400,000; Replacement of 10 sets of turnout and crossing sleepers / USD 100,000	General overhaul of loading equipment / USD 8,500 (see also *Annex 1.1-10*)	General building maintenance including repairs to the roof / USD 240,000
36	Alabashli	**	6668	*	*	**	*	*	*
37	Shamkhor	**	145697	*	*	**	*	*	*
38	Dollyar	**	183611	*	*	**	*	*	*
39	Dzegam	**	312	*	*	**	*	*	*
40	Dyugarli	*	*	*	*	**	*	*	*
41	Kovlyar	**	4417	*	*	**	*	*	*
42	Tauz	**	23466	*	*	**	*	*	*

Annex 1.1-3

Technical Condition of Stations of the Azerbaijan Railway

1	2	3	4	5	6	7	8	9	10	11	12
Number	Name of station	Route	Distance to the next station (km)	Type of station (main function) and category	Number of through tracks	Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	Number of storage and other sidings / length (m)	Track condition	Available facilities for freight loading and unloading	Condition of facilities for freight loading and unloading	Number of forwarded wagons in 1995
43	Tyatlu		10	Freight station	2	*	*	*	*	*	2
44	**Akstafa**		6	Freight station, Category 1	2	6 / 856, 848, 848, 848, 767 and 774 m	3 / 292, 107 and 60 m	satisfactory to poor	Storage facilities; Loading ramp	satisfactory	75
45	Shakarlyi		8	Overtaking station	2	*	*	*	*	*	-
46	Poilyi		9	Freight station	2	*	*	*	*	*	794
47	Salakhlyi		9	Freight station	2	*	*	*	*	*	49
48	Soyuk-Bulak		11	Freight station	2	*	*	*	*	*	8
49	**Beyuk-Kyassik**		-	Border station, Category 1	2	10 / 865, 800, 800, 878, 878, 908, 1237, 1237, 1050 and 1050 m	**	5 good; 5 very poor	**	**	*0
50	**Yalama**	**Yalama - Baku - Goradiz**	9	Border station/ Freight station, Category 1	2	4 / 1037, 1165, 1099 and 1027 m	**	good to satisfactory	Storage facilities; Loading ramp	poor	608
51	Ledzhet		8	Freight station	2	*	*	*	*	*	*
52	Khudat		8	Freight station	2	*	*	*	*	*	159
53	Kusar-Chay		13	Freight station	2	*	*	*	*	*	5
54	Khachmaz		10	Freight station	2	*	*	*	*	*	351
55	Chartli		12	Freight station	2	*	*	*	*	*	632
56	Sarvan		11	Freight station	2	*	*	*	*	*	*

Annex 1.1-3

Technical Condition of Stations of the Azerbaijan Railway

1	2	13	14	15	16	17	18		
Number	Name of station	Number of received wagons in 1995	Volume of forwarded freight traffic (tonnes) in1995	Number of platforms / type / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers departing in 1995	Repair work to tracks and structures required or planned to be carried out / cost estimations made by AGZD (USD)		
							Tracks 2)	Facilities for freight loading and unloading	Station buildings, platforms and other facilities for passenger traffic
43	Tyatlu	**	51	*	*	**	*	*	*
44	**Akstafa**	**	4197	in total 2: 1 / high / 250 m; 1 / low / 560 m	satisfactory	**	Renewal of 1.985 km track / USD 595,620; Replacement of 2 turnouts / USD 80,000; Replacement of 7 sets of turnout and crossing sleepers / USD 70,000	**	Repairs to the roof and fencing / USD 48,000
45	Shakarlyi	*	*	*	*	**	*	*	*
46	Poilyi	**	44212	*	*	**	*	*	*
47	Salakhlyi	**	1946	*	*	**	*	*	*
48	Soyuk-Bulak	**	3206	*	*	**	*	*	*
49	**Beyuk-Kyassik**	0	0	2 / low / 400 m each	satisfactory	**	Renewal of 4.264 km track / USD 1,279,200; Replacement of 2 turnouts / USD 80,000; Replacement of 7 sets of turnout and crossing sleepers / USD 70,000	Construction of a new building for border and customs control	Asphalt work / USD 9,600
50	**Yalama**	841	9274	3 / low / 450, 400 and 450 m	satisfactory; the platforms are in need of repair	**	Replacement of 8 turnouts / USD 320,000; Replacement of 11 sets of turnout and crossing sleepers / USD 110,000	**	Asphalt work / USD 12,000
51	Ledzhet	*	*	*	*	**	*	*	*
52	Khudat	240	8155	*	*	**	*	*	*
53	Kusar-Chay	8	124	*	*	**	*	*	*
54	Khachmaz	1111	13508	*	*	**	*	*	*
55	Chartli	56	37000	*	*	**	*	*	*
56	Sarvan	*	*	*	*	**	*	*	*

Annex 1.1-3

Technical Condition of Stations of the Azerbaijan Railway

1	2	3	4	5	6	7	8	9	10	11	12
Number	Name of station	Route	Distance to the next station (km)	Type of station (main function) and category	Number of through tracks	Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	Number of storage and other sidings / length (m)	Track condition	Available facilities for freight loading and unloading	Condition of facilities for freight loading and unloading	Number of forwarded wagons in 1995
57	**Divichi**		9	Freight station, Category 1	2	Northern part: 9 / 1085, 1111, 942, 1262, 1058, 1052, 1209, 1045 and 1200 m; Southern part: 4 / 953, 945, 971 and 1048 m	**	good	Storage facilities; Loading ramp	satisfactory	382
58	Gilgil-Chay		10	Freight station	2	*	*	*	*	*	48
59	Kizil-Burun		11	Freight station	2	*	*	*	*	*	27
60	Siazan		9	Freight station	2	*	*	*	*	*	*
61	Zorat		10	Freight station	2	*	*	*	*	*	*
62	Kilyazi		7	Freight station	2	*	*	*	*	*	1342
63	Sital-Chay		10	Freight station	2	*	*	*	*	*	*
64	Yashma		11	Freight station	2	*	*	*	*	*	36
65	**Shirvan**		1	Freight station, Category "Extra"	2	27 / 985, 875,850, 850, 843, 968, 1039, 1050, 1207, 1015, 1937, 1075, 1275, 1275, 1800, 1890, 1800, 1785, 1800, 1800, 1800, 1775, 1785, 1775, 1785, 1785 and 1950 m; 42 sorting sidings / 8 x 1100, 6 x 1175, 5 x 1050, 4 x 1000, 3 x 975, 3 x 1025, 3 x 1150, 3 x 1200, 2 x 1125, 2 x 1075, 1x 1250, 1 x 800, 1 x 850 m	**	good to satisfactory good to satisfactory	Storage facilities	poor	46
66	Seynalabdin		9	Freight station	2	*	*	*	*	*	219
67	Sumgait		11	Freight station	2	*	*	*	*	*	2569
68	Gyuzdek		8	Freight station	2	*	*	*	1 elevated track for bottom discharge wagons	*	12621

Annex 1.1-3

Technical Condition of Stations of the Azerbaijan Railway

1	2	13	14	15	16	17	18		
Number	Name of station	Number of received wagons in 1995	Volume of forwarded freight traffic (tonnes) in1995	Number of platforms / type / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers departing in 1995	Repair work to tracks and structures required or planned to be carried out / cost estimations made by AGZD (USD)		
							Tracks 2)	Facilities for freight loading and unloading	Station buildings, platforms and other facilities for passenger traffic
57	**Divichi**	943	10626	1 / high+low / 400 and 440 m	satisfactory	**	Replacement of 13 turnouts / USD 520,000; Replacement of 27 sets of turnout and crossing sleepers / USD 270,000	**	Asphalt work / USD 12,000
58	Gilgil-Chay	0	2400	*	*	**	*	*	*
59	Kizil-Burun	156	1046	*	*	**	*	*	*
60	Siazan	*	*	*	*	**	*	*	*
61	Zorat	*	*	*	*	**	*	*	*
62	Kilyazi	1787	52100	*	*	**	*	*	*
63	Sital-Chay	*	*	*	*	**	*	*	*
64	Yashma	51	1075	*	*	**	*	*	*
65	Shirvan	0	2041	1 / low / 45 m	poor	**	Replacement of 35 turnouts / USD 1,400,000; Replacement of 30 sets of turnout and crossing sleepers / USD 300,000	**	Repairs to the platform and station building / USD 7,300
66	Seynalabdin	1251	9219	*	*	**	*	*	*
67	Sumgait	12956	122323	*	*	**	*	*	*
68	Gyuzdek	15	870322	*	*	**	*	*	*

Annex 1.1-3

Technical Condition of Stations of the Azerbaijan Railway

1 Number	2 Name of station	3 Route	4 Distance to the next station (km)	5 Type of station (main function) and category	6 Number of through tracks	7 Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	8 Number of storage and other sidings / length (m)	9 Track condition	10 Available facilities for freight loading and unloading	11 Condition of facilities for freight loading and unloading	12 Number of forwarded wagons in 1995
69	Khirdalan		2	Freight station;Container terminal	2	*	*	*	Stoarage facilities; Container terminal (*compare Annex 1.1-11*)	*	165
	Baladshary		12	**see No. 3**							
	Baku Pass.		12	**see No. 4**							
	Eibat		8	**see No. 5**							
	Puta		12	**see No. 6**							
	Karadag		14	**see No. 7**							
	Sangachaliy		9	**see No. 8**							
	Duvanniy		14	**see No. 9**							
	Alyat		5	**see No. 10**							
70	Alyat Nov.		16	Overtaking station	2	*	*	*	*	*	34
71	Znoiniy		15	Overtaking station	2	*	*	*	*	*	*
72	Garakyuna		8	Overtaking station	2	*	*	*	*	*	*
73	**Ali-Bayramli Sort.**		4	Marshalling yard, Category 1	2	6 / 894, 838, 792, 594, 575 and 572 m	1 / 595	satisfactory to poor	non-existent	n/a	*

Annex 1.1-3

Technical Condition of Stations of the Azerbaijan Railway

1	2	13	14	15	16	17	18		
Number	Name of station	Number of received wagons in 1995	Volume of forwarded freight traffic (tonnes) in1995	Number of platforms / type / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers departing in 1995	Repair work to tracks and structures required or planned to be carried out / cost estimations made by AGZD (USD)		
							Tracks 2)	Facilities for freight loading and unloading	Station buildings, platforms and other facilities for passenger traffic
69	Khirdalan	1393	3794	*	*	**	*see also Annex 1.1-11*	*	*
	Baladshary	**see No. 3**							
	Baku Pass.	**see No. 4**							
	Eibat	**see No. 5**							
	Puta	**see No. 6**							
	Karadag	**see No. 7**							
	Sangachaliy	**see No. 8**							
	Duvanniy	**see No. 9**							
	Alyat	**see No. 10**							
70	Alyat Nov.	179	1492	*	*	**	*	*	*
71	Znoiniy	*	*	*	*	**	*	*	*
72	Garakyuna	*	*	*	*	**	*	*	*
73	**Ali-Bayramli Sort.**			2 / high+low/ 100+300 m	satisfactory	**	Renewal of 1.499 km track / USD 1,049,700; Replacement of 20 turnouts / USD 800,000; Replacement of 20 sets of turnout and crossing sleepers / USD 200,000	**	Various repairs / USD 7,300

Annex 1.1-3

Technical Condition of Stations of the Azerbaijan Railway

1	2	3	4	5	6	7	8	9	10	11	12
Number	Name of station	Route	Distance to the next station (km)	Type of station (main function) and category	Number of through tracks	Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	Number of storage and other sidings / length (m)	Track condition	Available facilities for freight loading and unloading	Condition of facilities for freight loading and unloading	Number of forwarded wagons in 1995
74	Ali-Bayramli Glav. (Main Station)		12	Freight station	2	*	*	*	Storage facilities; Loading ramp	*	432
75	Osmanli		14	Overtaking station	2	*	*	*	*	*	*
76	Myursali		11	Freight station	1	*	*	*	*	*	32
77	Saradzhalyar		11	Freight station	1	*	*	*	*	*	709
78	Saatli		13	Freight station	1	*	*	*	*	*	218
79	Bedzhari		16	Overtaking station	1	*	*	*	*	*	*
80	**Imishli**		14	Freight station, Category 1	1	5 / 920, 834, 862, 827 and 876 m; 4 sorting sidings / 836, 836, 834 and 834 m	2 / 220 m each	poor to very poor	Storage facilities; Loading ramp	satisfactory	619
81	Vatagi		12	Freight station	1	*	*	*	*	*	2890
82	Khalach		14	Freight station	1	*	*	*	*	*	-
83	Dashburun		11	Freight station	1	*	*	*	*	*	804
84	Begmanli		10	Freight station	1	*	*	*	*	*	-
85	Bala-Begmanli		5	Overtaking station	1	*	*	*	*	*	*
86	Gachily		13	Overtaking station	1	*	*	*	*	*	*

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Technical Condition of Stations of the Azerbaijan Railway

1	2	13	14	15	16	17	18		
Number	Name of station	Number of received wagons in 1995	Volume of forwarded freight traffic (tonnes) in1995	Number of platforms / type / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers departing in 1995	Repair work to tracks and structures required or planned to be carried out / cost estimations made by AGZD (USD)		
							Tracks 2)	Facilities for freight loading and unloading	Station buildings, platforms and other facilities for passenger traffic
74	Ali-Bayramli Glav. (Main Station)	22785	21875	*	*	**	Renewal of 3.371 km track / USD 1,011,300; Replacement of 0.894 km sleepers / USD 57,216; Replacement of 10 turnouts / USD 400,000; Replacement of 10 sets of turnout and crossing sleepers / USD 100,000	*	*
75	Osmanli	*	*	*	*	**	*	*	*
76	Myursali	128	1859	*	*	**	*	*	*
77	Saradzhalyar	861	19793	*	*	**	*	*	*
78	Saatli	218	13032	*	*	**	*	*	*
79	Bedzhari	*	*	*	*	**	*	*	*
80	**Imishli**	1040	30466	2 / low / 325 and 650 m	poor	**	Renewal of 5.602 km track / USD 1,680,600; Replacement of 25 turnouts / USD 1,000,000; Replacement of 20 sets of turnout and crossing sleepers / USD 200,000	**	Repairs to the platforms and station building / USD 24,000
81	Vatagi	459	181240	*	*	**	*	*	*
82	Khalach	30	**	*	*	**	*	*	*
83	Dashburun	744	39952	*	*	**	*	*	*
84	Begmanli	*	*	*	*	**	*	*	*
85	Bala-Begmanli	*	*	*	*	**	*	*	*
86	Gachily	*	*	*	*	**	*	*	*

Annex 1.1-3

Technical Condition of Stations of the Azerbaijan Railway

1	2	3	4	5	6	7	8	9	10	11	12
Number	Name of station	Route	Distance to the next station (km)	Type of station (main function) and category	Number of through tracks	Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	Number of storage and other sidings / length (m)	Track condition	Available facilities for freight loading and unloading	Condition of facilities for freight loading and unloading	Number of forwarded wagons in 1995
87	**Goradiz**		at present end of the line	Freight station, Category 1	1	4 / 848, 920, 8882 and 845 m	1 7 259 m	satisfactory	Storage facilities; Loading ramp; 1 crane	poor	-
88	**Salyany**	**Ali-Bayramli - Astara**	47 from Ali-Bayramli	Freight station; Category 1	1	13 / 883, 1000, 113, 926, 913, 858, 961, 966, 892, 851, 851, 880 and 911m	1 / 905 m	good to satisfactory	2 cranes	satisfactory	**
89	**Astara**		136 from Salyany	Border station	1	10 / 830, 1079, 1071, 916, 915, 874, 874, 916, 892 and 851 m	1 / 851 m	poor to very poor	Storage area (rented out)	**	**

Annex 1.1-3

Technical Condition of Stations of the Azerbaijan Railway

1	2	13	14	15	16	17	18		
Number	Name of station	Number of received wagons in 1995	Volume of forwarded freight traffic (tonnes) in1995	Number of platforms / type / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers departing in 1995	Repair work to tracks and structures required or planned to be carried out / cost estimations made by AGZD (USD)		
							Tracks 2)	Facilities for freight loading and unloading	Station buildings, platforms and other facilities for passenger traffic
87	Goradiz	*	*	2 / low / 345 m each	poor to very poor	**	Replacement of 3 turnouts / USD 120,000; Replacement of 10 sets of turnout and crossing sleepers / USD 100,000	General overhaul of the crane and asphalt work / USD 12,000	Repairs to the platforms and station building; asphalt work / USD 24,000
88	**Salyany**	**	**	2 / low / 450 m each	poor	**	Renewal of 0.905 km track / USD 271,500; Replacement of 8 turnouts / USD 320,000; Replacement of 15 sets of turnout and crossing sleepers / USD 150,000	Repairs to the crans / USD 4,800	Repairs to the platforms and station building / USD 19,300
89	**Astara**	**	**	2 / low / 450 and 100 m	poor	**	Renewal of 10.069 km track / USD 3,020,700; Replacement of 4 turnouts / USD 160,000; Replacement of 10 sets of turnout and crossing sleepers / USD 100,000	**	Repairs to the platforms and station building / USD 24,000

1) **Passenger traffic in 1995:**
in total: 8,964,000 passengers (arriving 4,474,000; departing 4,490,000)
suburban transport: 6,334,500 passengers (arriving 3,066,200; departing 3,268,300)
national transport (within Azerbaijan): 2,558,700 passengers (arriving 1,272,400: departing 1,286,300)
international transport: 11,200 passengers (arriving 4,700; departing 6,500)

2) cost estimates based on Consultant's unit cost calculations

Annex 1.1-4

Technical Condition of Stations of Georgian Railway

1	2	3	4	5	6	7	8	9	10	11	12
Number	Name of station	Route	Distance to the next station listed (km)	Type of station (main function)	Category of station	Number of through tracks / length (m)	Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	Number of storage and other sidings / length (m)	Track condition	Available facilities for freight loading and unloading (dimension in m)	Condition of facilities for freight loading and unloading
1	Poti	**Poti - Tbilisi - Gardabani - (Baku)**	67.9 from Poti Port; 65.2 from Poti	Freight station	1	2 / 670 and 615 m	4 / 616 and around 400 m	28 / 520, 560, 675, 192, 96, 765, 475, 225, 225, 70, 69, 90, 150, 150, 140, 300, 300, 120, 422, 445, 620, 380, 252, 620, 290, 425, 288 and 355 m	poor to very poor	non-existent	-
2	Samtredia		61.0	Combination of the former seperated stations Samtredia and Samtredia 2: Marshalling yard / Freight station / Container terminal	Extra	2 / 5856 and 5322 m	16 / 916, 962, 867, 865, 874, 872, 994, 920, 891, 932, 900, 900, 958, 958, 976 and 829 m	37 / 694, 694, 825, 944, 828, 784, 849, 988, 962, 878, 859, 859, 892, 841, 878, 861, 844, 844, 856, 856, 803, 803, 734, 630, 563, 669, 664, 694, 165, 280, 128, 195, 120, 47, 50, 272 and 200 m	satisfactory to poor	2 warehouses (96x26; 216x30); 1 Covered loading ramp (90x18); 1 loading ramp (60x20); 3 areas for handling containers 260x16; 260x16; 160x25 for 20 ft containers); *compare Annex 1.1-13*	satisfactory to poor
3	Sestafoni		63.1	Freight station	1	2 / 402 and 679 m	2 / 558 and 444 m	10 / 506, 326, 330, 695, 760, 753, 770, 771, 220 and 85 m	satisfactory to poor	1 warehouse (60x18); 1 Covered loading ramp (36x22);	very poor
										1 area for handling containers (220x60); 1 elevated track for bottom discharge wagons (168)	satisfactory

Annex 1.1-4

Technical Condition of Stations of Georgian Railway

1	2	13	14	15	16	17	18	19	20		
Number	Name of station	Number of forwarded wagons in 1996	Number of received wagons in 1996 (incl. empty wagons)	Volume of forwarded freight traffic (tonnes) in 1996	Number of platforms / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers arriving in 1996	Number of passengers departing in 1996	Repair work to tracks and structures required or planned to be carried out / cost estimations made by GRZD (USD)		
									Tracks	Facilities for freight loading and unloading	Station buildings, platforms and other facilities for passenger traffic[1)]
1	Poti	24,097	28,367	1,429,061	2 / 600, 420	satisfactory	60,000	62,000	Rehabilitation / USD 48,700	1 storeroom for part load traffic (at present under construction); Construction of an area for handling 20 ft and 40 ft containers / USD 200,000	USD 40,000
2	Samtredia	695	561	37067	3 / 503, 577, 306 and 2 / 180 m each at the former station Samtredia 2	satisfactory	320,000	322,000	Rehabilitation / Millions of USD 2.5	Repairs to the craneway and the contact wire / USD 7,000 and 1,800; Purchase of 300 m cable for the crane; Purchase of 2 diesel fork-lift trucks (*see also Annex 1.1-13*)	USD 55,000
3	Sestafoni	594	585	37193	2 / 350, 240	good	200,000	205,000	Rehabilitation / Millions of USD 1.65	Repair of the contact wire of the crane / USD 2,400; Purchase of one diesel fork-lift truck; Repairs to the warehouse	USD 25,000

Annex 1.1-4

Technical Condition of Stations of Georgian Railway

1	2	3	4	5	6	7	8	9	10	11	12
Number	Name of station	Route	Distance to the next station listed (km)	Type of station (main function)	Category of station	Number of through tracks / length (m)	Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	Number of storage and other sidings / length (m)	Track condition	Available facilities for freight loading and unloading (dimension in m)	Condition of facilities for freight loading and unloading
4	Khashuri		44.1	Freight station	1	1 / 725 m	3 / 387, 306 and 250 m	9 / 885, 430, 410, 683, 683, 800, 760, 790 and 786 m	good to satisfactory	1 warehouse (37x13); 1 area for handling containers (170x16); 1 elevated track for bottom discharge wagons (115)	very poor
5	Gori		73.3	Passenger station / Container terminal	2	2 / 850 and 930 m	2 / 854 m each	7 / 930, 900, 245, 320, 445, 448 and 448 m	satisfactory to pooor	1 warehouse (45x24); 1 area for handling containers (100x16); *compare Annex 1.1-12*	very poor
										1 covered loading ramp; 1 loading ramp (80x18); 1 elevated track for bottom discharge wagons (90)	poor
6	Tbilisi Tov.		2.3	Freight station / Container terminal	1	2 / around 900 m each	2 / 879 and 850 m	24 / 728, 807, 752, 752, 72, 350, 188, 262, 304, 332, 206, 290, 73, 80, 345, 248, 276, 280, 342, 570, 90, 106, 72 and 136 m	satisfactory to very poor	3 covered loading areas (60x24; 60x24; 75x24)	satisfactory
										1 loading ramp (100x20); 1 area for handling containers (430x16); 1 area for handling 20 ft containers (*compare Annex 1.1-14*)	poor

Annex 1.1-4

Technical Condition of Stations of Georgian Railway

1	2	13	14	15	16	17	18	19	20		
Number	Name of station	Number of forwarded wagons in 1996	Number of received wagons in 1996 (incl. empty wagons)	Volume of forwarded freight traffic (tonnes) in 1996	Number of platforms / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers arriving in 1996	Number of passengers departing in 1996	Repair work to tracks and structures required or planned to be carried out / cost estimations made by GRZD (USD)		
									Tracks	Facilities for freight loading and unloading	Station buildings, platforms and other facilities for passenger traffic[1)]
4	Khashuri	485	908	16,420	2 / 720, 640	good	300,000	300,000	Rehabilitation USD 40,000	Repairs to the warehouse (roof and doors) / USD 2,000; Installation of the new crane (already available) / USD 8,000; Repair of the craneway and the contact wire / USD 5,100 and 3,000;	USD 16,000
5	Gori	192	1169	6951	2 / 570, 500	satisfactory	180,000	185,000	Rehabilitation / Millions of USD 2.3	Repairs to the warehouse / USD 2,500; Repairs to the crane and the craneway / USD 2,000 each (*see also Annex 1.1-12*) Repairs to the roof of the covered loading ramp / USD 500	USD 16,000
6	Tbilisi Tov.	492	3433	14728	1/ 150	satisfactory	20,000	20,000	Rehabilitation / Millions of USD 2.1	Purchase of 6 diesel fork-lift trucks; Restoration of the loading areas / USD 5,000 Replacement of 3 cranes / USD 40,000; Repairs to craneways / USD 15,000; Repair and paint of the gantry crane / USD 10,000 (*see also 1.1-14*)	USD 4,000

Annex 1.1-4

Technical Condition of Stations of Georgian Railway

1	2	3	4	5	6	7	8	9	10	11	12
Number	Name of station	Route	Distance to the next station listed (km)	Type of station (main function)	Category of station	Number of through tracks / length (m)	Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	Number of storage and other sidings / length (m)	Track condition	Available facilities for freight loading and unloading (dimension in m)	Condition of facilities for freight loading and unloading
7	Tbilisi Pass.		6.3	Passenger station	Extra	2 / 655 and 605 m	not available	18 / 605, 575, 575, 570, 430, 460, 480, 710, 585, 380, 310, 170, 90, 50 180, 110, 80 and 50 m	satisfactory to poor	non-existent	-
8	Tbilisi Usl.		0.8	Branch-off station / Freight station	Extra	2 / 554 and 502 m	6 / 857, 316, 857, 316, 555 and 639 m	9 / 355, 445, 428, 366, 590, 640, 726, 428 and 400 m	good to satisfactory	not available	-
9	Tbilisi Sort.		20.2	Marshalling yard	1	2 / 860 and 876 m	23 / 812, 790, 800, 816, 878, 865, 865, 323, 823, 877, 824, 828, 828, 827, 827, 963, 914, 938, 938, 856, 856, 760 and 760 m	7 / 855, 871, 862, 862, 892, 804 and 852 m	satisfactory to very poor	non-existent	-
10	Gardabani		28.5	Border station	2	2 763 and 1010 m	not available	4 / 813, 835, 815 and 607 m	good to satisfactory	non-existent	-
11	Batumi	**Batumi - Samtredia**	105.6 to Samtre-dia	Combination of the former seperated passenger and freight station (under rebuilding since 1996)	Extra	2 / 1285 and 1191 m	8 / 953, 747, 747, 813, 799, 590, 455 and 860 m	10 / 1049, 426, 587, 519, 523, 809, 828, 849, 200 and 282 m	poor to very poor	1 warehouse (76x24); 1 covered loading ramp (106x18); 1 loading ramp (46x20); 1area for handling containers (215x16); 1 elevated track for bottom discharge wagons (180)	satisfactory to poor

Annex 1.1-4

Technical Condition of Stations of Georgian Railway

1	2	13	14	15	16	17	18	19	20		
Number	Name of station	Number of forwarded wagons in 1996	Number of received wagons in 1996 (incl. empty wagons)	Volume of forwarded freight traffic (tonnes) in 1996	Number of platforms / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers arriving in 1996	Number of passengers departing in 1996	Repair work to tracks and structures required or planned to be carried out / cost estimations made by GRZD (USD)		
									Tracks	Facilities for freight loading and unloading	Station buildings, platforms and other facilities for passenger traffic[1)]
7	Tbilisi Pass.	-	-	-	3 / 700, 600, 570	good	1,200,000	1,200,000	Rehabilitation / Millions of USD 2.2	-	USD 120,000 (rehabilitation started in 1987; but, has not been finished yet)
8	Tbilisi Usl.	608	5,876	28,558	2 / 420 each	good	120,000	120,000	Rehabilitation / Millions of USD 4.2	-	USD 80,000
9	Tbilisi Sort.	92	889	4,634	1 / 240	satisfactory	75,000	75,000	Rehabilitation / Millions of USD 4.5	-	USD 4,000
10	Gardabani	31	31	1,345	2 / 430, 250	satisfactory	50,000	50,000	Rehabilitation / Millions of USD 1.85	-	USD 8,000
11	Batumi	10,619	14,258	668,704	2 /395, 340 (old passenger staion)	satisfactory	250,000	235,000	Rehabilitation / Millions of USD 41	Purchase of 2 diesel fork-lift trucks; Repairs to the roof of the warehouse / USD 2,000; Repairs to the craneway, asphalt work; Construction of a new area for handling 20 ft and 40 ft containers / USD 70,000 (project already exists)	USD 16,000 (new buildings and facilities have been under construction since 1996: USD 220,000)

Annex 1.1-4

Technical Condition of Stations of Georgian Railway

1	2	3	4	5	6	7	8	9	10	11	12
Number	Name of station	Route	Distance to the next station listed (km)	Type of station (main function)	Category of station	Number of through tracks / length (m)	Additional tracks for operational purposes (train formation and splitting up; arrival and departure tracks) / length (m)	Number of storage and other sidings / length (m)	Track condition	Available facilities for freight loading and unloading (dimension in m)	Condition of facilities for freight loading and unloading
12	Marneuli	**Tbilisi - Sadakhlo - (Yerevan)**	29.9 from Tbilisi Usl.	Freight station	2	1 / 448 m	2 / 574 and 280 m	5 / 575, 756, 546, 548 and 574 m	satisfactory to very poor	1 elevated track for bottom discharge wagons (168)	satisfactory
13	Sadakhlo		59.1 from Tbilisi Usl.	Border station	4	1/ 467 m	not available	4 / 534, 534, 1050 and 1050 m	satisfactory to very poor	non-existent	-

Annex 1.1-4

Technical Condition of Stations of Georgian Railway

1	2	13	14	15	16	17	18	19	20		
Number	Name of station	Number of forwarded wagons in 1996	Number of received wagons in 1996 (incl. empty wagons)	Volume of forwarded freight traffic (tonnes) in 1996	Number of platforms / length (m)	Condition of station building and facilities for passenger traffic	Number of passengers arriving in 1996	Number of passengers departing in 1996	Repair work to tracks and structures required or planned to be carried out / cost estimations made by GRZD (USD)		
									Tracks	Facilities for freight loading and unloading	Station buildings, platforms and other facilities for passenger traffic[1)]
12	Marneuli	113	1,188	5,524	2 / 100 each	satisfactory	25,000	25,000	Rehabilitation / Millions of USD 1.9	Construction of an area for handling containers, a transshipment yard for heavy goods, a warehouse and a loading ramp might be necessary in future.	USD 8,000
13	Sadakhlo	490	40	34,178	2 / 100, 150	satisfactory	15,000	15,000	Rehabilitation / Millions of USD 1.82	-	USD 8,000

[1)] General repairs; no specification has been provided by GRZD

Annex 1.1-5

Analysis of Existing Terminals for Combined Traffic - Abovian

Name of railway	Railway of Armenia
Name of station	Abovian
Handling devices	
cranes (number/lifting capacity)	1 gantry crane (KK-20)/20 tonnes/span 16 m/never completely assembled *in addition 2 gantry cranes/10 tonnes each*
present condition/availability	never fit for use
length of craneway	80 m
other devices for container handling	
number of tracks under the crane	1
present condition of tracks	very poor
number of lanes (for container trucks) under the crane	
Storage facilities	
storage area	800 m^2/not paved/in very poor condition
warehouse	non-existent
Location in the railway network	not well situated; transfer of wagons from Masis necessary
Links with the road network	
location in the network	long distance from Yerevan
condition of road access	very poor
Fencing	non-existent
Lighting installation	non-existent
Communication and data processing technology	not available
Additional remarks	
Main deficiencies/overall assessment/	Generally, the terminal is not suitable for container handling at all./Taking into account the present condition and the future development according to the forecast, it is considered unwise to make any proposal to complete and to rehabilitate this terminal.

Volume of container traffic included in the figures for Karmir Blur

Annex 1.1-6

Analysis of Existing Terminals for Combined Traffic - Gyumri

Name of railway	Railway of Armenia
Name of station	Gyumri
Handling devices	
cranes (number/lifting capacity)	1 gantry crane with 2 jibs (KK-32)/ 32 tonnes/span 25 m *in addition 2 gantry cranes/10 tonnes each/partly cannibalised*
present condition/availability	not in working order/partly cannibalised/in need of general overhaul
length of craneway	80 m
other devices for container handling	1 spreader/20 tonnes/not in working order
number of tracks under the crane	1
present condition of tracks	very poor
number of lanes (for container trucks) under the crane	1 beside the storage area/craneway
Storage facilities	
storage area	900 m^2/paved/in acceptable condition
warehouse	non-existent
Location in the railway network	1.5 km away from the Gyumri railway station
Links with the road network	
location in the network	long distance to trunk roads
condition of road access	very poor, not acceptable
Fencing	only partly existing
Lighting installation	non-existent
Communication and data processing technology	since 1988 (earthquake) out of order
Additional remarks	office building destroyed by the earthquake
Main deficiencies/overall assessment	Present condition of the handling devices; access to the road network/Taking into account the present condition and the projected traffic level, the rehabilitation of the container terminal cannot be recommended.

Volume of container traffic (number of containers handled)

Type of container		1990	1991	1992	1993	1994	1995	1996 (Jan-June)
3 and 5 t[1)]	forwarded	5,302	3,231	482	0	0	0	0
	received	5,513	3,257	464	0	0	0	0
TEU (20')	forwarded	563	120	110	0	0	0	3
	received	1,265	328	44	0	70	58	21
in total	forwarded	5,865	3,411	591	0	0	0	3
	received	6,778	3,585	508	0	70	58	21

[1)] one 5 t container is counted as two 3 t containers

Annex 1.1-7

Analysis of Existing Terminals for Combined Traffic - Karmir Blur

Name of railway	Railway of Armenia
Name of station	Karmir Blur
Handling devices	
cranes (number/lifting capacity)	2 gantry cranes (KK-20)/20 tonnes/span 25 m *in addition 3 gantry cranes/5 tonnes each*
present condition/availability	1 crane in acceptable condition; 1 crane not in working order, in need of general overhaul/availability of the functional crane around 80%
length of craneway	224 m
other devices for container handling	1 spreader (20 tonnes) 40' containers are handled by railway revolving crane
number of tracks under the crane	1
present condition of tracks	poor
number of lanes (for container trucks) under the crane	1 beside the storage area/craneway
Storage facilities	
storage area	5,700 m^2/mainly paved/acceptable condition
warehouse	non-existent
Location in the railway network	good/close to the Masis marshalling yard
Links with the road network	
location in the network	short distance to trunk roads and main destinations
condition of road access	acceptable
Fencing	existing; only light repair necessary
Lighting installation	not in working order
Communication and data processing technology	only telephone connection; however, only sometimes functional
Additional remarks	It must be decided whether the second crane should be scrapped or overhauled.
Main deficiencies/overall assessment	The supply of energy must be stabilised; an adequate communication system installed./The terminal is able to handle 20' containers without any investment (but only in daylight).

Volume of container traffic including Abovian (number of containers handled)

Type of container		1990	1991	1992	1993	1994	1995	1996 (Jan-June)
3 and 5 t[1)]	forwarded	58,557	29,632	5,763	83	13	0	0
	received	64,976	39,462	6,393	80	33	12	0
TEU (20' and 40')	forwarded	6,847	2,158	1,177	78	135	180	151
	received	12,518	3,623	1,958	657	986	817	776
in total	forwarded	65,404	43,085	6,940	161	148	180	151
	received	77,494	31,796	8,351	737	1,019	829	776

[1)] one 5 t container is counted as two 3 t containers

Annex 1.1-8

Analysis of Existing Terminals for Combined Traffic - Vanadzor

Name of railway	Railway of Armenia
Name of station	Vanadzor
Handling devices	
cranes (number/lifting capacity)	1 gantry crane (KK-20)/20 tonnes/span 25 m
present condition/availability	poor/50%/the electrical parts are especially in need of general overhaul
length of craneway	75 m
other devices for container handling	1 spreader/20 tonnes
number of tracks under the crane	2
present condition of tracks	very poor
number of lanes (for container trucks) under the crane	1 beside the storage area/craneway
Storage possibilities	
storage area	1,600 m^2/originally paved/now in very poor condition
warehouse	2 warehouses existing/in acceptable condition
Location in the railway network	short distance to the railway station Vanadzor
Links with the road network	
location in the network	short distance to trunk roads
condition of road access	acceptable
Fencing	partly existing
Lighting installation	existing; but out of order
Communication and data processing technology	only telephone connection
Additional remarks	
Main deficiencies/overall assessment	The supply of energy must be stabilised. The crane is in need of general overhaul./The present condition permits the handling of a small number of containers only. The decision on rehabilitation depends on the future traffic level.

Volume of container traffic (number of containers handled)

type of container		1990	1991	1992	1993	1994	1995	1996 (Jan-June)
3 and 5 t[1]	forwarded	12,383	6,083	1,205	0	0	0	0
	received	9,526	5,738	836	0	0	0	0
TEU (20')	forwarded	1,856	550	339	0	0	0	0
	received	1,362	362	150	0	0	6	45
in total	forwarded	14,239	6,633	1,544	0	0	0	0
	received	10,888	6,100	986	0	0	6	45

[1)] one 5 t container is counted as two 3 t containers

Annex 1.1-9

Analysis of Existing Terminals for Combined Traffic - Kishli-Baku

Name of railway	Azerbaijan State Railways
Name of station	Kishli-Baku
Handling devices	
cranes (number/lifting capacity)	one 20 t Valmet mobile container crane *in addition various other cranes with a lifting capacity up to 5 tonnes*
present condition/availability	in satisfactory condition/availability around 80%
length of craneway	n.a.
other devices for container handling	non-existent
number of tracks	15 arrival and shunting sidings 7 shunting sidings 19 sidings for handling goods 4 train formation sidings 2 storage sidings
present condition of tracks	acceptable
number of lanes (for container trucks) under the crane	not. applicable
Storage facilities	
storage area	paved/acceptable condition
warehouse	existing/usable
Location in the railway network	good/close to the marshalling yard
Links with the road network	
location in the network	long distance to the main destinations
condition of road access	acceptable
Fencing	existing; only light repair necessary
Lighting installation	existing; however, only partly functional
Communication and data processing technology	only telephone connection
Additional remarks	The use of the container terminal at Baku Port for the Trans-Caucasian-Logistic-Express to Batumi/Poti is recommended. *Only at the port, 40' containers can be handled (cranes with a lifting capacity of 40 t).*
Main deficiencies/overall assessment	The terminal is able to handle 20' containers without any investment (but only in daylight).

Volume of container traffic (number of containers handled)

Type of container		1995[1] (January - July)	1996 (January - July)
3 and 5 t[2]	forwarded	1,154	2,605
	received	350	516
TEU (20')	forwarded	196	20
	received	82	202
in total	forwarded	1350	2625
	received	432	708

[1] including Khirdalan

[2] one 5 t container is counted as two 3 t containers

Annex 1.1-10

Analysis of Existing Terminals for Combined Traffic - Gyandsha

Name of railway	Azerbaijan State Railways
Name of station	Gyandsha
Handling devices	
cranes (number/lifting capacity)	4 gantry cranes /10 tonnes each *in addition various other cranes with a lifting capacity up to 10 tonnes/most of them should be scrapped*
present condition/availability	satisfactory to poor/50%
length of craneway	around 150 m
other devices for container handling	not available
number of tracks	15 arrival and departure tracks 3 shunting sidings 2 storage sidings for passenger trains 2 storage sidings for freight trains 2 siding for train formation 1 siding for unloading cement
present condition of tracks	poor
number of lanes (for container trucks) under the crane	1
Storage facilities	
storage area	existing
warehouse	non-existent
Location in the railway network	good
Links with the road network	
location in the network	acceptable
condition of road access	poor
Additional remarks	From April 1997, the Trans-Caucasian-Logistic-Express shall have a stop at Gyandsha for loading and unloading.
Main deficiencies/overall assessment	This small terminal is not properly equipped for handling 20' containers. Two cranes have to work synchronously to lift together one 20' container. In total, the terminal is very poor equipped. / The present condition permits the handling of a small number of containers only. The decision on rehabilitation depends on the traffic forecasted.

Volume of container traffic (number of containers handled)

Type of container		1995 (January - July)	1996 (January - July)
3 and 5 t[1)]	forwarded	193	129
	received	91	24
TEU (20')	forwarded	170	0
	received	12	1
in total	forwarded	363	129
	received	103	25

[1)] one 5 t container is counted as two 3 t containers

Annex 1.1-11

Analysis of Existing Terminals for Combined Traffic - Khirdalan

Name of railway	Azerbaijan State Railways
Name of station	Khirdalan
Handling devices	
cranes (number/lifting capacity)	2 gantry cranes with spreaders/20 tonnes each *in addition 1 gantry crane/10 tonnes*
present condition/availability	in poor condition; partly cannibalised/The terminal and the cranes have not used since August 1995.
length of craneway	around 200 m
other devices for container handling	one 20 t Valmet mobile container crane/not in working order
number of tracks	one track under the crane each
present condition of tracks	very poor
number of lanes (for container trucks) under the crane	2 beside the storage area/craneway each
Storage facilities	
storage area	originally paved/now in very poor condition (large potholes, steel reinforcement juts out of the concrete); not usable
warehouse	non-existent
Location in the railway network	good; around 2 km to the marshalling yard Baladshary
Links with the road network	
location in the network	unfavourable location with respect to the city
condition of road access	poor
Fencing	only partly existing, damaged
Lighting installation	existing; however, only partly functional
Communication and data processing technology	non-existent
Additional remarks	
Main deficiencies/overall assessment	The terminal cannot be used in the present condition. The estimated costs for the rehabilitation of the road access, the storage area, the tracks and the fencing (wall) are about US$ 1.2 million. / Taking into account the present condition, the unfavourable location and the bad climatic conditions (exposed to stormy winds weather, force more than 6, and this during about 240 days per year), the rehabilitation of the terminal cannot be recommended.

Volume of container traffic (number of containers handled)

The terminal has not been used since August 1995.

Detailed figures for the previous years could not be provided by AGZD.

Annex 1.1-12

Analysis of Existing Terminals for Combined Traffic - Gori

Name of railway	Georgian Railways
Name of station	Gori
Handling devices	
cranes (number/lifting capacity)	1 gantry cranes/10 tonnes
present condition/availability	not in working order, cannibalised
length of craneway	150 m
other devices for container handling	non-existent
number of tracks under the crane	2
present condition of tracks	very poor, should be renewed
number of lanes (for container trucks) under the crane	combined with the storage area
Storage facilities	
storage area	around 750 m^2/ not paved, very poor condition
warehouse	available/in poor condition, partly damaged and cannibalised
Location in the railway network	good, short distance to the freight station
Links with the road network	
location in the network	short distance to trunk roads and main destinations
condition of road access	very poor; not paved
Fencing	non-existent
Lighting installation	existing; however not in working order, in need of general overhaul
Communication and data processing technology	not available
Additional remarks	The terminal and the crane have not used since 1994.
Main deficiencies/overall assessment	In the present condition, the terminal cannot be used. It is not possible to handle 20' containers there./ Taking into account the present condition and the traffic forecasted, the rehabilitation of the terminal (including the installation of a crane with a lifting capacity of 20 t) cannot be recommended.

Volume of container traffic (number of containers handled)

The figures could not be provided by GRZD.

Annex 1.1-13

Analysis of Existing Terminals for Combined Traffic - Samtredia 2

Name of railway	Georgian Railways
Name of station	Samtredia 2
Handling devices	
cranes (number/lifting capacity)	1 gantry cranes/20 tonnes *in addition 3 gantry cranes/3 tonnes, 5 tonnes respectively*
present condition/availability	all cranes are not in working order, cannibalised (for instance, 250 m cable are missing), the 20 t crane needs a new electric motor
length of craneway	160 m
other devices for container handling	spreader (20 tonnes); not functional
number of tracks under the crane	1 (under the 20 t crane)
present condition of tracks	very poor, should be renewed
number of lanes (for container trucks) under the crane	combined with the storage area
Storage facilities	
storage area	around 2,000 m^2/ not paved /very poor condition
warehouse	available/in poor condition, partly damaged and cannibalised
Location in the railway network	good, short distance to the marshalling yard
Links with the road network	
location in the network	short distance to trunk roads and main destinations
condition of road access	in satisfactory condition
Fencing	existing; however, partly destroyed
Lighting installation	non-existent
Communication and data processing technology	not available
Additional remarks	The terminal and the cranes have not used since 1994.
Main deficiencies/overall assessment	In the present condition, the terminal cannot be used. The envisaged inclusion of this terminal in the Trans-Caucasian-Logistic-Express would require the rehabilitation of the 20 t crane or the use of a mobile container crane.

Volume of container traffic (number of containers handled)

Type of container		1990	1991	1992	1993	1994	1995	1996
in total	forwarded	2,523	3,032	432	136	*	*	not available
	received	2,429	5,048	566	23	*	*	not available

[1] one 5 t container is counted as two 3 t containers

* No container traffic, due to the situation in Chechnya.

During "good years", about fifty 3 and 5 t containers were handled per day; in addition about twenty 20' containers

More detailed figures could not be provided by GRZD.

Annex 1.1-14

Analysis of Existing Terminals for Combined Traffic - Tbilisi Tov. (Freight Station)

Name of railway	Georgian Railways
Name of station	Tbilisi Tov. (Freight Station)
Handling devices	
cranes (number/lifting capacity)	2 gantry cranes/20 tonnes each *in addition 4 gantry cranes/5 tonnes each*
present condition/availability	1 crane in acceptable condition, ready for operation; 1 crane not in working order, in need of general overhaul / availability of the functional crane around 70%; only one 5 t crane ready for operation
length of craneway	270 m
other devices for container handling	spreader (20 tonnes)
number of tracks under the crane	2
present condition of tracks	poor
number of lanes (for container trucks) under the crane	2 beside the storage area/craneway
Storage facilities	
storage area	around 5,000 m^2/ originally paved /very poor condition
warehouse	available
Location in the railway network	good
Links with the road network	
location in the network	short distance to trunk roads and main destinations
condition of road access	very poor
Fencing	existing, repair work required
Lighting installation	available; interruptions due to frequent power cuts
Communication and data processing technology	only telephone connection; however, only sometimes functional
Additional remarks	It must be decided whether the second 20 t crane should be scrapped or overhauled.
Main deficiencies/overall assessment	The supply of energy must be stabilised; an adequate communication system installed./The terminal is able to handle 20' containers without any investment.

Volume of container traffic (number of containers handled)

Type of container		1990	1991	1992	1993	1994	1995	1996
in total	forwarded	7,394	4,689	2,164	1,067	*	*	not available
	received	17,102	4,557	3,399	1,132	*	*	not available

[1] one 5 t container is counted as two 3 t containers

* No container traffic, due to the situation in Chechnya.

In 1996, about 60 containers were handled per month, mainly 3 and 5 t containers.

During "good years", about 3,000 to 3,500 containers were handled per month; nearly 50% were 20' containers

More detailed figures could not be provided by GRZD.

Annex 1.1-15

Overview of ARM electric locomotives

November 1996

Depot	Type of locomotive	amount			**Problems**		
		generally	under operation/ in reserve	out of order generally/in the depot/in the factory	**waiting for rejection**	**waiting for repair TR 3**	**waiting for repair KR1**
Sanain	VL-10	6	4 / 0	2 / 2 / 0			2
Gyumri	VL-10	38	11 / 5	22 / 4 / 6 1-Lwow, 2-Tuapse, 2-Tbilisi, 1-Sestafoni	15		7
Yerevan	VL-8	47	6 / 18	23 / 1 / 7 3-Moscow/Perovo 4-KRL	15		8
Total	**VL-8**	**47**	**6 / 18**	**23 / 1 / 7**	**15**		**8**
	VL-10	**44**	**15 / 5**	**24 / 6 / 6**	**15**		**9**

KRL - KrasnoLimanLocomotiveDepot

Annex 1.1-16

Inventory of freight wagons stock of ARM

November 1996

type of wagon	number
covered wagons	203
open wagons	205
tanks	30
platforms/flats	352
others	421
Subtotal	**1211**
private wagons[1]	367
Total	**1578**

[1] 1 covered, 44 flats, 96 tanks, 14 refrigerators, 212 others

Annex 1.1-17

Wagon repair performances

1996

	DR-1	DR-1	OR		OR	TR-2	TR-2
month	Yerevan	Gyumri	Gyumri	Masis	Nursus	Gyumri	Masis
1	32		23			10	
2	17		12	24			
3	27		12	49		17	
4	34		28	28		12	
5	43		18	20			
6	44		24	11	6	76	92
7	44		190	38	4	89	88
8	28		29	36	6	43	89
9	34	28	38	32	6		93
10		34					
sub-total	**303**	**62**	**374**	**238**	**22**	**247**	**362**
Total		**365**			**634**		**609**

Annex 1.1-18

Analysis
about break downs of locomotive components of ARM

January - October 1996

component	part in %
compressor of the engine	7,1 %
rheostats	9,2 %
sliding contacts	8,1 %
traction motor bloc	28,5 %
speedometers	27 %
ventilator for the engine	6,3 %
compressor KTB	9,6 %
chamber BV	4,1 %

Annex 1.1-19

Daily damaged wagon stock of ARM

31.10.1996

type of wagon	daily damaged
covered	1,000
platforms/flats	320
coal	864
refrigerators	1
others	8
container-wagons	45
cement	100
20´ container	60
cereal	4
Total	**2,402**

Annex 1.1-20

Comparison of the existing wagon stock with the average of the daily damaged stock on ARM rail net

November 1996

type of wagon	existing volume	damaged wagons 31.10.1996	share in per cent
covered	1,218	1,000	82
platforms/flats	402	320	79.6
coal	997	864	86.7
tanks	47	0	0
refrigerators	18	1	5.6
others	31	8	25.8
container-wagons	136	105	77.2
cement	236	100	42.4
cereal	127	4	3.1
Total	**3,212**	**2,402**	**74.8**

Annex 1.1-21

Maintenance volume of the overall wagon stock of ARM

Kind of wagon	existing number	number in operation	DR-period (years)	DR-Volume of existing stock	DR-Volume of operating stock	KR-period (years)	KR-Volume of existing stock	KR-Volume of available stock
covered wagons	1,218	218	2	548	98	10	122	22
open wagons	402	133	1	352	116	8	50	17
tanks	47	47	1	43	43	11	4	4
platforms/flats	402	82	1	378	77	17	24	5
refrigerators	18	17	1	16	15	10	2	2
cement	236	136	2	108	62	11	21	12
cereal	127	123	2	107	62	11	12	11
container	136	31	1	122	28	10	14	3
Subtotal	**3,212**	**810**		**1,674**	**501**		**249**	**76**

Annex 1.1-22

Brief technical description of the most important electric locomotives of the Caucasian railways

type of locomotive	VL-8	VL-10	VL-11
service weight	184 tons	184 tons	180 tons
number of axles	8	8	8
axle-load	23 tons	23 tons	22.5 tons
number of traction engines	8	8	8
installed power per traction engine	525 kW	650 kW	670 kW
power per hour	4,200 kW	5,200 kW	5,360 kW
constant power	3,660 kW	4,530 kW	4,600 kW
traction per hour	352 kN	397.6 kN	387 kN
constant traction	303 kN	324.8 kN	314 kN
designed speed	80 km/h	100 km/h	100 km/h
speed at constant power	44.3 km/h	51.2 km/h	51.2 km/h
speed at power per hour	42.6 km/h	48.7 km/h	48.7 km/h
length	27.52 m	32.84 m	32.88 m
diameter of driving wheel	1,200 mm	1,250 mm	1,250 mm

Annex 1.1-23

Age structure
of the electric locomotives of the Caucasian railways
- 1996 -

type of locomotive	age in years	number ARM	number AGZD	number GRZD	Total	%
VL-8	35 and more	11	92	11	114	36
	34 - 30	20	91	66	177	56
	29 - 26	16		8	24	8
VL-10	29 - 26			41	41	28
	25 - 21			44	44	30
	20 - 13	44		18	62	42
VL-11	16 - 11			12	12	14
	10 - 6		37	29,5	66,5	78
	5-1		6	1	7	8

Annex 1.2-1

Balance sheets Armenian Railways, main sphere (transport activities)

	End 1993 10^6 Dram	End 1994 10^6 Dram	End 1995 10^6 Dram	End 1996 10^6 Dram	End 1993 10^6 US$*	End 1994 10^6 US$*	End 1995 10^6 US$*	End 1996 10^6 US$*
Assets								
Long term assets	**237,3**	**385,9**	**5.614,3**	**7.242,8**	**3,16**	**0,95**	**13,97**	**16,28**
Major fixed assets: acquis. value	371,2	526,3	8.113,9	11.749,6	4,95	1,30	20,18	26,40
Major fixed assets: depreciation	133,9	140,4	2.499,6	4.506,8	1,79	0,35	6,22	10,13
Major fixed assets: residual value	237,3	385,9	5.614,3	7.242,8	3,16	0,95	13,97	16,28
Mobile equipment								
Uncompleted fixed assets								
Financial assets								
Short term assets	**19,1**	**1.426,7**	**2.082,5**	**2.859,3**	**0,25**	**3,52**	**5,18**	**6,43**
Inventory of materials	0,7	101,8	478,2	604,5	0,01	0,25	1,19	1,36
Minor fixed assets: acquis. val.		46,9	95,1	120,4				
Minor fixed assets: depreciation	0,0	23,5	46,3	58,5	0,00	0,06	0,12	0,13
Minor fixed assets: residual val.	-0,0	23,4	48,9	61,9	-0,00	0,06	0,12	0,14
Other + omission	8,5	-13,3		6,9	0,11	-0,03		0,02
Accounts receivable	1,6	1.286,1	1.485,2	2.175,7	0,02	3,17	3,69	4,89
Advance payments	6,3		3,0	2,3	0,08		0,01	0,01
Cash	2,1	28,7	67,3	8,0	0,03	0,07	0,17	0,02
Losses								
Balance	**256,4**	**1.812,6**	**7.696,8**	**10.102,1**	**3,42**	**4,47**	**19,15**	**22,70**
Liabilities								
Equity	**240,6**	**1.347,3**	**7.302,7**	**9.043,4**	**3,21**	**3,32**	**18,17**	**20,32**
Share capital	238,7	417,1	5.848,2	7.486,2	3,18	1,03	14,55	16,82
Fund for special purposes (reserves)	0,1	31,9	14,2	55,5	0,00	0,08	0,04	0,12
Other funds	1,8	898,3	1.440,4	1.501,7	0,02	2,22	3,58	3,37
Long-term liabilities	**1,5**				**0,02**			
Short- and medium-term liabilities	**14,3**	**465,3**	**394,1**	**1.058,7**	**0,19**	**1,15**	**0,98**	**2,38**
Short-term debts to banks				23,9				0,05
Bank loans for the staff								
Accounts payable:								
Suppliers	2,6	407,5	246,8	191,1	0,03	1,00	0,61	0,43
Salaries	0,8	17,7	33,6	34,6	0,01	0,04	0,08	0,08
Social insurance	0,2	6,2	13,8	17,7	0,00	0,02	0,03	0,04
Life and property insurance			2,9				0,01	
Non-governmental organisations								
Taxes	0,9	2,9	27,3	787,5	0,01	0,01	0,07	1,77
Various creditors	3,6	31,0	69,7	3,9	0,05	0,08	0,17	0,01
Provisions								
Reserve								
Various short-term liabilities	6,3				0,08			
Balance	**256,4**	**1.812,6**	**7.696,8**	**10.102,1**	**3,42**	**4,47**	**19,15**	**22,70**

Annex 1.2-1

Official re-evaluation of fixed assets:

For balance sheet 31/12/93:	have been multiplied by	
- items acquired before 1991	150	times
- items acquired in 1991	36	times
- items acquired in 1992	8	times
- items acquired in 1993	1	time

For balance sheet 31/12/95:		
- all items	25	times

Exchange rates	Dram/US$
End 1993	75,0
End 1994	405,5
End 1995	402,0
End 1996	445,0

Annex 1.2-2

Acquisition value of the assets of Armenian Railways at the end of 1994 and 1995, at their respective values

Category	Acquisition value in Million Dram	
	End of 1994	End of 1995
Buildings	32.3	788.9
Permanent ways	341.3	4,936.5
Electric and transmission cables and installations	9.0	223.3
Machinery and equipment	22.0	627.4
Rolling stock	35.8	1,239.4
Tools and inventory	0.5	25.6
Other assets	85.4	272.8
Total	526.3	8,113.9
= in 1,000 US$ (approx.)	1,298	20,183

Annex 1.2-3

Armenian Railways, main sphere (transport activities)

Profit and loss statements

	1993 Million Rubles		1994 Million Dram		1995 Million Dram		1996 Million Dram	
	+	-	+	-	+	-	+	-
Gross receipts (main activities)	4.471,2		2.390,9		4.334,1		3.972,9	
Value added tax						616,6		573,7
Costs (main activities)*		4.750,6		2.215,9		3.704,3		3.702,2
Profit (main activities)		-279,3		175,0		13,2		-303,0
	4.471,2	4.471,2	2.390,9	2.390,9	4.334,1	4.334,1	3.972,9	3.972,9
Profits and losses side activities	580,0	207,5	10,9	66,1	0,0			
Net profit side activities		372,5		-55,2		0,0		
	580,0	580,0	10,9	10,9	0,0	0,0		
Total profit	93,1		119,8		13,2		-303,0	
Distribution:								
State (profit tax)		67,0		35,5				
"Accumulation fund"				40,9				
"Consumption fund"				10,0				
Pension fund				18,0				
Other uses		26,1		15,5		15,5		
* With repair costs as planned, not actual; if repair costs are taken at their actual expenses, total costs are only		4.350,6		1.486,5		2.765,1		3.107,8
and total profit is then	493,1		849,2		952,4		291,4	

Conversion to US$

Average parity per US$:
for 1993: 1.770 Ruble | for 1994: 290 Dram | for 1995: 406 Dram | for 1996 413,7 Dram

	1993 1000 US$		1994 1000 US$		1995 1000 US$		1996 1000 US$	
	+	-	+	-	+	-	+	-
Gross receipts (main activities)	2.526,7		8.248,7		10.679,3		9.602,5	
Value added tax						1.519,3		1.386,6
Costs (main activities)*		2.684,6		7.644,9		9.127,4		8.948,3
Profit (main activities)		-157,9		603,9		32,6		-732,4
	2.526,7	2.526,7	8.248,7	8.248,7	10.679,3	10.679,3	9.602,5	9.602,5
Profits and losses side activities	327,8	117,3	37,6	228,0	0,0			
Net profit side activities		210,5		-190,5		0,0		
	327,8	327,8	37,6	37,6	0,0	0,0		
Total profit	52,6		413,4		32,6		-732,4	
* With repair costs as planned, not actual; if repair costs are taken at their actual expenses, total costs are only		2.458,5		5.128,4		6.813,2		7.511,6
and total profit is then	278,7		2.929,8		2.346,8		704,3	

Annex 1.2-4

Armenian Railways. Transport and revenue statistics, 1993 - 1996

	Unit	1993	1994	1995	1996
Goods transport					
Total performance	10^3 tkm	450.900	n.a.	n.a.	351.000
Tonnes transported	10^3 t	2.682,5	n.a.	n.a.	1.710,7
Revenues		10^6 Ruble	10^6 Dram	10^6 Dram	10^6 Dram
		2.463,0	1.400,0	3.101,8	2.606,2
Revenues, converted to US$		1,000 US$	1,000 US$	1,000 US$	1,000 US$
		1.391,8	4.830,0	7.642,9	6.299,0
Portion of costs attributed to		10^6 Ruble	10^6 Dram	10^6 Dram	10^6 Dram
goods transport		2.265,0	1.589,8	2.994,8	2.810,2
converted to US$		1,000 US$	1,000 US$	1,000 US$	1,000 US$
		1.280,0	5.484,8	7.379,2	6.792,1
Passenger transport					
Total performance	10^3 pass.km	435.200	n.a.	n.a.	84.200
Revenues		10^6 Ruble	10^6 Dram	10^6 Dram	10^6 Dram
		378,0	134,0	151,8	103,6
Revenues, converted to US$		1,000 US$	1,000 US$	1,000 US$	1,000 US$
		213,6	462,3	374,0	250,4
Portion of costs attributed to		10^6 Ruble	10^6 Dram	10^6 Dram	10^6 Dram
passenger transport		1.535,0	280,6	530,8	422,0
converted to US$		1,000 US$	1,000 US$	1,000 US$	1,000 US$
		867,4	968,1	1.307,9	1.019,9
Total revenues main activities		10^6 Ruble	10^6 Dram	10^6 Dram	10^6 Dram
(goods + passenger transp.)		2.841,0	1.534,0	3.253,6	2.709,8
converted to US$		1,000 US$	1,000 US$	1,000 US$	1,000 US$
		1.605,5	5.292,3	8.016,9	6.549,4
Total costs main activities		10^6 Ruble	10^6 Dram	10^6 Dram	10^6 Dram
(goods + passenger transp.)		3.800,0	1.870,4	3.525,6	3.232,2
converted to US$		1,000 US$	1,000 US$	1,000 US$	1,000 US$
		2.147,4	6.452,9	8.687,1	7.812,0
Profit main activities		10^6 Ruble	10^6 Dram	10^6 Dram	10^6 Dram
		-959,0	-336,4	-272,0	-522,4
converted to US$		1,000 US$	1,000 US$	1,000 US$	1,000 US$
		-541,9	-1.160,6	-670,2	-1.262,6

Notes:

Total costs for transport activities in 1993 do not correspond to those given in the corresponding cost centre table; no explanation could be given for this divergence.

Due to insufficiencies in recording, it was not possible to explain the difference between the total annual revenues and costs as stated in the profit-and-loss statements of the balance sheets and those attributed to transport services only.

Above costs include costs for major repairs ("repair fund") as planned, not actual ones (see "Profit-and-loss statements")

Annex 1.2-5

Armenian Railways **Costs in 1,000 Rubles** **1993 (contind.)**

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Maj.repairs (rep. fund)*	Other costs	Total
1	Locomotive unit Sanain											
2	Locomotive unit Gyumri	66.696	24.678	7.105	98.358	2.445	474.084	12.788	1.136	211.460	27.137	925.887
3	Locomotive unit Yerevan	65.267	24.275	7.136	109.999	480	453.551	30.571	1.460	1.060	60.494	754.293
4	Wagon unit Gyumri	13.750	5.087	657		504		2.248	70	438	1.069	23.823
5	Wagon unit Yerevan	65.689	24.305	15.016		2.731		12.934	935	151.580	3.767	276.957
6	Railway station Gyumri	8.774	3.246	68				6.206	9		10.713	29.016
7	Railway station Yerevan	12.841	4.680	48				862	18			18.449
8	Maintenance unit Vanadzor	17.067	6.431	462		1.980		1.974	1.498	5.720	1.489	36.621
9	Maintenance unit Gyumri	22.120	8.184	94		4.370		1.342	632	33.291	1.875	71.908
10	Maintenance unit Yerevan	21.698	7.800	2.658		2.214		5.285	2.359	3.530	350	45.894
11	Maintenance unit Sevan	14.904	6.011	145		427		4.259	1.513	1.577	2.056	30.892
12	Maintenance unit Ijevan	9.518	3.521	1.251		3.304		752	2.482	1.149	2.089	24.066
13	Maintenance unit forestation	1.544	586	44					9	89	52	2.324
14	High voltage unit Gyumri	24.607	7.400	3.252				12.520	615	10.000	3.824	62.218
15	High voltage unit Yerevan	20.850	7.741	927		2.300		7.744	370	6.655	1.555	48.142
16	High voltage unit Hrazdan	30.242	11.533	905				19.392	779	12.946	3.214	79.011
17	Telecommunication unit Gyumri	17.993	6.262	163		1.387		15.280	219	780	339	42.423

Annex 1.2-5

Armenian Railways **Costs in 1,000 Rubles** **1993**

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Maj.repairs (rep. fund)*	Other costs	Total
18	Telecommunication unit Yerevan	22.114	7.914	510		2.412		20.114	574	3.060	1.003	57.701
19	Construction unit Gyumri	2.756	1.020	5.750		5.500		2.010	69	9.165		26.270
20	Construction unit Yerevan	2.831	1.048	341					418	30.833		35.471
21	State supervision	7.051	2.813	42				117	59		506	10.588
22	Administration Sub-total	231.688	85.465	39.426		3.946		294.600	21.776	16.667	504.468	1.198.036
	= Administration operation											
	+ Administration freight traffic											
	+ Administration passenger traff.											
	+ Assistance trains											
	+ Freight invoicing											
	+ Central control											
	+ Fire brigade											
	+ Depreciation freight wagons											
	Sub-total	680.000	250.000	86.000	208.357	34.000	927.635	450.998	37.000	500.000	626.000	3.799.990
	Auxiliary and service centres	96.100	35.000	41.500		39.800		698.200			247.500	1.158.100
	Total	776.100	285.000	127.500	208.357	73.800	927.635	1.149.198	37.000	500.000	873.500	4.958.090

* Costs as planned; actual expenses were only: 100.000

Annex 1.2-5

Armenian Railways **Costs** **1993** **converted to US$**** **(contind.)**

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Maj.repairs, (rep. fund)*	Other costs	Total
1	Operation unit Sanain											
2	Operation unit Gyumri	37.690	13.946	4.015	55.582	1.382	267.906	7.227	642	119.496	15.335	523.221
3	Operation unit Yerevan	36.883	13.718	4.033	62.161	271	256.303	17.276	825	599	34.185	426.253
4	Wagon unit Gyumri	7.770	2.875	371		285		1.270	40	248	604	13.462
5	Wagon unit Yerevan	37.121	13.735	8.486		1.543		7.309	528	85.658	2.129	156.509
6	Railway station Gyumri	4.958	1.834	38				3.507	5		6.054	16.397
7	Railway station Yerevan	7.256	2.645	27				487	10			10.426
8	Maintenance unit Vanadzor	9.645	3.634	261		1.119		1.116	847	3.232	841	20.695
9	Maintenance unit Gyumri	12.500	4.625	53		2.469		758	357	18.813	1.060	40.635
10	Maintenance unit Yerevan	12.262	4.408	1.502		1.251		2.987	1.333	1.995	198	25.935
11	Maintenance unit Sevan	8.422	3.397	82		241		2.407	855	891	1.162	17.457
12	Maintenance unit Ijevan	5.379	1.990	707		1.867		425	1.403	649	1.180	13.600
13	Maintenance unit forestation	873	331	25					5	50	29	1.313
14	High voltage unit Gyumri	13.905	4.182	1.838				7.075	348	5.651	2.161	35.160
15	High voltage unit Yerevan	11.782	4.374	524		1.300		4.376	209	3.761	879	27.205
16	High voltage unit Hrazdan	17.090	6.517	511				10.958	440	7.316	1.816	44.649
17	Telecommunication unit Gyumri	10.168	3.539	92		784		8.635	124	441	192	23.973

Annex 1.2-5

Armenian Railways **Costs** **1993** **converted to US$****

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Maj.repairs (rep. fund)*	Other costs	Total
18	Telecommunication unit Yerevan	12.497	4.472	288		1.363		11.366	324	1.729	567	32.607
19	Construction unit Gyumri	1.557	576	3.249		3.108		1.136	39	5.179		14.845
20	Construction unit Yerevan	1.600	592	193					236	17.424		20.045
21	State supervision	3.985	1.590	24				66	33		286	5.983
22	Administration Sub-total	130.927	48.296	22.280		2.230		166.479	12.306	9.419	285.076	677.013
	= Administration operation											
	+ Administration freight traffic											
	+ Administration passenger traff.											
	+ Assistance trains											
	+ Freight invoicing											
	+ Central control											
	+ Fire brigade											
	+ Depreciation freight wagons											
	Sub-total	384.269	141.276	48.599	117.743	19.213	524.209	254.860	20.909	282.551	353.754	2.147.382
	Auxiliary and service centres	54.306	19.779	23.452		22.491		394.554			139.863	654.445
	Total	438.576	161.054	72.051	117.743	41.705	524.209	649.414	20.909	282.551	493.617	2.801.827

* Costs as planned; actual expenses were only: 56.510

** Rubles converted into US$ at the average free exchange rate of 1.769,6 Ruble/$

Annex 1.2-5

Armenian Railways **Costs in 1,000 Dram** **1994 (contind.)**

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Maj.repairs (rep. fund)*	Other costs	Total
1	Operation unit Sanain											
2	Operation unit Gyumri	15.063	5.573	2.797	27.048	1.834	190.852	7.467	436	233.900	3.490	488.460
3	Operation unit Yerevan	10.951	4.001	139.153	26.568	780	172.380	2.333	566	79.400	4.953	441.085
4	Wagon unit Gyumri	1.889	699	552		57		259	219	50	357	4.082
5	Wagon unit Yerevan	7.181	2.552	16.593		815		6.270	703	41.700	5.538	81.352
6	Railway station Gyumri	1.510	559	182				1.375	3		503	4.132
7	Railway station Yerevan	2.170	785	105				246	24		201	3.531
8	Maintenance unit Vanadzor	2.927	1.082	527		1.038		700	894	114.000	498	121.666
9	Maintenance unit Gyumri	4.224	1.575	264		918		1.137	21	86.700	2.149	96.988
10	Maintenance unit Yerevan	3.256	1.192	3.586		1.607		1.931	808	85.900	1.038	99.318
11	Maintenance unit Sevan	2.559	947	415		384		1.898	876	5.100	1.135	13.314
12	Maintenance unit Ijevan	550	204			51			1.169		30	2.004
13	Maintenance unit forestation	183	68	7					8		59	325
14	High voltage unit Gyumri	3.705	1.371	1.087				5.386	164	205	1.777	13.695
15	High voltage unit Yerevan	3.252	1.203	1.160		494		3.653	125	215	789	10.891
16	High voltage unit Hrazdan	4.155	1.537	1.189				6.253	331	250	2.403	16.118
17	Telecommunication unit Gyumri	2.755	993	752		132		6.847	96	20	254	11.849

Annex 1.2-5

Armenian Railways **Costs in 1,000 Dram** **1994**

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Maj.repairs (rep. fund)*	Other costs	Total
18	Telecommunication unit Yerevan	3.187	1.168	1.782		122		6.939	270	4.406	635	18.509
19	Construction unit	1.897	702	2.000		800		696	52	3.005	6	9.158
20	Construction unit	2.922	1.056	4.301		3.468		801	6	13.300	155	26.009
21	State supervision	1.121	415	54					34		92	1.716
22	Administration total = Administration operation + Administration freight traffic + Administration passenger traff. + Assistance trains + Freight invoicing + Central control + Fire brigade + Depreciation freight wagons	20.442	5.019	32.894		25.003		167.309	13.764	139.249	2.564	406.244
	Sub-total	95.899	32.701	209.400	53.616	37.503	363.232	221.500	20.569	807.400	28.626	1.870.446
	Auxiliary and service centres	11.300	4.200	7.000		3.400		173.900			211.800	411.600
	Total	107.199	36.901	216.400	53.616	40.903	363.232	395.400	20.569	807.400	240.426	2.282.046

* Costs as planned; actual expenses were only: 78.000

Annex 1.2-5

Armenian Railways **Costs** **1994** **converted to US$**** **(contind.)**

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Maj.repairs, (rep. fund)*	Other costs	Total
1	Locomotive unit Sanain											
2	Locomotive unit Gyumri	51.968	19.227	9.650	93.316	6.327	658.441	25.761	1.504	806.958	12.041	1.685.192
3	Locomotive unit Yerevan	37.781	13.803	480.079	91.660	2.691	594.713	8.049	1.953	273.931	17.088	1.521.748
4	Wagon unit Gyumri	6.517	2.412	1.904		197		894	756	173	1.232	14.083
5	Wagon unit Yerevan	24.775	8.804	57.246		2.812		21.632	2.425	143.865	19.106	280.665
6	Railway station Gyumri	5.210	1.929	628				4.744	10		1.735	14.255
7	Railway station Yerevan	7.487	2.708	362				849	83		693	12.182
8	Maintenance unit Vanadzor	10.098	3.733	1.818		3.581		2.415	3.084	393.301	1.718	419.749
9	Maintenance unit Gyumri	14.573	5.434	911		3.167		3.923	72	299.116	7.414	334.610
10	Maintenance unit Yerevan	11.233	4.112	12.372		5.544		6.662	2.788	296.356	3.581	342.648
11	Maintenance unit Sevan	8.829	3.267	1.432		1.325		6.548	3.022	17.595	3.916	45.933
12	Maintenance unit Ijevan	1.898	704			176			4.033		104	6.914
13	Maintenance unit forestation	631	235	24					28		204	1.121
14	High voltage unit Gyumri	12.782	4.730	3.750				18.582	566	707	6.131	47.248
15	High voltage unit Yerevan	11.219	4.150	4.002		1.704		12.603	431	742	2.722	37.574
16	High voltage unit Hrazdan	14.335	5.303	4.102				21.573	1.142	863	8.290	55.607
17	Telecommunication unit Gyumri	9.505	3.426	2.594		455		23.622	331	69	876	40.879

Annex 1.2-5

Armenian Railways **Costs** **1994** **converted to US$****

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Maj.repairs (rep. fund)*	Other costs	Total
18	Telecommunication unit Yerevan	10.995	4.030	6.148		421		23.940	932	15.201	2.191	63.856
19	Construction unit	6.545	2.422	6.900		2.760		2.401	179	10.367	21	31.595
20	Construction unit	10.081	3.643	14.838		11.965		2.763	21	45.885	535	89.731
21	State supervision	3.867	1.432	186					117		317	5.920
22	Administration total	70.525	17.316	113.485		86.260		577.217	47.486	480.411	8.847	1.401.547
	= Administration operation											
	+ Administration freight traffic											
	+ Administration passenger traff.											
	+ Assistance trains											
	+ Freight invoicing											
	+ Central control											
	+ Fire brigade											
	+ Depreciation freight wagons											
	Sub-total	330.853	112.819	722.433	184.976	129.385	1.253.154	764.177	70.963	2.785.539	98.761	6.453.060
	Auxiliary and service centres	38.985	14.490	24.150		11.730		599.957			730.712	1.420.024
	Total	369.838	127.309	746.583	184.976	141.116	1.253.154	1.364.134	70.963	2.785.539	829.473	7.873.084

* Costs as planned; actual expenses were only: 269.101

** Drams converted into US$ at the average free exchange rate of 289,9 Dram/$

Annex 1.2-5

Armenian Railways **Costs in 1,000 Dram** **1995 (contind.)**

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Maj.repairs, (rep. fund)*	Other costs	Total
1	Locomotive unit Sanain	4.428	1.638	856	10.916		17.107	700		14.638	441	50.724
2	Locomotive unit Gyumri	50.715	18.764	28.536	46.519	3.208	269.615	14.491	4.946	227.909	30.688	695.391
3	Locomotive unit Yerevan	36.582	13.536	72.261	52.784	7.333	287.938	35.810	7.721	266.387	21.747	802.099
4	Wagon unit Gyumri	5.646	2.089	4.243		123		319	491	36.002	1.129	50.042
5	Wagon unit Yerevan	29.191	10.801	24.106		1.536		11.475	9.115	47.683	7.131	141.038
6	Railway station Gyumri	5.560	2.057	1.802				2.520	264		8.327	20.530
7	Railway station Yerevan	8.548	3.082	405				374	320		2.658	15.387
8	Maintenance unit Vanadzor	12.628	4.962	62.009		3.315		1.878	11.697	181.697	1.422	279.608
9	Maintenance unit Gyumri	13.292	4.319	52.148		3.674		2.885	2.881	71.800	5.316	156.315
10	Maintenance unit Yerevan	15.091	5.583	26.814		5.707		2.563	17.110	113.165	9.854	195.887
11	Maintenance unit Sevan	10.687	3.954	13.335		2.698		3.938	7.359	89.800	4.351	136.122
12	Maintenance unit Ijevan	2.662	907									3.569
13	Maintenance unit forestation	655	243	25					104		135	1.162
14	High voltage unit Gyumri	15.110	5.435	6.465				8.785	2.365	1.459	3.660	43.279
15	High voltage unit Yerevan	12.095	4.475	3.360		1.191		6.650	1.699	2.665	2.019	34.154
16	High voltage unit Hrazdan	16.081	5.950	4.736				14.049	3.664	9.980	1.036	55.496
17	Telecommunication unit Gyumri	10.560	3.727	4.176		424		12.333	1.249	3.536	514	36.519

Annex 1.2-5

Armenian Railways **Costs in 1,000 Dram** **1995**

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Maj.repairs (rep. fund)*	Other costs	Total
18	Telecommunication unit Yerevan	13.294	4.916	9.002		1.408		12.045	3.488	7.372	1.253	52.778
19	Construction unit	8.531	3.116	6.300		420		500	585	9.785		29.237
20	Construction unit	12.261	4.537	20.793		4.818		2.353	6.611	42.411	159	93.943
21	State supervision	4.167	1.458						1.012		222	6.859
22	Administration Sub-total = Administration operation + Administration freight traffic + Administration passenger traff. + Assistance trains + Freight invoicing + Central control + Fire brigade + Depreciation freight wagons	81.516	28.249	8.475		23.345		235.355	21.220	88.600	138.740	625.500
	Sub-total	369.300	133.798	349.847	110.219	59.200	574.660	369.023	103.901	1.214.889	240.802	3.525.639
	Auxiliary and service centres	11.700	4.200	19.700		1.800		107.300			34.000	178.700
	Total	381.000	137.998	369.547	110.219	61.000	574.660	476.323	103.901	1.214.889	274.802	3.704.339

* Costs as planned; actual expenses were only: 275.700

Annex 1.2-5

Armenian Railways **Costs** **1995** **converted to US$**** **(contind.)**

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Maj.repairs (rep. fund)*	Other costs	Total
1	Operation unit Sanain	10.911	4.036	2.109	26.897		42.152	1.725		36.068	1.087	124.985
2	Operation unit Gyumri	124.963	46.235	70.313	114.624	7.905	664.336	35.706	12.187	561.572	75.616	1.713.455
3	Operation unit Yerevan	90.139	33.353	178.052	130.061	18.069	709.484	88.236	19.025	656.382	53.585	1.976.385
4	Wagon unit Gyumri	13.912	5.147	10.455		303		786	1.210	88.710	2.782	123.304
5	Wagon unit Yerevan	71.927	26.614	59.398		3.785		28.275	22.460	117.492	17.571	347.520
6	Railway station Gyumri	13.700	5.068	4.440				6.209	651		20.518	50.586
7	Railway station Yerevan	21.062	7.594	998				922	788		6.549	37.914
8	Maintenance unit Vanadzor	31.116	12.226	152.791		8.168		4.627	28.822	447.704	3.504	688.959
9	Maintenance unit Gyumri	32.752	10.642	128.494		9.053		7.109	7.099	176.916	13.099	385.163
10	Maintenance unit Yerevan	37.184	13.757	66.070		14.062		6.315	42.159	278.840	24.280	482.669
11	Maintenance unit Sevan	26.333	9.743	32.858		6.648		9.703	18.133	221.269	10.721	335.407
12	Maintenance unit Ijevan	6.559	2.235									8.794
13	Maintenance unit forestation	1.614	599	62					256		333	2.863
14	High voltage unit Gyumri	37.231	13.392	15.930				21.646	5.827	3.595	9.018	106.640
15	High voltage unit Yerevan	29.802	11.026	8.279		2.935		16.386	4.186	6.567	4.975	84.156
16	High voltage unit Hrazdan	39.624	14.661	11.670				34.617	9.028	24.591	2.553	136.743
17	Telecommunication unit Gyumri	26.020	9.183	10.290		1.045		30.389	3.078	8.713	1.267	89.983

Annex 1.2-5

Armenian Railways **Costs** **1995** **converted to US$****

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Maj.repairs (rep. fund)*	Other costs	Total
18	Telecommunication unit Yerevan	32.757	12.113	22.181		3.469		29.679	8.594	18.165	3.087	130.046
19	Construction unit	21.021	7.678	15.523		1.035		1.232	1.441	24.110		72.040
20	Construction unit	30.211	11.179	51.234		11.872		5.798	16.290	104.501	392	231.477
21	State supervision	10.268	3.593						2.494		547	16.901
22	Administration Sub-total	200.857	69.606	20.883		57.522		579.919	52.286	218.312	341.858	1.541.243
	= Administration operation											
	+ Administration freight traffic											
	+ Administration passenger traff.											
	+ Assistance trains											
	+ Freight invoicing											
	+ Central control											
	+ Fire brigade											
	+ Depreciation freight wagons											
	Sub-total	909.961	329.681	862.029	271.581	145.870	1.415.972	909.279	256.014	2.993.507	593.340	8.687.234
	Auxiliary and service centres	28.829	10.349	48.541		4.435		264.389			83.777	440.320
	Total	938.790	340.029	910.570	271.581	150.305	1.415.972	1.173.668	256.014	2.993.507	677.117	9.127.554

* Costs as planned; actual expenses were only: 679.329

** Drams converted into US$ at the average free exchange rate of 405,8 Dram/$

Annex 1.2-5

Armenian Railways **Costs in 1,000 Dram** **1996**

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Maj.repairs (rep. fund)*	Other costs	Total
		Details by cost centre not available										
	Total***	427.700	155.900	322.800	71.500	56.200	583.500	248.500	215.200	879.300	271.600	3.232.200

* Costs as planned; actual expenses were only: 284.900

Armenian Railways **Costs** **1996** **converted to US$****

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Maj.repairs, (rep. fund)*	Other costs	Total
		Details by cost centre not available										
	Total***	1.033.720	376.799	780.184	172.810	135.831	1.410.278	600.607	520.123	2.125.205	656.438	7.811.995

* Costs as planned; actual expenses were only: 688.583

** Drams converted into US$ at the average free exchange rate of 413,7 Dram/$

*** Not including auxiliary and service centres

Annex 1.2-1

Balance sheets Azerbaijan Railways, main sphere (transport activities)

	End 1994 10^9 Manat	End 1995 10^9 Manat	30/09/96 10^9 Manat	End 1994 10^6 US$*	End 1995 10^6 US$*	30/09/96 10^6 US$*
Assets						
Long term assets	**169,8**	**166,4**	**2.323,1**	**39,3**	**37,5**	**550,2**
Major fixed assets: acquis. value	258,9	258,5	3.758,2	60,0	58,2	890,1
Major fixed assets: depreciation	89,1	92,1	1.444,8	20,6	20,7	342,2
Major fixed assets: residual value	169,8	166,4	2.313,4	39,3	37,5	547,9
Mobile equipment						
Uncompleted fixed assets			9,7	0,0	0,0	2,3
Financial assets	0,1					
Short term assets	**31,9**	**262,4**	**293,6**	**7,4**	**59,1**	**69,5**
Inventory of materials	2,8	37,3	53,3	0,6	8,4	12,6
Inventory finished goods	0,0	0,0	0,1	0,0	0,0	0,0
Minor fixed assets: acquis. val.	0,2	4,7	17,3	0,0	1,1	4,1
Minor fixed assets: depreciation	0,1	2,4	7,2	0,0	0,5	1,7
Minor fixed assets: residual val.	0,1	2,3	10,1	0,0	0,5	2,4
Other	20,8	62,6	24,1	4,8	14,1	5,7
Accounts receivable	5,8	158,6	201,9	1,3	35,7	47,8
Advance payments	0,0	0,1	1,8	0,0	0,0	0,4
Cash	2,4	1,6	2,3	0,6	0,4	0,5
Losses						
Balance	**201,7**	**428,9**	**2.616,7**	**46,7**	**96,6**	**619,8**
Liabilities						
Equity	**180,1**	**211,3**	**2.359,1**	**41,7**	**47,6**	**558,8**
Share capital	108,1	111,3	2.251,2	25,0	25,1	533,2
Fund for special purposes (reserves)		0,0	0,0	0,0	0,0	0,0
Other funds	71,9	100,0	107,9	16,7	22,5	25,6
Long-term liabilities	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**
Short- and medium-term liabilities	**21,7**	**217,6**	**257,6**	**5,0**	**49,0**	**61,0**
Short-term debts to banks	0,0	0,2	3,8	0,0	0,0	0,9
Bank loans for the staff						
Accounts payable:						
Suppliers	4,9	61,4	79,9	1,1	13,8	18,9
Salaries	0,6	5,4	11,5	0,2	1,2	2,7
Social insurance	0,8	4,9	16,3	0,2	1,1	3,9
Life and property insurance						
Non-governmental organisations						
Taxes	5,3	23,4	77,5	1,2	5,3	18,4
Various creditors	0,6	3,0	8,3	0,1	0,7	2,0
Provisions						
Reserve						
Various short-term liabilities	9,4	119,2	60,3	2,2	26,9	14,3
Balance	**201,7**	**428,9**	**2.616,7**	**46,7**	**96,6**	**619,8**

Annex 1.2-1

Official re-evaluation of fixed assets:

For balance sheet 31/12/93	have been multiplied by
- items on average	32 times
For balance sheet 31/03/94	
- items on average	30 times
For balance sheet 31/10/96	
- items on average	14,5 times

However the corresponding depreciation costs were not re-evaluated

Average exchange rates	Manat / US$
(provisional)	
End 1994	4.318,0
End 1995	4.440,0
30/09/96	4.222,0

Annex 1.2-2

Acquisition value of the assets of Azerbaijan Railways at the end of 1994 and 1995, at their respective values

Category	Acquisition value in Million Manat		
	End of 1994	End of 1995	End of 1996
Buildings	39,421	19,900	262,730
Permanent ways	71,780	68,852	888,440
Electric and transmission cables and installations	7,161	7,343	124,163
Machinery and equipment	11,558	12,145	144,234
Rolling stock	126,249	143,052	2,154,757
Tools and inventory	466	1,348	21,864
Other assets	2,291	5,897	35,259
Total	258,926	258,537	3,631,447
= in 1,000 US$ (approx.)	59,964	58,229	858,498
	(undervalued)	(undervalued)	

Annex 1.2-3

Azerbaijan Railways, main sphere (transport activities)

Profit and loss statements

	1994 Million Manat		1995 Billion Manat		1996 (9 months) Billion Manat	
	+	-	+	-	+	-
Gross receipts (main activities)	46.781,2		373,6		304,2	
Value added tax		5.435,5		38,2		19,3
Costs (main activities)		23.009,5		170,9		188,8
Profit (main activities)		18.336,2		164,5		96,1
	46.781,2	46.781,2	373,6	373,6	304,2	304,2
Profits and losses side activities	10.137,2	4.826,3	43,6	55,1	28,1	27,9
Net profit side activities		5.310,9		-11,5		0,2
	10.137,2	10.137,2	43,6	43,6	28,1	28,1
Total profit (official)	23.647,1		153,0		96,3	
Distribution:						
State (profit tax, about 35%)		8.277,6		53,0		33,4
"Accumulation fund"		6.546,2		40,6		18,3
"Consumption fund" (salaries)		8.604,9		56,6		42,8
Other funds and reserves		4,7		1,2		0,8
Social insurance (1%)		213,7		1,5		1,0
Profit after deduction of salaries and social insurance paid from profit:	14.828,5		94,9		52,5	

Conversion into US$

Average parity Manat/US$					
for 1994:	1.682,9	for 1995:	4.415,8	9 mon.96:	4.349,3

	1994 1000 US$		1995 1000 US$		1996 (9 months) 1000 US$	
	+	-	+	-	+	-
Gross receipts (main activities)	27.798,8		84.596,3		69.940,1	
Value added tax		3.229,9		8.656,3		4.442,1
Costs (main activities)		13.673,0		38.695,3		43.403,2
Profit (main activities)		10.895,9		37.244,8		22.094,9
	27.798,8	27.798,8	84.596,3	84.596,3	69.940,1	69.940,1
Profits and losses side activities	6.023,8	2.867,9	9.878,0	12.473,3	6.453,2	6.418,2
Net profit side activities		3.155,9		-2.595,3		34,9
	6.023,8	6.023,8	9.878,0	9.878,0	6.453,2	6.453,2
Total profit (official)	14.051,8		34.649,5		22.129,8	
Profit after deduction of salaries and social insurance paid from profit:	8.811,5		21.490,5		12.077,0	

Average exchange rates	Manat/ US$
1994	1.682,9
1995	4.415,8
1996 (9 months)	4.349,3

Annex 1.2-4

Azerbaijan Railways. General overview of performance

	Unit	1993	1994	1995	9 months '96	
Physical performance						
tkm sold (goods)	10^6 tkm	7.300	3.276	2.409	1.959	
of which - Short distance	"	3.094	2.219	1.776	1.125	
- Long distance	"	4.206	1.058	633	834	
tkm performed	"	8.629	4.380	3.195	2.374	
Passenger-km performed	10^6 Pass.km	1.330	1.104	787	416	
Commercial performance in current Manat						
Revenue from transport services	10^6 Manat	41.434	35.569	285.738	221.473	
of which - Goods short distance	"	17.408	22.773	172.944	119.185	
- Goods long distance	"	17.430	7.181	64.075	67.241	
- Other revenue goods	"	4.507	3.768	40.729	28.280	
- Passenger transport	"	2.022	1.800	7.944	6.634	
- Baggage and post serv.	"	68	47	47	134	
Costs of transport services	10^6 Manat	24.422	18.293	130.386	135.566	2)
of which - Goods transport	"	n.a.	13.095	102.744	100.961	
- Passenger tr. & bagg.	"	n.a.	5.198	27.641	34.605	
Profit from transport services	"	17.013	17.277	155.353	85.907	2)
Revenue from side and service activities 1)	10^6 Manat	n.a.	5.777	49.595	63.400	
Costs of these activities	"	n.a.	4.717	40.483	53.209	
Profit from these activities	"	1.892	1.060	9.112	10.191	
Other profits	"	3.037	5.311	-11.460	152	
Total profit	"	21.942	23.647	153.005	96.250	2)
Commercial performance converted to US$						
Average free exchange rate	Manat/US$	No rate avail.	1.682,9	4.415,8	4.349,3	
Revenue from transport services	1000 US$		21.136	64.709	50.921	
of which - Goods short distance	"		13.533	39.165	27.403	
- Goods long distance	"		4.267	14.510	15.460	
- Other revenue goods	"		2.239	9.224	6.502	
- Passenger transport	"		1.069	1.799	1.525	
- Baggage and post serv.	"		28	11	31	
Costs of transport services	"		10.870	29.527	31.169	2)
of which - Goods transport	"		7.781	23.268	23.213	
- Passenger tr. & bagg.	"		3.089	6.260	7.956	
Profit from transport services	"		10.266	35.181	19.752	2)
Revenue from side and service activities	1000 US$		3.433	11.231	14.577	
Costs of these activities	"		2.803	9.168	12.234	
Profit from these activities	"		630	2.064	2.343	
Other profits	"		3.156	-2.595	35	
Total profit	"		14.052	34.650	22.130	2)

1) No double counting involved
2) Plus/minus (respectively) personnel costs paid from the profit

10^6 Manat	8.817	58.107	43.724	
1000 US$	5.240	13.159	10.053	

Annex 1.2-5

Azerbaijan Railways, main sphere (transport activities) **Costs 1994 in 10^6 Manat**

	Cost centre	Salaries, wages	Materials	Fuels	Electricity	Other costs	Total	+ salaries* paid from profit
1	Passenger traffic	233,6	73,9	3,0	95,2	706,3	1.112,0	
2	Goods traffic (incl. containers)	108,7	8,4	5,9	98,6	285,7	507,3	
3	Stations	291,8	33,8	35,2	278,0	741,3	1.380,1	
4	Traction	417,9	154,2	620,0	3.285,6	1.453,4	5.931,0	
5	Wagons	424,4	162,8	216,9	81,8	2.473,3	3.359,2	
6	Permanent ways	408,7	120,9	68,9	53,2	2.414,6	3.066,3	
7	Maintenance of buildings	39,4	88,8	39,7	44,0	284,3	496,2	
8	Signalisation & telecom.	220,0	26,2	17,8	228,1	412,6	904,8	
9	Electrical installation	122,3	35,3	14,4	68,6	345,7	586,3	
10	Regional administrations	49,3	6,9	0,8	40,7	153,6	251,3	
11	Head office & other gen. services	191,6	12,9	41,6	11,2	440,9	698,1	
12	Sub-total	2.507,9	724,1	1.064,3	4.284,9	9.711,6	18.292,7	
13	Side and service activities	412,0	673,0	331,2	2.562,4	1.588,0	5.566,6	
14	Total	2.919,9	1.397,1	1.395,4	6.847,3	11.299,5	23.859,2	8.818,6

Annex 1.2-5

Azerbaijan Railways, main sphere (transport activities) **Costs 1994, converted to 1,000 US$****

	Cost centre	Salaries, wages	Materials	Fuels	Electricity	Other costs	Total	+ salaries* paid from profit
1	Passenger traffic	138,8	43,9	1,8	56,6	419,7	660,8	
2	Goods traffic (incl. containers)	64,6	5,0	3,5	58,6	169,8	301,4	
3	Stations	173,4	20,1	20,9	165,2	440,5	820,1	
4	Traction	248,3	91,6	368,4	1.952,4	863,7	3.524,4	
5	Wagons	252,2	96,8	128,9	48,6	1.469,7	1.996,1	
6	Permanent ways	242,9	71,8	41,0	31,6	1.434,8	1.822,1	
7	Maintenance of buildings	23,4	52,8	23,6	26,1	168,9	294,8	
8	Signalisation & telecom.	130,8	15,6	10,6	135,6	245,2	537,7	
9	Electrical installation	72,7	21,0	8,6	40,8	205,4	348,4	
10	Regional administrations	29,3	4,1	0,5	24,2	91,3	149,4	
11	Head office & other gen. services	113,9	7,7	24,7	6,6	262,0	414,9	
12	Sub-total	1.490,2	430,3	632,4	2.546,2	5.770,9	10.870,0	
13	Side and service activities	244,8	399,9	196,8	1.522,7	943,6	3.307,8	
14	Total	1.735,1	830,2	829,2	4.068,9	6.714,5	14.177,9	5.240,3

Annex 1.2-5

* Salaries, wages and social insurance

** Manat converted into US$ at the average free exchange rate of 1.682,9 Manat/$

Exchange rate Manat/US$ in 1994 (up to July market rate; afterwards Interbank FX auctions)

January	292,0
February	378,0
March	477,1
April	636,9
May	1.091,2
June	974,8
July	980,2
August	1.500,0
September	2.321,0
October	3.026,0
November	4.199,0
December	4.318,0

Annex 1.2-5

Azerbaijan Railways, main sphere (transport activities) **Costs 1995 in 10^6 Manat**

	Cost centre	Salaries, wages	Materials	Fuels	Electricity	Other	Total	+ salaries* paid from profit
1	Passenger traffic	751,0	415,2	82,2	808,3	2.682,0	4.738,7	
2	Goods traffic (incl. containers)	258,5	127,5	60,7	1.040,6	1.745,4	3.232,6	
3	Stations	690,2	359,2	140,9	3.738,9	6.081,5	11.010,7	
4	Traction	1.016,9	1.433,0	7.990,5	36.645,4	7.394,4	54.480,1	
5	Wagons	1.020,9	912,7	2.636,9	740,8	12.370,9	17.682,2	
6	Permanent ways	950,3	585,0	751,2	548,4	16.946,9	19.781,9	
7	Maintenance of buildings	95,3	936,3	175,9	399,7	1.381,4	2.988,7	
8	Signalisation & telecom.	528,2	310,7	159,2	2.415,3	2.312,3	5.725,6	
9	Electrical installation	302,2	414,4	244,1	981,2	2.143,0	4.085,0	
10	Regional administrations	181,8	73,1	95,4	334,2	444,0	1.128,5	
11	Head office & other gen. services	419,5	38,8	179,9	344,3	4.549,0	5.531,6	
12	Sub-total	6.214,8	5.605,8	12.516,9	47.997,1	58.051,0	130.385,5	
13	Side and service activities	1.198,0	7.108,6	2.611,1	24.859,7	7.978,7	43.756,1	
14	Total	7.412,8	12.714,4	15.128,0	72.856,7	66.029,7	174.141,6	58.106,6

Annex 1.2-5

Azerbaijan Railways, main sphere (transport activities) **Costs 1995, converted to 1,000 US$****

	Cost centre	Salaries, wages	Materials	Fuels	Electricity	Other	Total	+ salaries* paid from profit
1	Passenger traffic	170,1	94,0	18,6	183,1	607,4	1.073,1	
2	Goods traffic (incl. containers)	58,5	28,9	13,8	235,7	395,3	732,1	
3	Stations	156,3	81,3	31,9	846,7	1.377,2	2.493,5	
4	Traction	230,3	324,5	1.809,5	8.298,8	1.674,5	12.337,7	
5	Wagons	231,2	206,7	597,1	167,8	2.801,5	4.004,3	
6	Permanent ways	215,2	132,5	170,1	124,2	3.837,8	4.479,8	
7	Maintenance of buildings	21,6	212,0	39,8	90,5	312,8	676,8	
8	Signalisation & telecom.	119,6	70,4	36,0	547,0	523,7	1.296,6	
9	Electrical installation	68,4	93,8	55,3	222,2	485,3	925,1	
10	Regional administrations	41,2	16,6	21,6	75,7	100,6	255,6	
11	Head office & other gen. services	95,0	8,8	40,7	78,0	1.030,2	1.252,7	
12	Sub-total	1.407,4	1.269,5	2.834,6	10.869,5	13.146,3	29.527,3	
13	Side and service activities	271,3	1.609,8	591,3	5.629,8	1.806,9	9.909,1	
14	Total	1.678,7	2.879,3	3.425,9	16.499,3	14.953,2	39.436,4	13.158,9

Annex 1.2-5

* Salaries, wages and social insurance

** Manat converted into US$ at the average free exchange rate of 4.415,8 Manat/$

Exchange rate Manat/US$ in 1995 (Interbank FX auctions)

January	4.268,7
February	4.338,9
March	4.382,5
April	4.397,6
May	4.421,0
June	4.444,4
July	4.477,8
August	4.494,3
September	4.447,4
October	4.436,5
November	4.440,0
December	4.440,0

Annex 1.2-5

Azerbaijan Railways, main sphere (transport activities) Costs Jan.- Sept. 1996 in 10^6 Manat

	Cost centre	Salaries, wages	Materials	Fuels	Electricity	Other costs	Total	+ salaries* paid from profit
1	Passenger traffic	657,3	2.499,9	141,2	1.125,1	4.730,8	9.154,3	
2	Goods traffic (incl. containers)	261,4	105,7	35,3	857,9	3.963,0	5.223,3	
3	Stations	596,6	280,0	200,9	3.144,8	15.235,2	19.457,5	
4	Traction	857,2	2.017,8	7.334,9	31.599,8	7.310,1	49.119,9	
5	Wagons	783,9	1.543,8	1.565,8	1.003,3	9.070,5	13.967,4	
6	Permanent ways	803,6	1.176,0	625,0	631,2	17.159,2	20.395,1	
7	Maintenance of buildings	92,0	459,2	74,7	315,0	1.696,0	2.636,9	
8	Signalisation & telecom.	452,2	631,9	102,6	2.361,4	2.939,6	6.487,7	
9	Electrical installation	257,3	657,9	259,0	817,3	1.831,6	3.823,0	
10	Regional administrations	473,1	65,7	101,7	744,3	3.916,4	5.301,3	
11	Head office & other gen. services							
12	Sub-total	5.234,6	9.438,0	10.441,2	42.600,1	67.852,5	135.566,3	
13	Side and service activities	982,0	10.296,2	2.998,0	24.746,0	18.419,3	57.441,4	
14	Total	6.216,5	19.734,1	13.439,2	67.346,1	86.271,8	193.007,8	43.724,3

Annex 1.2-5

Azerbaijan Railways, main sphere (transport activities) **Costs Jan.- Sept. 1996, converted to 1,000 US$****

	Cost centre	Salaries, wages	Materials	Fuels	Electricity	Other costs	Total	+ salaries* paid from profit
1	Passenger traffic	151,1	574,8	32,5	258,7	1.087,7	2.104,8	
2	Goods traffic (incl. containers)	60,1	24,3	8,1	197,2	911,2	1.200,9	
3	Stations	137,2	64,4	46,2	723,0	3.502,9	4.473,7	
4	Traction	197,1	463,9	1.686,5	7.265,4	1.680,7	11.293,7	
5	Wagons	180,2	355,0	360,0	230,7	2.085,5	3.211,4	
6	Permanent ways	184,8	270,4	143,7	145,1	3.945,3	4.689,2	
7	Maintenance of buildings	21,2	105,6	17,2	72,4	389,9	606,3	
8	Signalisation & telecom.	104,0	145,3	23,6	542,9	675,9	1.491,7	
9	Electrical installation	59,1	151,3	59,5	187,9	421,1	879,0	
10	Regional administrations	108,8	15,1	23,4	171,1	900,5	1.218,9	
11	Head office & other gen. services							
12	Sub-total	1.203,5	2.170,0	2.400,6	9.794,6	15.600,7	31.169,5	
13	Side and service activities	225,8	2.367,3	689,3	5.689,6	4.235,0	13.206,9	
14	Total	1.429,3	4.537,3	3.089,9	15.484,2	19.835,6	44.376,4	10.053,1

Annex 1.2-5

* Salaries, wages and social insurance

** Manat converted into US$ at the average free exchange rate of 4.349,3 Manat/$

Exchange rate Manat/US$ in 1996 (Interbank FX auctions)

January	4.443,2
February	4.440,4
March	4.396,0
April	4.367,3
May	4.352,0
June	4.342,5
July	4.297,6
August	4.283,0
September	4.222,0

Annex 1.2-6

Separation of costs between passenger transport and goods transport

(Summary of an accounting document for 1995, simplified)

Cost centre / cost category	Distribution of costs (according to)	Nr.	Total cost	Amount to be allocated to passenger transport	Amount to be allocated to goods transport
I. Container and passenger transport, commercial service					
a) Stations					
Passenger transport					
Ticketing	Passenger transport	1			
Luggage	"	2			
Shunting for passenger transport	"	3			
Other services for passenger transport	"	4			
Technical services for passenger transport	"	5			
Sum 1-5		6			
All expenses for stations	Passenger transport	7			
Personnel costs for passenger transport	"	8			
Sum 1-8		9			
Container transport and commercial service					
All expenses for container transport and commercial service	Goods transport	10			

Annex 1.2-6

Cost centre / cost category	Distribution of costs (according to)	Nr.	Total cost	Amount to be allocated to pas-senger transport	Amount to be allocated to goods transport
Auxiliary services					
Shunting for goods transport	Goods transport	11			
Shunting at other stations	Wagon-km, except electric and Diesel trains	12			
Receiving trains, formalities	Goods transport	13			
Other expenses	Locomotive-km or train-km	14			
Sum 11-14		15			
Other expenses at stations	Salaries	16			
Other expenses	Salaries	17			
Sum 15 - 17		18			
Maintenance of the train staff	Goods transport	19			
Sum 9+10+18+19		20			
II. Locomotive operation					
A. Locomotives and motor coaches					
1. Electric locomotives					
Operation costs for passenger traffic	Passenger transport	21			
Electricity for traction for passenger traffic	"	22			
Operation costs for goods traffic	Goods traffic	23			
Electricity for traction for goods traffic	"	24			

Annex 1.2-6

Cost centre / cost category	Distribution of costs (according to)	Nr.	Total cost	Amount to be allocated to pas-senger transport	Amount to be allocated to goods transport
Operation costs for shunting	As for 3, 21 and 22*	25			
Equipment for passenger traffic	Passenger transport	26			
Equipment for goods traffic	Goods transport	27			
Equipment for shunting	As for 3, 21 and 22*	28			
Maintenance electric locomotives for passenger traffic	Passenger transport	29			
Maintenance electric locomotives for goods traffic	Goods transport	30			
Maintenance electric shunting locomotives	As for 3, 21 and 22*	31			
Minor repairs on electric locomotives for passenger traffic	Passenger transport	32			
Minor repairs on electric locomotives for goods traffic	Goods transport	33			
Minor repairs on electric shunting locomotives	As for 3, 21 and 22*	34			
Depreciation electric locomotives	?	35			
Depreciation electric shunting locomotives	As for 3, 21 and 22*	36			
Sum 21+23+(25 to 36)		37			
Other costs	In proportion of 37	38			
Overhead costs	In proportion of 37	39			

Annex 1.2-6

Cost centre / cost category	Distribution of costs (according to)	Nr.	Total cost	Amount to be attributed to passenger transport	Amount to be attributed to goods transport
Sum 37+38+39		40			
2. Electric motor coaches					
Operation costs	Passenger transport	41			
Electricity for traction	"	42			
3. Diesel locomotives					
Analogous to electric locomotives		43 to 60			
4. Diesel motor coach trains					
All costs	Passenger transport	61			
5. Steam locomotives					
All costs	As for 3, 21 and 22*	62			
Total locomotives and motor coaches (40+41+60+61+62)		63			
III. Wagons					
Technical services and minor repairs passenger wagons	Passenger transport	64			
Repairs passenger wagons	Passenger transport	65			
Repairs goods wagons	Goods transport	66			
Repairs insulated wagons	Goods transport	67			
Current maintenance passenger wagons	Passenger transport	68			

Annex 1.2-6

Cost centre / cost category	Distribution of costs (according to)	Nr.	Total cost	Amount to be attributed to passenger transport	Amount to be attributed to goods transport
Depreciation passenger wagons	"	69			
Depreciation luggage vans	"	70			
Depreciation of goods wagons, of containers and of refrigeration trains	Goods transport	71			
Sum 64 to 71		72			
Overhead costs	?	73			
General overhead costs	?	74			
Sum 72+73+74		75			
IV. Permanent ways					
Maintenance main lines	Gross tkm	76			
Depreciation of ground, civil structures and tracks	"	77			
Maintenance other lines	As for 3, 21 and 22*	78			
Guarding...	Locomotive-km ...	79			
Depreciation branch tracks	Goods transport	80			
Sum 76 to 80		81			
Common costs permanent ways	?	82			
General common costs permanent ways	?	83			
Sum 81+82+83		84			
V. Superstructures					
Details not given here		85 to 91			

Annex 1.2-6

Cost centre / cost category	Distribution of costs (according to)	Nr.	Total cost	Amount to be attributed to passenger transport	Amount to be attributed to goods transport
VI. Signalling and telecommunication					
Details not given here		92 to 99			
VII. Electricity supply					
Details not given here		100 to 107			
VIII. Services to foreign trains					
Details not given here		108 to 110			
IX. Regional offices					
Details not given here		111 to 119			
X. Head office					
Details not given here		120 to 124			

* The distribution key is not clear; it is probably meant "in proportion of the cost relation 3+21+22 / 11+23+24".

Annex 1.2-1

Balance sheets Georgian Railways, main sphere (transport activities)

	End 1993 10^6 Coupons	End 1994 10^9 Coupons	End 1995 10^6 Lari	30/09/96 10^6 Lari	End 1993 10^6 US$*	End 1994 10^6 US$*	End 1995 10^6 US$*	30/09/96 10^6 US$*
Assets								
Long term assets	**65.222,4**	**21.974,3**	**215,4**	**213,4**	**0,8**	**15,6**	**175,1**	**168,0**
Major fixed assets: acquis. value	77.596,8	16.665,7	230,0	243,2	1,0	11,9	187,0	191,5
Major fixed assets: depreciation	23.567,1	5.627,9	73,5	81,9	0,3	4,0	59,8	64,5
Major fixed assets: residual value	54.029,6	11.037,9	156,4	161,4	0,7	7,9	127,2	127,1
Mobile equipment	478,6	1,8	0,0	0,0	0,0	0,0	0,0	0,0
Uncompleted fixed assets	10.693,3	10.582,2	58,5	51,5	0,1	7,5	47,5	40,6
Financial assets	20,9	352,5	0,5	0,5	0,0	0,3	0,4	0,4
Short term assets	**198.993,0**	**26.680,2**	**57,7**	**61,2**	**2,6**	**19,0**	**46,9**	**48,2**
Inventory of materials	12.005,3	5.162,6	12,8	16,5	0,2	3,7	10,4	13,0
Minor fixed assets: acquis. val.	178,7	72,7	3,3	3,3	0,0	0,1	2,7	2,6
Minor fixed assets: depreciation	67,8	33,0	1,5	1,5	0,0	0,0	1,2	1,2
Minor fixed assets: residual val.	110,9	39,7	1,8	1,8	0,0	0,0	1,5	1,4
Other	4,8	0,7	0,0	0,0	0,0	0,0	0,0	0,0
Accounts receivable	11.583,5	2.143,4	36,1	33,0	0,1	1,5	29,4	26,0
Advance payments	53.107,6	2.133,2	4,7	6,4	0,7	1,5	3,9	5,0
Cash	122.181,0	17.180,6	2,2	3,4	1,6	12,2	1,8	2,7
Losses	**0,0**	**0,0**	**0,0**	**2,7**	**0,0**	**0,0**	**0,0**	**2,2**
Balance	**264.216,4**	**48.634,5**	**273,1**	**277,3**	**3,4**	**34,6**	**222,0**	**218,4**
Liabilities								
Equity	**107.150,3**	**28.784,2**	**230,6**	**236,4**	**1,4**	**20,5**	**187,5**	**186,1**
Share capital	50.719,6	52,6	0,1	0,1	0,7	0,0	0,0	0,0
Fund for special purposes (reserves)	53.021,8	28.679,0	230,5	236,3	0,7	20,4	187,4	186,0
Other funds	3.408,9	52,6	0,0	0,1	0,0	0,0	0,0	0,0
Long-term liabilities	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**
Short- and medium-term liabilities	**157.065,1**	**19.850,3**	**42,5**	**41,0**	**2,0**	**14,1**	**34,5**	**32,3**
Short-term debts to banks	1.879,5	151,1	0,8	0,4	0,0	0,1	0,6	0,3
Bank loans for the staff	0,1	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Accounts payable:								
Suppliers	24.446,1	7.489,5	14,5	10,9	0,3	5,3	11,8	8,6
Salaries	4.665,9	754,2	0,7	0,9	0,1	0,5	0,5	0,7
Social insurance	1.966,9	579,8	0,6	0,5	0,0	0,4	0,5	0,4
Life and property insurance	1,4	0,2	0,0	0,0	0,0	0,0	0,0	0,0
Non-governmental organisations	196,7	6,2	0,0	0,0	0,0	0,0	0,0	0,0
Taxes	29.896,6	1.474,4	3,5	3,5	0,4	1,0	2,9	2,7
Various creditors	7.643,6	3.706,1	8,7	10,5	0,1	2,6	7,1	8,3
Provisions		2.777,4	3,7	1,1	0,0	2,0	3,0	0,8
Reserve	10,8	0,5	0,0	1,8	0,0	0,0	0,0	1,4
Various short-term liabilities	86.357,5	2.910,9	9,9	11,5	1,1	2,1	8,1	9,0
Balance	**264.216,4**	**48.634,5**	**273,1**	**277,3**	**3,4**	**34,6**	**222,0**	**218,4**

Annex 1.2-1

Official re-evaluation of fixed assets:

A first re-evaluation took place for the balance sheet as of 31/12/92

For balance sheet 31/12/94	have been multiplied by
- items acquired before 01/10/93	300 times
- items acquired 01/10/92 - 01/04/93	95 "
- items acquired 01/04/93 - 01/08/93	35 "
- items acquired 01/08/93 - 01/10/93	7 "
- items acquired 01/10/93 - 01/12/93	1,4 "
- items acquired 01/12/93 - 01/01/94	1,0 "

For balance sheet 31/12/95	have been multiplied by
- items acquired before 01/01/94	12,7 times
- items acquired 01/01/94 - 01/10/94	12,7 "
- items acquired 01/10/94 - 01/01/95	1,0 "

Exchange rates	Per US$
End 1993	77.394 Coupons
End 1994	1,4047 10^6 Coup.
End 1995	1,2300 Lari
30.09.96	1,2700 Lari

Annex 1.2-2

Acquisition value of the assets of Georgian Railways existing in the books at the end of 1995

Category	Acquisition value (after revaluation) in 1,000 Lari
Buildings	26,899
Permanent ways	91,557
Electric and transmission cables and installations	11,340
Machinery and equipment	10,423
Rolling stock	89,030
Tools and inventory	715
Total	229,964
= in 1,000 US$ (approx.)	186,963

Annex 1.2-3

Georgian Railways. main sphere (transport activities)

Profit and loss statements

	1993 10^6 Coupons		1994 10^9 Coupons		1995 Million Lari		1996 (9 months) Million Lari	
	+	-	+	-	+	-	+	-
Gross receipts (main activities)	120.851		34.255,5		62,3		46,5	
Value added tax		11.257		948,4		3,7		6,7
Costs (main activities)		72.577		13.692,1		42,0		40,0
Profit (main activities)		37.017		19.615,1		16,7		-0,2
	120.851	120.851	34.255,5	34.255,5	62,3	62,3	46,5	46,5
Receipts and expenses not related to transport services	39.337	2.260	1.431,5	1.318,9	1,5	2,1	1,5	4,0
Net profit side activities		37.077		112,6		-0,6		-2,5
	39.337	39.337	1.431,5	1.431,5	1,5	1,5	1,5	1,5
Total profit	74.094		19.727,7		16,1		-2,7	
Distribution:								
State (profit tax)		28.331		2.591,1		2,1		
"Accumulation fund"		21.812		11.851,9		8,6		
"Consumption fund"		23.329		4.979,7		3,8		
Pension fund								
Other reserves		623		304,9		1,6		0,5

Conversion into US$

Average parity Coupons/US$: for 1993: 12.000 | for 1994: 1096488

Average parity Lari/US$: for 1995: 1,2846 | 9 mon.96: 1,2600

	1993 1000 US$		1994 1000 US$		1995 1000 US$		1996 (9 months) 1000 US$	
	+	-	+	-	+	-	+	-
Gross receipts (main activities)	10.070,9	0	31.241,1	0,0	48.508,8	0,0	36.916,2	0,0
Value added tax	0,0	938,1	0,0	864,9	0,0	2.854,5	0,0	5.327,8
Costs (main activities)	0,0	6.048,1	0,0	12.487,2	0,0	32.686,4	0,0	31.747,1
Profit (main activities)		3.084,7		17.889,0		12.967,9		-158,7
	10.070,9	10.070,9	31.241,1	31.241,1	48.508,8	48.508,8	36.916,2	36.916,2
Receipts and expenses not related to transport services	3.278,1	188,3	1.305,6	1.202,9	1.184,8	1.623,0	1.191,3	3.213,5
Net profit side activities		3.089,8		102,7		-438,3		-2.022,2
	3.278,1	3.278,1	1.305,6	1.305,6	1.184,8	1.184,8	1.191,3	1.191,3
Total profit	6.174,5		17.991,7		12.529,6		-2.181,0	

Annex 1.2-4

Georgian Railways. Transport and revenue statistics, 1993 - 1996 (contind.)

	Unit	1993	1994	1995	1996
Goods transport					
Total performance	10^3 tkm	1.553.554	955.291	1.245.981	1.141.381
- of which domestic	10^3 tkm	549.015	340.878	211.785	197.566
- international	10^3 tkm	1.003.163	613.949	1.034.090	943.270
- luggage	10^3 tkm	1.376	464	106	545
Tonnes transported	10^3 t	7.965,9	3.173,4	4.656,4	4.723,7
- of which domestic	10^3 t	3.210,0	1.764,8	1.286,6	1.412,0
- international	10^3 t	4.751,0	1.406,7	3.369,4	3.309,9
- luggage	10^3 t	5,0	1,9	0,4	1,8
Revenues		10^3 Coupons	10^6 Coupons	Lari	Lari for 9 months
		77.866.822	28.971.857	46.084.553	29.285.640
Revenues, converted to US$		US$	US$	US$	US$ for 9 months
		6.488.902	26.422.423	35.873.702	23.242.776
Portion of costs attributed to		10^3 Coupons	10^6 Coupons	Lari	Lari for 9 months
goods transport		39.507.956	6.907.258	20.220.891	n.a.
converted to US$		US$	US$	US$	US$ for 9 months
		3.292.330	6.299.441	15.740.593	n.a.
Passenger transport					
Total performance	10^3 pass.km	1.004.935	1.164.502	371.316	380.261
- of which domest.long dist.	10^3 pass.km	497.004	368.808	128.880	259.294
- suburban	10^3 pass.km	447.003	784.267	241.446	120.799
- international	10^3 pass.km	60.928	11.427	990	168
Passengers transported	10^3 passeng.	8.314,8	10.997,7	3.673,9	3.008,1
- of which domest. long dist.	10^3 passeng.	1.957,2	1.503,3	651,8	1.400,4
- suburban	10^3 passeng.	5.642,2	9.333,0	3.008,6	1.604,5
- international	10^3 passeng.	715,3	161,4	13,5	3,2
Revenues		10^3 Coupons	10^6 Coupons	Lari	Lari for 9 months
		14.957.659	446.898	625.119	1.641.851
Revenues, converted to US$		US$	US$	US$	US$ for 9 months
		1.246.472	407.572	486.613	1.303.068
Portion of costs attributed to		10^3 Coupons	10^6 Coupons	Lari	Lari for 9 months
passenger transport		20.183.122	4.392.264	12.426.469	n.a.
converted to US$		US$	US$	US$	US$ for 9 months
		1.681.927	4.005.758	9.673.164	n.a.

Annex 1.2-4

	Unit	1993	1994	1995	1996
Total revenues main activities		10^3 Coupons	10^6 Coupons	Lari	Lari for 9 months
(goods + passenger transp.)		92.824.481	29.418.755	46.709.672	30.927.491
converted to US$		US$	US$	US$	US$ for 9 months
		7.735.373	26.829.996	36.360.314	24.545.844
Total costs main activities		10^3 Coupons	10^6 Coupons	Lari	Lari for 9 months
(goods + passenger transept.)		59.691.078	11.299.522	32.647.360	32.682.000
converted to US$		US$	US$	US$	US$ for 9 months
		4.974.257	10.305.199	25.413.757	25.938.324
Profit main activities		10^3 Coupons	10^6 Coupons	Lari	Lari for 9 months
		33.133.403	18.119.233	14.062.312	-1.754.509
converted to US$		US$	US$	US$	US$ for 9 months
		2.761.117	16.524.797	10.946.557	-1.392.480

Annex 1.2-5

Georgian Railways, main sphere (transport activities) **Costs in 10^6 Coupons** **1993**

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Repairs, repair fund	Other costs	Total
1	Passenger traffic	1.145	424	242		106		403	156	579	579	3.634
2	Goods traffic (incl. containers)	463	171	5		34		176	1	12	20	882
3	Stations	1.781	659	22		34		509	13	102	283	3.403
4	Traction	3.885	1.437	336	9.051	1.054	9.190	425	278	1.368	371	27.395
5	Wagons	1.751	648	82		534		164	880	39	657	4.755
6	Permanent ways	2.616	968	393		625		72	557	5.733	1.855	12.819
7	Buildings	72	26	7		7		32	91	569	177	981
8	Signalisation & telecom.	774	287	61		68		379	61	186	142	1.958
9	Electrical installation	948	351	94		201		149	146	8	37	1.934
10	Regional administrations	556	206	7		78		87	53	31	71	1.089
11	Head office & other gen. services	251	93	2				64	17	60	355	842
12	Sub-total	14.242	5.270	1.251	9.051	2.741	9.190	2.460	2.253	8.687	4.547	59.692
13	Side and service activities	3.920	1.446	2.191		1.416		1.584	83	654	7.617	18.911
14	Total	18.162	6.716	3.442	9.051	4.157	9.190	4.044	2.336	9.341	12.164	78.603

Annex 1.2-5

Georgian Railways, main sphere (transport activities) Costs 1993 converted to US$*

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Repairs, repair fund	Other costs	Total
1	Passenger traffic	95.417	35.333	20.167		8.833		33.583	13.000	48.250	48.250	302.833
2	Goods traffic (incl. containers)	38.583	14.250	417		2.833		14.667	83	1.000	1.667	73.500
3	Stations	148.417	54.917	1.833		2.833		42.417	1.083	8.500	23.583	283.583
4	Traction	323.750	119.750	28.000	754.250	87.833	765.833	35.417	23.167	114.000	30.917	2.282.917
5	Wagons	145.917	54.000	6.833		44.500		13.667	73.333	3.250	54.750	396.250
6	Permanent ways	218.000	80.667	32.750		52.083		6.000	46.417	477.750	154.583	1.068.250
7	Buildings	6.000	2.167	583		583		2.667	7.583	47.417	14.750	81.750
8	Signalisation & telecom.	64.500	23.917	5.083		5.667		31.583	5.083	15.500	11.833	163.167
9	Electrical installation	79.000	29.250	7.833		16.750		12.417	12.167	667	3.083	161.167
10	Regional administrations	46.333	17.167	583		6.500		7.250	4.417	2.583	5.917	90.750
11	Head office & other gen. services	20.917	7.750	167				5.333	1.417	5.000	29.583	70.167
12	Sub-total	1.186.833	439.167	104.250	754.250	228.417	765.833	205.000	187.750	723.917	378.917	4.974.333
13	Side and service activities	326.667	120.500	182.583		118.000		132.000	6.917	54.500	634.750	1.575.917
14	Total	1.513.500	559.667	286.833	754.250	346.417	765.833	337.000	194.667	778.417	1.013.667	6.550.250

* Coupons converted into US$ at the average free exchange rate (TICEX) of 12.000 Coupons/$ (estimated)

Annex 1.2-5

Georgian Railways, main sphere (transport activities) **Costs in 10^9 Coupons** **1994**

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Repairs, repair fund	Other costs	Total
1	Passenger traffic	134,6	49,8	26,9		14,9		96,0	43,4	242,6	124,3	732,5
2	Goods traffic (incl. containers)	48,4	17,9	2,2		0,6		32,7	0,3	0,6	23,8	126,5
3	Stations	201,2	74,5	3,7		5,9		109,4	1,2	2,4	385,9	784,2
4	Traction	509,7	188,6	163,2	842,1	38,2	2.352,1	97,7	70,6	369,1	410,4	5.041,7
5	Wagons	218,2	80,7	20,8		69,5		34,2	275,2	12,4	474,2	1.185,2
6	Permanent ways	396,5	146,7	36,8		165,5		22,6	131,1	554,6	527,2	1.981,0
7	Buildings	9,7	3,6	3,2		0,7		11,7	12,7	111,8	68,6	222,0
8	Signalisation & telecom.	105,3	39,0	4,6		23,8		127,3	16,6	37,2	92,5	446,3
9	Electrical installation	130,4	48,3	17,9		33,9		57,6	22,7	2,4	89,4	402,6
10	Regional administrations	57,7	21,3	11,9		7,9		20,1	2,7	37,9	11,1	170,6
11	Head office & other gen. services	49,8	18,4	0,6				18,4	3,3		116,3	206,8
12	Sub-total	1.861,5	688,8	291,8	842,1	360,9	2.352,1	627,7	579,8	1.371,0	2.323,7	11.299,4
13	Side and service activities	725,8	268,8	498,5		186,9		333,4	17,9	621,6	659,9	3.312,8
14	Total	2.587,3	957,6	790,3	842,1	547,8	2.352,1	961,1	597,7	1.992,6	2.983,6	14.612,2

Annex 1.2-5

Georgian Railways, main sphere (transport activities) Costs 1994 converted to 1000 US$*

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Repairs, repair fund	Other costs	Total
1	Passenger traffic	122,8	45,4	24,5		13,6		87,6	39,6	221,3	113,4	668,0
2	Goods traffic (incl. containers)	44,1	16,3	2,0		0,5		29,8	0,3	0,5	21,7	115,4
3	Stations	183,5	67,9	3,4		5,4		99,8	1,1	2,2	351,9	715,2
4	Traction	464,8	172,0	148,8	768,0	34,8	2.145,1	89,1	64,4	336,6	374,3	4.598,0
5	Wagons	199,0	73,6	19,0		63,4		31,2	251,0	11,3	432,5	1.080,9
6	Permanent ways	361,6	133,8	33,6		150,9		20,6	119,6	505,8	480,8	1.806,7
7	Buildings	8,8	3,3	2,9		0,6		10,7	11,6	102,0	62,6	202,5
8	Signalisation & telecom.	96,0	35,6	4,2		21,7		116,1	15,1	33,9	84,4	407,0
9	Electrical installation	118,9	44,0	16,3		30,9		52,5	20,7	2,2	81,5	367,2
10	Regional administrations	52,6	19,4	10,9		7,2		18,3	2,5	34,6	10,1	155,6
11	Head office & other gen. services	45,4	16,8	0,5				16,8	3,0		106,1	188,6
12	Sub-total	1.697,7	628,2	266,1	768,0	329,1	2.145,1	572,5	528,8	1.250,4	2.119,2	10.305,1
13	Side and service activities	661,9	245,1	454,6		170,5		304,1	16,3	566,9	601,8	3.021,3
14	Total	2.359,6	873,3	720,8	768,0	499,6	2.145,1	876,5	545,1	1.817,3	2.721,1	13.326,4

* Coupons converted into US$ at the average free exchange rate (TICEX) of 1.096.488 Coupons/$

Annex 1.2-5

Georgian Railways, main sphere (transport activities) **Costs in 1000 Lari** **1995**

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Repairs, repair fund	Other costs	Total
1	Passenger traffic	395,4	146,7	280,1		34,5		214,7	173,7	1.073,9	869,4	3.188,4
2	Goods traffic (incl. containers)	140,5	52,1	6,2		2,6		63,9	0,2	73,5	17,9	356,9
3	Stations	662,5	245,8	14,9		5,4		216,5	8,1	95,1	845,6	2.093,9
4	Traction	1.556,9	577,5	684,5	1.954,8	56,2	3.879,9	288,7	319,5	775,4	477,3	10.570,7
5	Wagons	719,8	267,0	187,8		148,7		67,8	485,6	37,5	474,7	2.388,9
6	Railway lines	1.194,9	443,2	428,6		288,0		61,7	500,5	2.424,0	3.408,7	8.749,6
7	Buildings	25,7	9,5	4,6		6,2		32,4	54,1	470,5	517,2	1.120,2
8	Signalisation & telecom.	368,2	136,6	84,1		55,7		128,0	77,0	167,1	335,9	1.352,6
9	Electrical installation	404,6	150,1	135,0		58,8		113,0	100,4	32,9	507,0	1.501,8
10	Regional administrations	248,4	92,1	54,1		3,0		40,2	7,6	118,5	40,6	604,5
11	Head office & other gen. services	164,6	61,1	22,4		38,8		25,5	40,6		367,1	720,1
12	Sub-total	5.881,5	2.181,7	1.902,3	1.954,8	697,9	3.879,9	1.252,4	1.767,3	5.268,4	7.861,4	32.647,6
13	Side and service activities	2.363,0	587,4	2.698,3		784,2		1.478,6	107,3	2.083,3	1.063,9	11.166,0
14	Total	8.244,5	2.769,1	4.600,6	1.954,8	1.482,1	3.879,9	2.731,0	1.874,6	7.351,7	8.925,3	43.813,6

Annex 1.2-5

Georgian Railways, main sphere (transport activities) Costs 1995 converted to 1000 US$*

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Repairs, repair fund	Other costs	Total
1	Passenger traffic	307,8	114,2	218,0		26,9		167,1	135,2	836,0	676,8	2.482,0
2	Goods traffic (incl. containers)	109,4	40,6	4,8		2,0		49,7	0,2	57,2	13,9	277,8
3	Stations	515,7	191,3	11,6		4,2		168,5	6,3	74,0	658,2	1.630,0
4	Traction	1.211,9	449,5	532,8	1.521,7	43,7	3.020,2	224,7	248,7	603,6	371,5	8.228,6
5	Wagons	560,3	207,8	146,2		115,8		52,8	378,0	29,2	369,5	1.859,6
6	Railway lines	930,1	345,0	333,6		224,2		48,0	389,6	1.886,9	2.653,4	6.811,0
7	Buildings	20,0	7,4	3,6		4,8		25,2	42,1	366,3	402,6	872,0
8	Signalisation & telecom.	286,6	106,3	65,5		43,4		99,6	59,9	130,1	261,5	1.052,9
9	Electrical installation	315,0	116,8	105,1		45,8		88,0	78,2	25,6	394,7	1.169,0
10	Regional administrations	193,4	71,7	42,1		2,3		31,3	5,9	92,2	31,6	470,6
11	Head office & other gen. services	128,1	47,6	17,4		30,2		19,9	31,6		285,8	560,5
12	Sub-total	4.578,3	1.698,3	1.480,8	1.521,7	543,3	3.020,2	974,9	1.375,7	4.101,1	6.119,6	25.413,9
13	Side and service activities	1.839,4	457,3	2.100,4		610,4		1.151,0	83,5	1.621,7	828,2	8.692,0
14	Total	6.417,8	2.155,6	3.581,3	1.521,7	1.153,7	3.020,2	2.125,9	1.459,2	5.722,8	6.947,7	34.105,9

* Lari converted into US$ at the average free exchange rate (TICEX) of 1,2846 Lari/$

Annex 1.2-5

Georgian Railways, main sphere (transport activities) **Costs in 1000 Lari** **Jan.- Sept. 1996**

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Repairs, repair fund	Other costs	Total
1	Passenger traffic	404,8	117,4	345,7		39,0		79,2	445,6	165,9	1.343,6	2.941,2
2	Goods traffic (incl. containers)	138,4	40,1	4,3		1,4		29,5	1,5	63,5	9,4	288,1
3	Stations	621,4	180,2	18,2		9,3		154,3	12,4	58,6	476,5	1.530,9
4	Traction	1.682,6	488,0	809,2	1.372,0	66,9	2.906,9	45,7	841,4	550,9	1.615,2	10.378,8
5	Wagons	733,4	212,7	377,9		118,9		40,1	1.173,4	406,9	355,0	3.418,3
6	Permanent ways	1.299,7	376,9	386,7		152,9		24,2	1.037,0	4.145,1	723,2	8.145,7
7	Buildings	87,9	25,5	44,0				9,8	129,9	777,2	150,3	1.224,6
8	Signalisation & telecom.	372,6	108,1	18,9		25,8		59,9	220,5	203,0	91,3	1.100,1
9	Electrical installation	432,9	125,5	275,9		47,7		62,5	217,0	930,0	71,7	2.163,2
10	Regional administrations	423,9	122,9	90,3		3,5		33,3	76,2	434,0	307,0	1.491,1
11	Head office & other gen. services											
12	Sub-total	6.197,6	1.797,3	2.371,1	1.372,0	465,4	2.906,9	538,5	4.154,9	7.735,1	5.143,2	32.682,0
13	Side and service activities	2.351,1	681,8	2.723,6		390,8		1.161,0	189,2	562,5	1.831,5	9.891,5
14	Total	8.548,7	2.479,1	5.094,7	1.372,0	856,2	2.906,9	1.699,5	4.344,1	8.297,6	6.974,7	42.573,5

Annex 1.2-5

Georgian Railways, main sphere (transport activities) Costs Jan.- Sept. 1996 converted to 1000 US$*

	Cost centre	Salaries, wages	Social insurance	Materials	Fuels for traction	Fuels for other	Electricity for traction	Electricity for other	Depre-ciation	Repairs, repair fund	Other costs	Total
1	Passenger traffic	321,3	93,2	274,4		31,0		62,9	353,7	131,7	1.066,4	2.334,3
2	Goods traffic (incl. containers)	109,8	31,8	3,4		1,1		23,4	1,2	50,4	7,5	228,7
3	Stations	493,2	143,0	14,4		7,4		122,5	9,8	46,5	378,2	1.215,0
4	Traction	1.335,4	387,3	642,2	1.088,9	53,1	2.307,1	36,3	667,8	437,2	1.281,9	8.237,2
5	Wagons	582,1	168,8	299,9		94,4		31,8	931,3	322,9	281,7	2.713,0
6	Permanent ways	1.031,5	299,1	306,9		121,4		19,2	823,0	3.289,8	574,0	6.464,9
7	Buildings	69,8	20,2	34,9				7,8	103,1	616,8	119,3	971,9
8	Signalisation & telecom.	295,7	85,8	15,0		20,5		47,5	175,0	161,1	72,5	873,1
9	Electrical installation	343,6	99,6	219,0		37,9		49,6	172,2	738,1	56,9	1.716,8
10	Regional administrations	336,4	97,5	71,7		2,8		26,4	60,5	344,4	243,7	1.183,4
11	Head office & other gen. services											
12	Sub-total	4.918,8	1.426,4	1.881,8	1.088,9	369,4	2.307,1	427,4	3.297,6	6.139,0	4.081,9	25.938,3
13	Side and service activities	1.866,0	541,1	2.161,6		310,2		921,4	150,2	446,4	1.453,6	7.850,5
14	Total	6.784,7	1.967,6	4.043,4	1.088,9	679,5	2.307,1	1.348,8	3.447,7	6.585,5	5.535,5	33.788,8

* Lari converted into US$ at the average free exchange rate (TICEX) of 1,2600 Lari/$

Annex 1.2-6

Separation of costs between passenger transport and goods transport

(Summary of an accounting document for 1995, simplified)

Cost centre / cost category	Distribution of costs (according to)	Nr.	Total cost	Amount to be allocated to passenger transport	Amount to be allocated to goods transport
I. Container and passenger transport, commercial service					
a) Stations					
Passenger transport					
Ticketing	Passenger transport	1			
Luggage	"	2			
Shunting for passenger transport	"	3			
Other services for passenger transport	"	4			
Technical services for passenger transport	"	5			
Sum 1-5		6			
All expenses for stations	Passenger transport	7			
Personnel costs for passenger transport	"	8			
Sum 1-8		9			
Container transport and commercial service					
All expenses for container transport and commercial service	Goods transport	10			

Annex 1.2-6

Cost centre / cost category	Distribution of costs (according to)	Nr.	Total cost	Amount to be allocated to pas-senger transport	Amount to be allocated to goods transport
Auxiliary services					
Shunting for goods transport	Goods transport	11			
Shunting at other stations	Wagon-km, except electric and Diesel trains	12			
Receiving trains, formalities	Goods transport	13			
Other expenses	Locomotive-km or train-km	14			
Sum 11-14		15			
Other expenses at stations	Salaries	16			
Other expenses	Salaries	17			
Sum 15 - 17		18			
Maintenance of the train staff	Goods transport	19			
Sum 9+10+18+19		20			
II. Locomotive operation					
A. Locomotives and motor coaches					
1. Electric locomotives					
Operation costs for passenger traffic	Passenger transport	21			
Electricity for traction for passenger traffic	"	22			
Operation costs for goods traffic	Goods traffic	23			
Electricity for traction for goods traffic	"	24			

Annex 1.2-6

Cost centre / cost category	Distribution of costs (according to)	Nr.	Total cost	Amount to be allocated to pas-senger transport	Amount to be allocated to goods transport
Operation costs for shunting	As for 3, 21 and 22*	25			
Equipment for passenger traffic	Passenger transport	26			
Equipment for goods traffic	Goods transport	27			
Equipment for shunting	As for 3, 21 and 22*	28			
Maintenance electric locomotives for passenger traffic	Passenger transport	29			
Maintenance electric locomotives for goods traffic	Goods transport	30			
Maintenance electric shunting locomotives	As for 3, 21 and 22*	31			
Minor repairs on electric locomotives for passenger traffic	Passenger transport	32			
Minor repairs on electric locomotives for goods traffic	Goods transport	33			
Minor repairs on electric shunting locomotives	As for 3, 21 and 22*	34			
Depreciation electric locomotives	?	35			
Depreciation electric shunting locomotives	As for 3, 21 and 22*	36			
Sum 21+23+(25 to 36)		37			
Other costs	In proportion of 37	38			
Overhead costs	In proportion of 37	39			

Annex 1.2-6

Cost centre / cost category	Distribution of costs (according to)	Nr.	Total cost	Amount to be attributed to passenger transport	Amount to be attributed to goods transport
Sum 37+38+39		40			
2. Electric motor coaches					
Operation costs	Passenger transport	41			
Electricity for traction	"	42			
3. Diesel locomotives					
Analogous to electric locomotives		43 to 60			
4. Diesel motor coach trains					
All costs	Passenger transport	61			
5. Steam locomotives					
All costs	As for 3, 21 and 22*	62			
Total locomotives and motor coaches (40+41+60+61+62)		63			
III. Wagons					
Technical services and minor repairs passenger wagons	Passenger transport	64			
Repairs passenger wagons	Passenger transport	65			
Repairs goods wagons	Goods transport	66			
Repairs insulated wagons	Goods transport	67			
Current maintenance passenger wagons	Passenger transport	68			

Annex 1.2-6

Cost centre / cost category	Distribution of costs (according to)	Nr.	Total cost	Amount to be attributed to passenger transport	Amount to be attributed to goods transport
Depreciation passenger wagons	"	69			
Depreciation luggage vans	"	70			
Depreciation of goods wagons, of containers and of refrigeration trains	Goods transport	71			
Sum 64 to 71		72			
Overhead costs	?	73			
General overhead costs	?	74			
Sum 72+73+74		75			
IV. Permanent ways					
Maintenance main lines	Gross tkm	76			
Depreciation of ground, civil structures and tracks	"	77			
Maintenance other lines	As for 3, 21 and 22*	78			
Guarding...	Locomotive-km ...	79			
Depreciation branch tracks	Goods transport	80			
Sum 76 to 80		81			
Common costs permanent ways	?	82			
General common costs permanent ways	?	83			
Sum 81+82+83		84			
V. Superstructures					
Details not given here		85 to 91			

Annex 1.2-6

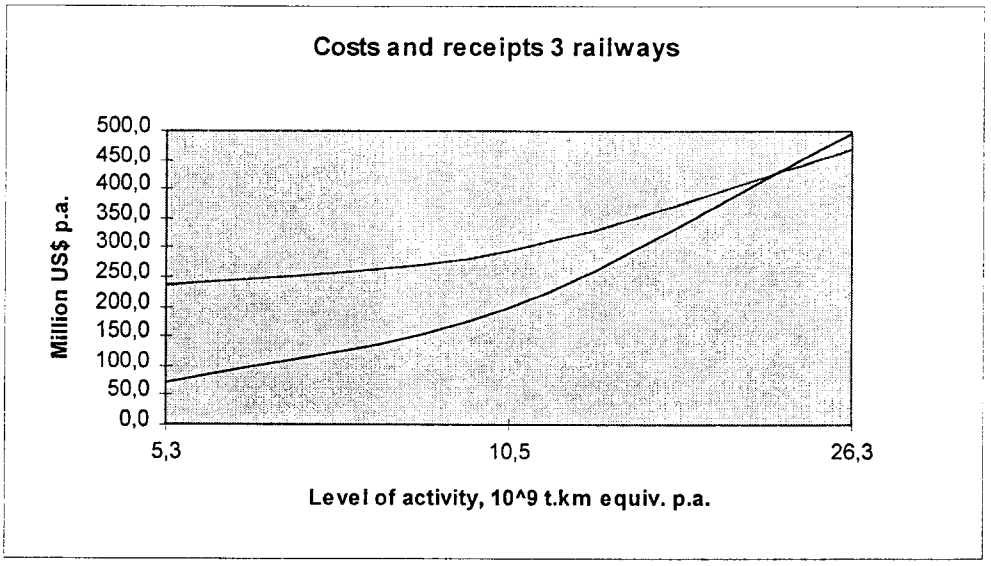
Cost centre / cost category	Distribution of costs (according to)	Nr.	Total cost	Amount to be attributed to passenger transport	Amount to be attributed to goods transport
VI. Signalling and telecommunication					
Details not given here		92 to 99			
VII. Electricity supply					
Details not given here		100 to 107			
VIII. Services to foreign trains					
Details not given here		108 to 110			
IX. Regional offices					
Details not given here		111 to 119			
X. Head office					
Details not given here		120 to 124			

* The distribution key is not clear; it is probably meant "in proportion of the cost relation 3+21+22 / 11+23+24".

Annex 1.2-7

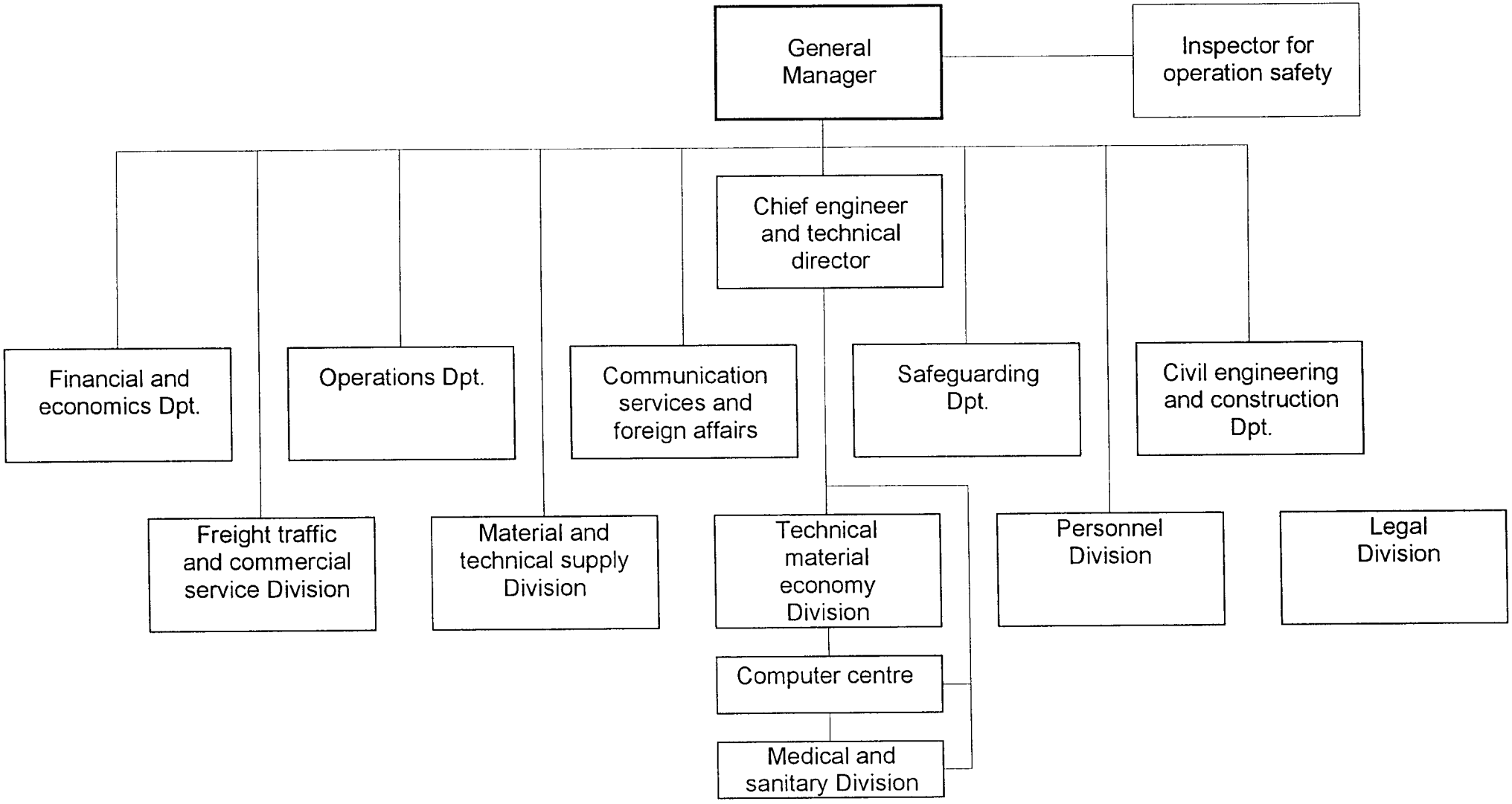
Break-even analysis and cost price for the use of infrastructure

	Unit	3 railways		
Level of activity		Present	Present x 2	Present x 5
10^3 tkm equiv.		5.268.742	10.537.484	26.343.710
Revenues	1000 US$			
% of revenues actually received	%			
Cash received	1000 US$	70.934,1	199.289,3	498.223,3
Costs excl. interests	1000 US$	234.982,5	293.194,9	467.832,2



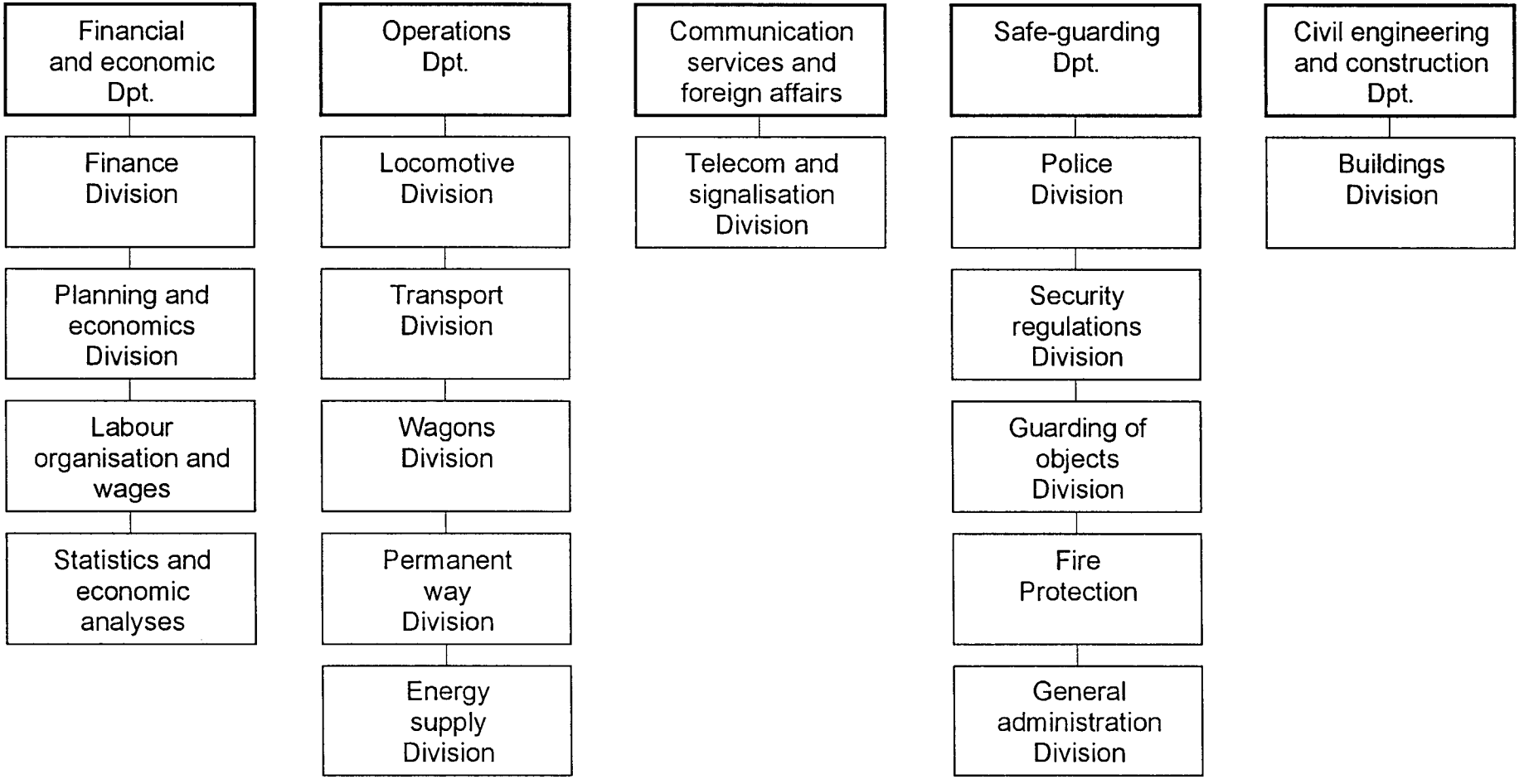
Organogramme of the Armenian Railway (ARM)

General Manager and directly subordinated units



Organogramme of the Management Structure

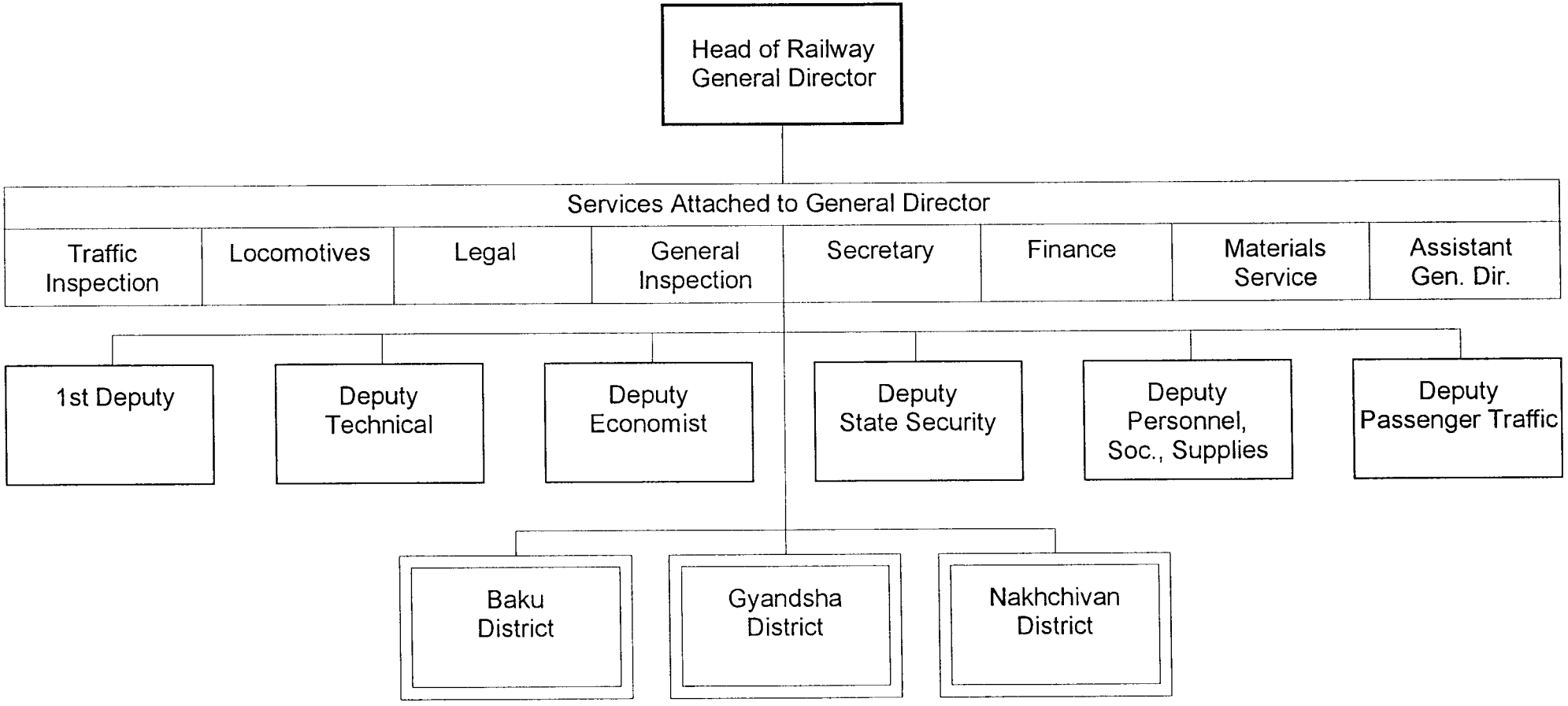
ARM-Headquarters: Departments and Divisions



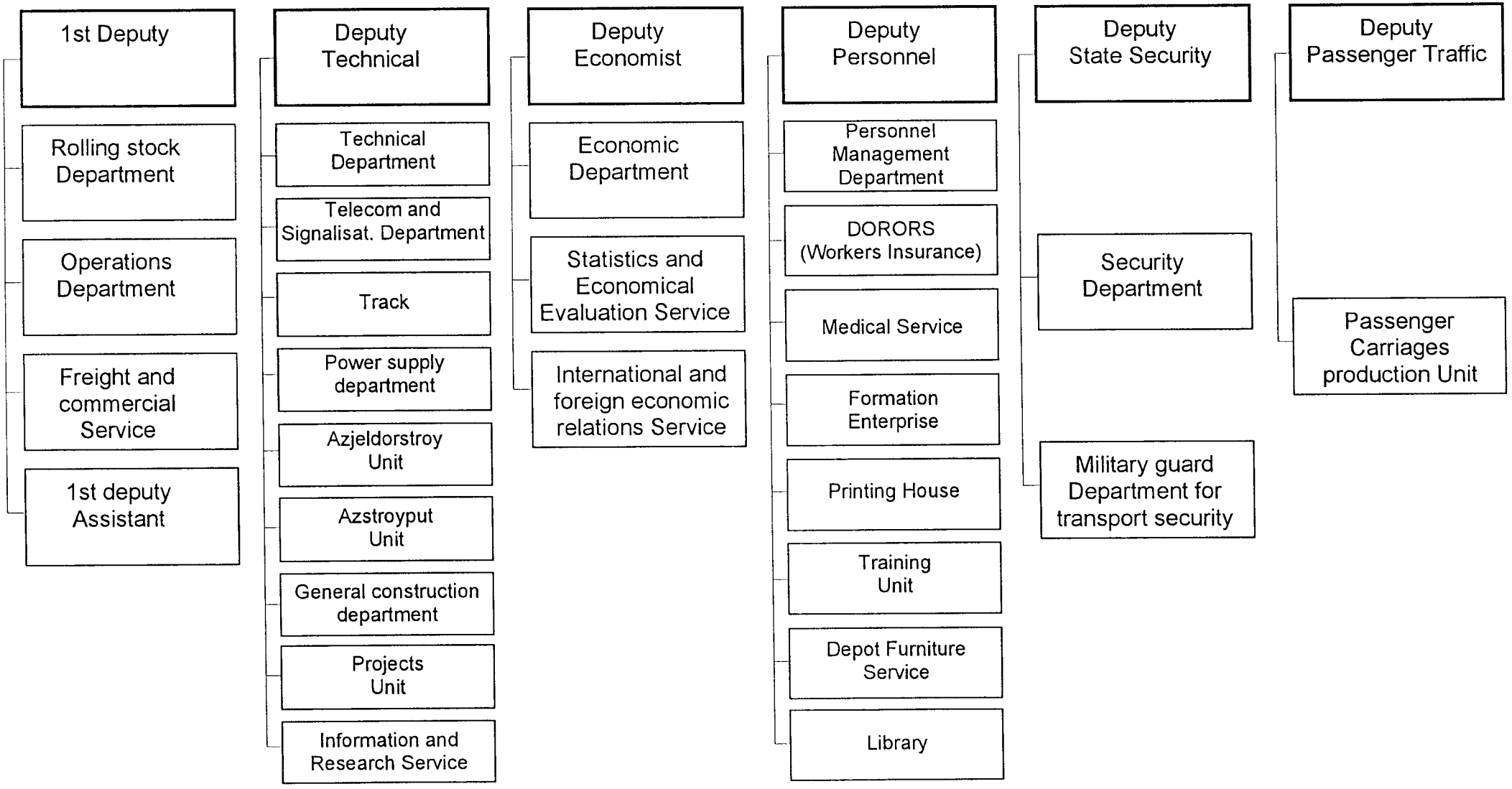
Local organisation:

76 stations, 5 permanent way districts, 1 track construction workshop, 2 telecom districts, 3 power current districts, 3 power current districts, 2 superstructure work districts, 3 overhaul workshops, 2 overhaul workshops for wagons, 1 enterprise for material-technical supply, 10 licensed state enterprises.

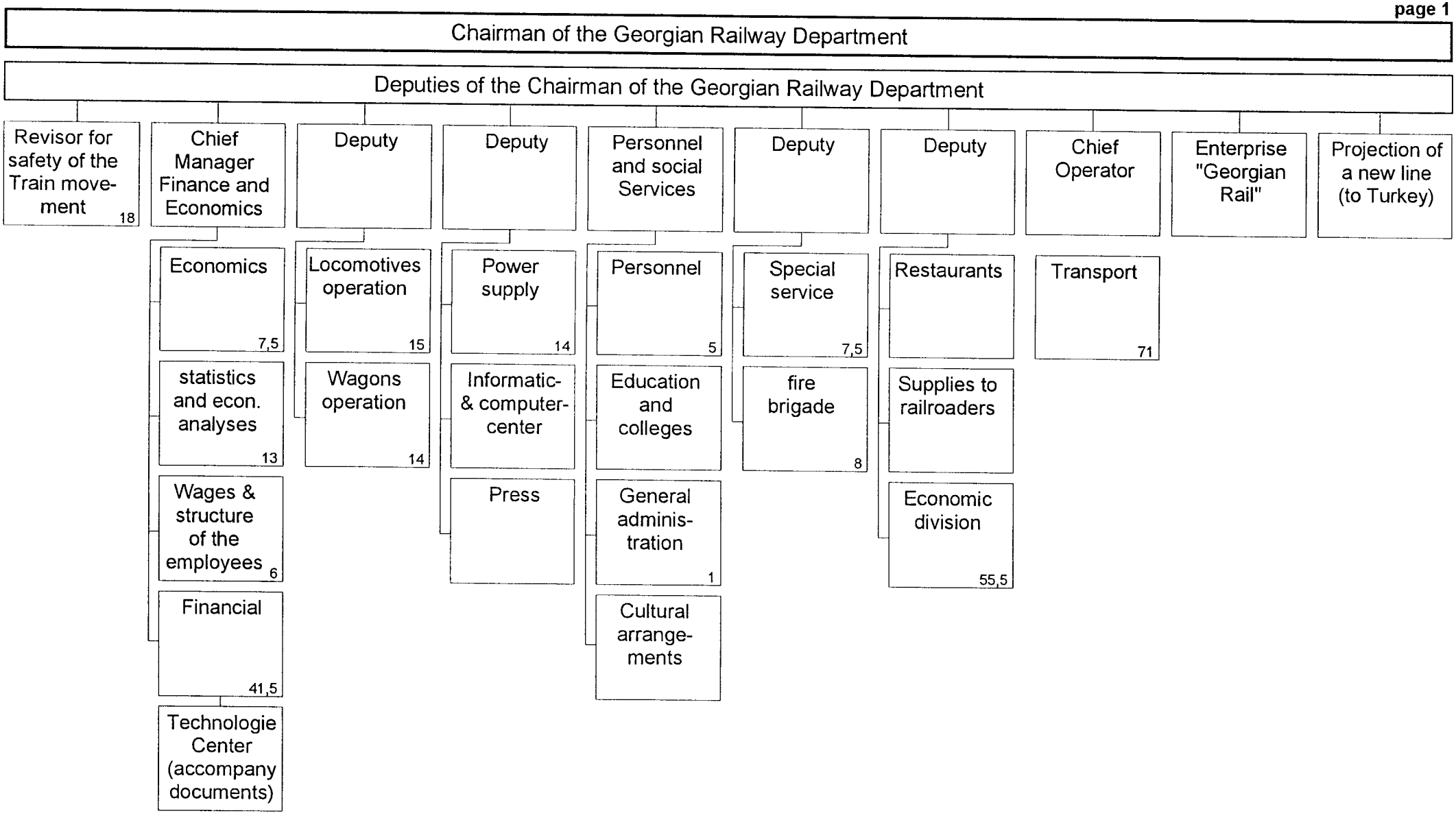
Azerbaijan State Railway Management Structure



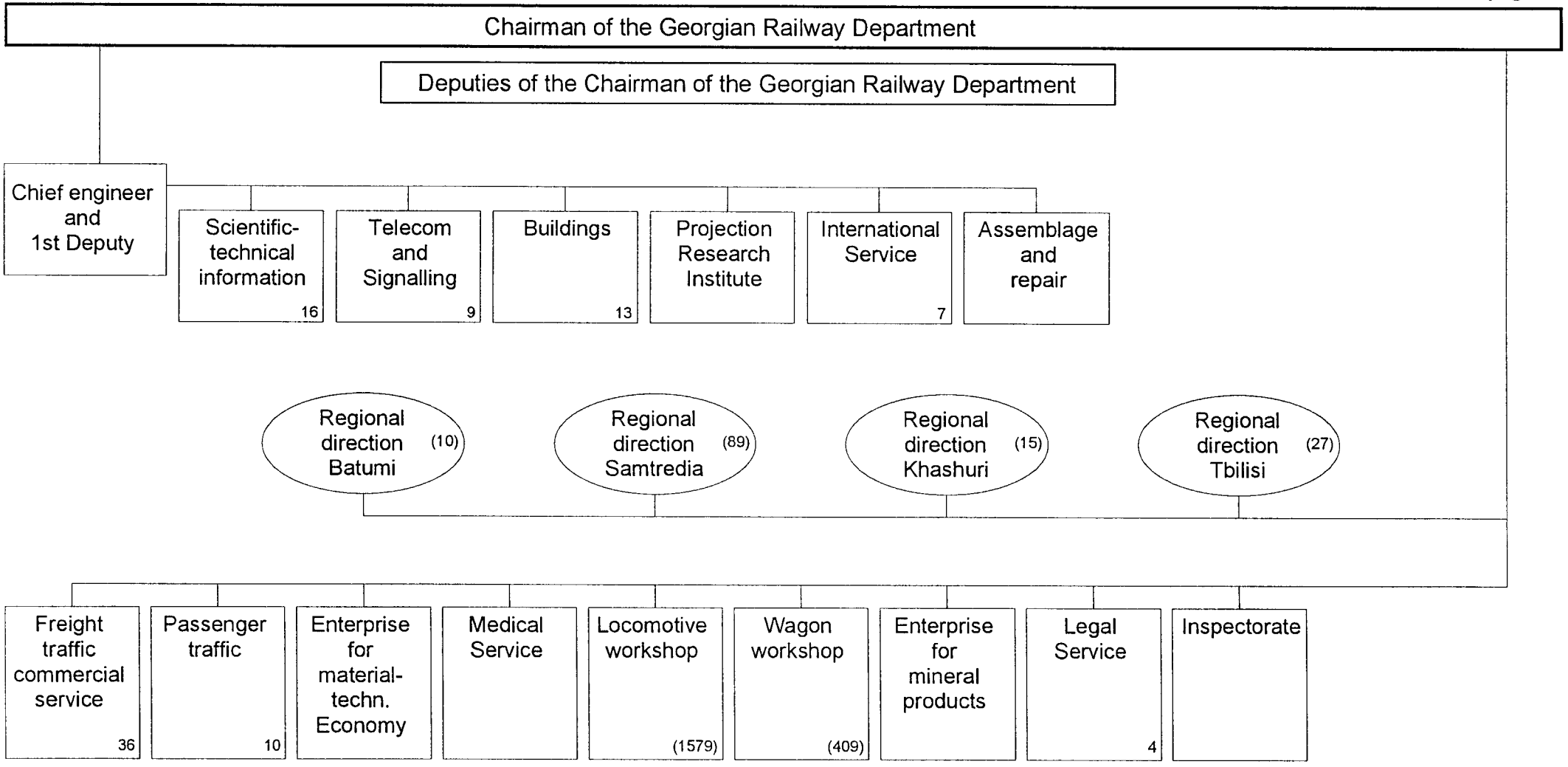
A.G.Z.D. - Headquarters Structure



Structure of the Georgian Railway Administration



Structure of the Georgian Railway Administration



The figures refer to the number of staff.

Annex 1.2-11

Armenian Railway (ARM)
Number of staff (1.2.1997)

1.	Total Persons (P)	4724 P
2.	Of these are working in the railway organisation (included affiliated enterprises)	3949 P
3.	In non-railway activities (e.g. industries, health, water supply, instruction) are employed further	775 P
4.	Besides of the ARM-organisation are 10 "licensed state enterprises" (supplying the ARM)	706 P
5.	The staff of the railway organisation is distributed on the following units:	3949 P
	– administration	93 P
	– 76 stations (of which 2 are affiliated enterprises)	1082 P
	– 3 overhaul workshops (affiliated enterprises)	604 P
	– 2 overhaul workshops for wagons (affiliated enterprises)	393 P
	– 5 permanent way districts (affiliated enterprises)	633 P
	– 1 track construction workshop (affiliated enterprise)	35 P
	– 3 power current districts (affiliated enterprises)	514 P
	– 2 telecom districts (affiliated enterprises)	304 P
	– 2 superstructure work districts (affiliated enterprises)	243 P
	– 1 loading /unloading facility (affiliated enterprise)	48 P
6.	Total (Railway organisation)	3949 P
7.	Of no.6 are to be contributed to infrastructure activities:	
	– administration	25 P
	– stations	350 P
	– permanent way districts	633 P
	– track construction workshop	35 P
	– power current districts	170 P
	– telecom districts	100 P
	Total staff for infrastructure	1313 P

Result: about 1/3 of the staff of the ARM is employed with infrastructure activities.

Annex 1.2-12

Georgian Railway (GRZD)

Number of staff (1.1.1997)

,

1. Total: Persons (P) in railway activities	17.952 P
2. Persons in non-railway activities (e.g. schools, institutes, hospitals)	4.972 P
3. Enterprises supplying the GRZD:	
- Locomotive repair works Tbilisi	1.579 P
- Wagon repair works Tbilisi	409 P
- others	1.568 P
4. Total: staff railway organisation	26.480 P
5. Staff employed in railway activities (no.1) is distributed on the following units:	17.952 P
5.1. Regional Divisions Batumi and Samtredia	4.027 P
5.2. Regional Divisions Tbilisi and Khashuri	7.816 P
5.3. "Administration"	6.109 P
Of the staff in no.5.3. are employed:	
5.3.1. in the "Georgian Railway Department	386 P
5.3.2. in the Regional Division Batumi	10 P
5.3.3. in the Regional Division Khashuri	15 P
5.3.4. in the Regional Division Samtredia	89 P
5.3.5. in the Regional Division Tbilisi	27 P
5.3.6. in the local organisation additional	5.582 P
5.3. (repeated)	6.109 P

Local units (see no.5.3.6.) are:
- in the regional divisions. Batumi and Samtredia: 73 stations (21 of them in Abkhasia), 4 locomotive workshops and 2 wagon workshops;
- in the regional divisions. Khashuri and Tbilisi: 76 stations, 4 locomotive workshops and 3 wagon workshops.

The organisation of the GRZD has been modified completely at the end of 1996. Many local units were abolished. The further repartition of the staff and its attribution to the new organisational units is not yet possible. Figures are not available.

Annex 2.1-1

Geographical structure of Armenian foreign trade

(in % of total value)

	Exports			Imports		
	1994	1995	1996	1994	1995	1996
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
FSU	***73.3***	***62.6***	***44.1***	***52.2***	***49.6***	***32.9***
Russia	39.0	33.5	33.1	28.5	20.0	14.6
Turkmenistan	30.5	25.4	6.0	1.8	19.2	10.7
Georgia	1.3	1.0	2.4	4.5	9.2	5.9
Ukraine	1.7	1.7	1.7	1.3	0.8	1.4
Kazakhstan	0.4	0.6	0.3	0.0	0.0	0.0
Non - FSU	***26.6***	***37.4***	***53.9***	***46.0***	***44.0***	***60.7***
Belgium	12.1	11.4	15.4	0.4	2.3	5.7
France	0.2	0.1	0.1	2.7	2.4	1.4
Germany	3.1	3.7	1.3	1.8	1.7	2.0
Italy	0.0	0.0	0.0	2.3	3.3	3.0
Netherlands	0.3	2.0	3.0	2.1	0.9	0.7
Great Britain	0.2	0.5	1.1	0.1	0.3	0.8
Iran	6.8	12.9	15.1	10.8	8.9	17.4
Turkey	0.1	1.0	2.1	0.1	0.4	0.7
USA	0.2	0.2	1.5	24.4	17.0	12.0
South Africa	0.0	3.1	12.5	0.0	0.4	4.9

Annex 2.1-2

Geographical structure of Azerbaijan foreign trade

1. Exports

(% of total value)

	1989	1990	1991	1992	1993	1994	1995
FSU	**93.7**	**94.9**	**93.3**	**40.8**	**51.6**	**43.1**	**39.6**
Russia			56.1		25.6	21.9	18.1
Ukraine			12.3		6.7	9.1	6.1
Belarus			4.7		2.1	1.2	0.5
Kazakhstan			3.9		4.2	2.6	3.1
Turkmenistan			4.2		5.4	2.7	2.4
Uzbekistan			2.4		0.6	0.4	0.7
Georgia			5.7		4.2	2.6	7.6
Non-FSU	**6.3**	**5.1**	**6.1**	**59.2**	**48.4**	**56.9**	**60.4**
European Union					6.3	11.0	17.1
Turkey					8.4	2.6	4.8
Iran					26.6	38.0	29.8

2. Imports

(% of total value)

	1989	1990	1991	1992	1993	1994	1995
FSU	**73.1**	**73.8**	**80.3**	**56.0**	**56.2**	**62.5**	**34.2**
Russia			45.0		23.1	15.1	13.2
Ukraine			22.7		9.7	11.1	5.0
Belarus			2.3		1.5	1.0	0.7
Kazakhstan			4.2		6.4	6.7	2.6
Turkmenistan			0.2		9.9	25.1	7.7
Uzbekistan			1.7		0.3	0.3	1.2
Georgia			1.6		3.3	1.0	2.8
Non-FSU	**26.9**	**26.2**	**19.7**	**44.0**	**43.8**	**37.5**	**65.8**
European Union					7.1	7.6	11.7
Turkey					11.5	9.8	21.0
Iran					7.6	8.6	12.0

Annex 2.1-3

Geographical structure of Georgian foreign trade

1. Exports

(% of total value)

	1989	1990	1991	1992	1994	1995
FSU	**94.0**	**95.7**	**99.1**	**96.3**	**...**	**...**
Russia			66.6	54.7	33.7	30.8
Ukraine			10.3	12.4	2.1	...
Belarus			2.0	3.2	...	...
Kazakhstan			6.2	3.6	2.0	...
Turkmenistan			1.5	10.2	10.0	4.5
Uzbekistan			2.9	2.4	...	...
Azerbaijan			1.7	6.4	9.4	6.6
Armenia			2.3	0.6	8.3	12.4
Non FSU	**6.0**	**4.3**	**0.9**	**3.7**	**...**	**...**
Europe			0.4	3.3	...	17.2
Turkey			0.0	0.2	14.6	22.8
Iran			-	-	1.1	...

2. Imports

(% of total value)

	1989	1990	1991	1992	1994	1995
FSU	**75.6**	**72.3**	**84.5**	**96.8**	**...**	**...**
Russia			50.7	10.3	8.4	13.6
Ukraine			16.9	10.1	...	...
Belarus			2.4	1.8	...	...
Kazakhstan			1.4	0.9	...	...
Turkmenistan			0.0	64.9	65.0	13.7
Uzbekistan			1.2	1.1	...	...
Azerbaijan			6.0	1.2	4.9	11.1
Armenia			1.5	0.6	0.3	0.6
Non-FSU	**24.4**	**27.7**	**15.5**	**3.2**	**...**	**...**
Europe			4.1	0.5	...	...
Turkey			6.8	0.4	10.8	21.0
Bulgaria			...	...	0.6	7.0
Romania			...	...	1.0	7.7

Annex 2.1-4

Commodity structure of foreign trade of Armenia 1996

Commodity group	Export		Import	
	tons	%	tons	%
Total	**230,952**	**100.0**	**960,689**	**100.0**
Live animals and animal products	10	0.0	51,288	5.3
Vegetable products	316	0.1	332,759	34.6
Animal, vegetable fats/oils	74	0.0	51,288	5.3
Prepared foodstuff	4,751	2.1	112,029	11.7
Mineral products	116,736	50.5	329,363	34.3
Chemical products	3,638	1.6	28,075	2.9
Plastics, rubber	2,236	1.0	4,010	0.4
Raw hides, skins, leather, furs	1,869	0.8	86	0.0
Wood	103	0.0	1,887	0.2
Paper and paperboard	96	0.0	4,457	0.5
Textiles	1,016	0.4	17,474	1.8
Footwear, umbrellas	91	0.0	239	0.0
Articles of stone, gypsum, cement	2,673	1.2	7,253	0.8
Metals	85,679	37.1	5,640	0.6
Machinery	6,644	2.9	2,674	0.3
Vehicles, aircraft, vessels	1,512	0.7	1,546	0.2
others	3,508	1.5	10,621	1.1

Commodity structure of Azerbaijan foreign trade

Exports

(in % of total value)

Commodity group	1994			1995		
	Total	FSU	Non-FSU	Total	FSU	Non-FSU
live animals, animal products	0.1	0.2	0.0	0.1	0.2	0.1
plant products	2.3	5.0	0.2	2.4	5.5	0.3
animals or vegetable oil and fat	0.0	0.0	0.0	0.1	0.1	0.0
food, beverages, tobacco	7.7	17.1	0.5	4.5	8.5	1.8
mineral products (oil, ore, build. mater.)	34.2	25.2	41.0	51.8	49.3	53.4
chemical products	3.6	6.7	1.3	3.6	7.7	0.8
plastic, rubber, rubber products	1.6	2.9	0.6	2.5	4.5	1.1
hides, furs and products thereof	0.1	0.1	0.1	0.3	0.0	0.4
timber, timber products	0.1	0.0	0.1	0.0	0.0	0.1
pulp, paper, cardboard	0.6	0.1	0.9	0.1	0.1	0.1
textiles	18.0	8.4	25.2	22.8	5.0	34.5
shoes and oth. prod. of ligth industry	0.1	0.3	0.0	0.1	0.0	0.0
prod. of stone, ceramics, cement, glass	0.2	0.4	0.0	0.3	0.7	0.0
precious metals and stones	0.0	0.0	0.0	0.0	0.0	0.0
metal, metal products	16.5	1.4	28.0	3.2	1.4	4.4
machines, electrical appliances	14.0	30.4	1.7	7.2	14.8	2.2
means of transport	0.7	1.2	0.3	0.8	1.2	0.6
other equip., watches, musical instr.	0.2	0.4	0.0	0.3	0.8	0.0
other finished industrial products	0.1	0.2	0.0	0.0	0.1	0.0

Commodity structure of Azerbaijan foreign trade

Imports

(in % of total value)

Commodity group	1994			1995		
	Total	FSU	Non-FSU	Total	FSU	Non-FSU
live animals, animal products	5.4	4.2	7.5	11.1	6.9	13.3
plant products	10.1	9.6	10.8	7.7	6.8	8.2
animals or vegetable oil and fat	3.0	0.2	7.5	8.2	0.3	12.3
food, beverages, tobacco	7.9	4.4	13.7	14.5	6.2	18.8
minaral products (oil, ore, build. mater.)	33.3	49.0	7.3	15.1	32.2	6.2
chemical products	4.9	2.5	8.8	9.2	6.3	10.7
plastic, rubber, rubber products	1.9	2.6	0.6	1.7	3.3	0.9
hides, furs and products thereof	0.2	0.1	0.4	0.4	0.0	0.6
timber, timber products	0.8	1.1	0.2	0.8	1.3	0.5
pulp, paper, cardboard	0.9	1.0	0.7	2.3	3.7	1.5
textiles	2.3	1.2	4.2	1.7	1.5	1.8
shoes and oth. prod. of ligth industry	0.9	0.3	1.9	0.3	0.1	0.4
prod. of stone, ceramics, cement, glass	0.9	1.0	0.8	1.2	1.9	0.8
precious metals and stones	0.0	0.0	0.1	0.0	0.0	0.0
metal, metal products	12.5	15.0	8.4	6.3	12.9	2.9
machines, electrical appliances	10.1	4.6	19.4	12.4	12.3	12.5
means of transport	2.9	2.4	3.7	5.5	3.2	6.7
other equip., watches, musical instr.	0.5	0.1	1.2	0.6	0.7	0.5
other finished industrial products	1.5	0.7	2.8	1.1	0.6	1.3

Annex 2.1-6

Commodity structure of foreign trade of Georgia

(in % of total value)

Commodity group	Export		Import	
	1994	1995	1994	1995
Electric power	-	-	2.8	2.3
Crude oil	5.0	7.7	11.1	30.9
Natural gas	-	-	64.4	13.8
Coal, coke	0.3	0.3	0.4	0.4
Ferrous metallurgy	30.1	33.9	0.4	0.4
Non-ferrous metallurgy	0.9	3.0	0.2	0.2
Chemical and petrol prod.	11.4	9.8	2.4	4.2
Machinery and metal works	14.1	7.2	4.1	6.5
Wood, pulp, paper products	1.8	2.0	0.3	0.6
Building materials	3.7	4.4	1.2	1.3
Light industry products	10.2	4.1	0.9	2.0
Agricultural and food prod.	21.6	27.3	10.8	34.4
Others	1.1	0.2	1.1	3.1

Annex 2.1-7

Main export items of Azerbaijan

(in Tons)

Type of goods	1994	1995
fish (fresh, processed)	1,878	998
fruit, vegetable	31,985	8,492
citrus fruit	415	149
tea	1,972	1,274
cotton products	1,927	19,158
food, preserve	1,721	3,778
tomato pulp	10,064	6,463
fruit juices	6,804	5,648
beverages (alc., non-alc.)	1,100	790
champagne	2,026	1,401
tobacco	12,918	8,952
betonit	147,488	68,258
heavy spare	13,264	5,945
natural stone (unprocessed)	3,826	331
cement		180
iron ore	4,225	
petrol	412	89,192
kerosene	132,190	188,718
diesel	1,507,093	1,625,216
mazout	58,322	125,621
lubricants	100,618	119,557
other petrochem. products	5,411	22,824
liquid gas	15,150	8,762
petrol coke	15,010	4,817
bitumen	52	14,536
chem. products	74,590	45,427
aluminium oxide	14,488	17,980
hydrocarbone	39,007	10,108
mineral fertiliser	7,836	5,824
tyres	767	250
timber, chipboards	2,195	875
paper	12,826	2,188
cotton	78,286	75,992
metallurgical products	348,783	45,073
non-ferrous metals	9,983	4,277
air conditioning	3,940	2,407
compressors	8,467	1,893
refrigerators	3,555	644
electric motors	990	821
tractors	800	3,570
busses	250	90
cars	21	5
lorries	880	60
motorcycles	263	76
Total	**2,683,798**	**2,548,620**

Annex 2.1-8

Main import items of Azerbaijan

(in Tons)

Type of goods	1994	1995
food	93,535	207,874
fruit, vegetables	78,188	64,770
potatoes	41,116	19,054
cereals	291,993	112,553
flower	248,800	69,891
sugar	46,495	104,186
beverages	3,420	738
salt	21,629	23,771
minerals	18,559	28,975
cement	83,007	91,295
bauxite	37,395	32,420
coal, coke	1,600	1,059
oil	852,567	61,936
petrochemical products	145,632	2,006
chemical products	60,869	34,813
mineral fertiliser	4,147	36,062
tyres	1,918	1,255
timer, timber products	44,830	28,862
paper	8,325	26,189
building materials	9,766	153,049
metallurgical products	334,432	55,772
non.ferrous metals	1,605	1,116
tractors	2,830	270
busses	850	1,970
cars	1,091	2,864
lorries	4,960	2,064
Total	**2,439,559**	**1,164,814**

Annex 2.1-9

Foreign trade between Azerbaijan and Georgia

(in Tons)

Type of goods	Export Georgia		Export Azerbaijan	
	1994	1995	1994	1995
food		281	513	932
tea	108	34		
tobacco			41	411
fruit and vegetable juice	785			
sugar	20			
minerals	70	11,808		6
petroleum			11,325	84,521
diesel			25,894	188,448
petrol			51	4,684
mazout	17,000		20,262	51,498
lubricants		8	1,739	12,154
gas			1,304	8,762
chemistry	277	2,975	1,956	26,964
acids	62	65	17,585	7,734
carbide	139	105		
caustic soda			2,619	1,121
hydrocarbon			7,277	10,108
ammonia	671	1,537		
spirit		1,950		
phenol	2,021	7,921		
nitrogen fertiliser	1,904	21,113		
paper	338	153	259	266
stone	294	124		
metal and metal products	8,879	17,159	285	
Total	***32,568***	***65,233***	***91,110***	***397,609***

an2-1-10

Annex 2.1-10

Azerbaijan's export of oil products

Destination	1994		1995	
	Tons	%	Tons	%
Total	***1,819,108***		***2,190,481***	
Russia	11,056	0.6	102,068	4.7
Ukraine	219,739	12.1	82,608	3.8
Belarus	7,500	0.4	177	0.0
Uzbekistan	110	0.0	108	0.0
Moldova	112,933	6.2	39,480	1.8
Kazakhstan	22,976	1.3	41,201	1.9
Georgia	59,280	3.3	364,393	16.6
Kyrgyzstan	20,600	1.1	5,669	0.3
Tadzhikistan	2,524	0.1	3,931	0.2
Turkmenistan	146,635	8.1	20,177	0.9
FSU	**603,353**	**33.2**	**659,812**	**30.1**
Afghanistan	1,591	0.1		
Lithuania	12,744	0.7	47,756	2.2
Latvia	35,683	2.0	13,464	0.6
Austria	52,998	2.9	22,355	1.0
Gibraltar		0.0	45,421	2.1
Greece	10,303	0.6	101,988	4.7
Iran	1,045,326	57.5	976,324	44.6
Italy		0.0	277,138	12.7
Poland	22,695	1.2		
UK	32,745	1.8	46,071	2.1
Non FSU	**1,214,085**	**66.7**	**1,530,517**	**69.9**

Annex 2.1-11

Development of rail freight traffic - Armenia

	ME	1989	1996	1997		2000		2010		2015	
				opt.	pess.	opt.	pess.	opt.	pess.	opt.	pess.
Total amount	,000 t	**33,868**	**1,177**	**1,238**	**1,166**	**2,269**	**1,535**	**3,357**	**2,242**	**4,238**	**2,726**
Total perform.	Mio tkm	**5,121**	**351**	**369**	**348**	**703**	**476**	**1,041**	**695**	**1,314**	**845**
Export, amount	,000 t	8,033	132	135	129	176	142	316	213	474	320
Import, amount	,000 t	18,227	511	550	514	715	617	1,072	832	1,286	957
Transit, amount	,000 t	40	0	0	0	685	170	856	360	1,070	541
Domestic traffic		*7,568*	*534*	*553*	*523*	*693*	*606*	*1,113*	*836*	*1,407*	908
Freight dispatch		*15,641*	*666*	*688*	*652*	*869*	*748*	*1,429*	*1,050*	*1,882*	1,228
Oil products	,000 t			0	0	0	0	0	0	0	0
Building materials	,000 t	6,909	116	122	119	189	149	425	260	637	338
Metal	,000 t	16	20	21	20	22	21	26	23	29	25
Cement	,000 t	1,053	130	137	133	171	152	256	198	320	228
Cereals, foodstuf	,000 t		34	34	33	37	35	47	40	51	43
others	,000 t	7,663	366	375	348	450	391	675	528	844	594
Transport distance	km			298		310		310		310	

Annex 2.1-12

Development of rail freight traffic - Azerbaijan

		1988	1995	1997		2000		2010		2015	
				opt.	pess.	opt.	pess.	opt.	pess.	opt.	pess.
Total amount	,000 t	**91,363**	**9,073**	**10,863**	**10,173**	**20,102**	**14,512**	**29,690**	**24,757**	**34,825**	**29,046**
Total perform.	Mio tkm	**41,895**	**2,409**	**2,879**	**2,696**	**8,805**	**6,109**	**13,004**	**10,423**	**15,253**	**12,229**
Export, amount	,000 t	15,859	1,277	1,270	1,251	6,454	3,572	10,668	9,008	11,201	9,458
Import, amount	,000 t	15,477	815	894	885	1,162	1,151	1,743	1,611	2,265	2,014
Transit, amount	,000 t	37,082	219	881	608	4,187	2,005	5,150	3,810	6,438	4,763
Domestic traffic		*22,945*	*6,762*	*7,817*	*7,429*	*8,462*	*7,784*	*12,129*	*10,328*	*14,921*	12,812
Freight dispatch		*39,466*	*8,429*	*9,087*	*8,680*	*14,916*	*11,356*	*22,797*	*19,336*	*26,123*	22,270
Oil products	,000 t	10,692	6,416	7,342	6,987	11,880	8,640	18,611	15,721	21,403	18,079
Building materials	,000 t	13,044	1,031	812	796	1,827	1,593	2,466	2,071	2,713	2,381
Iron ore	,000 t	697	4	10	4	22	5	30	5	33	6
Cement	,000 t	835	141	126	122	145	141	195	183	215	210
Cereals	,000 t	725	241	251	248	276	273	345	335	379	368
others	,000 t	8,294	596	548	522	767	704	1,150	1,021	1,380	1,226
Transport distance	km		265	265	265	438	421	438	421	438	421

Annex 2.1-13

Development of rail freight traffic - Georgia

		1988	1995	1997		2000		2010		2015	
				opt.	pess.	opt.	pess.	opt.	pess.	opt.	pess.
Total amount	,000 t	**36,190**	**4,700**	**4,886**	**4,390**	**9,525**	**6,086**	**15,268**	**11,605**	**17,470**	**13,700**
Total perform.	Mio tkm	**12,591**	**1,246**	**1,319**	**1,185**	**3,238**	**2,069**	**5,191**	**3,946**	**5,940**	**4,658**
Export, amount	,000 t		330	353	306	494	367	815	606	1,019	787
Import, amount	,000 t		1,225	820	603	943	724	1,179	905	1,267	995
Transit, amount	,000 t		1,775	2,245	2,050	6,011	3,263	10,525	7,995	12,104	9,595
Domestic traffic			1,370	*1,467*	*1,430*	*2,076*	*1,732*	*2,748*	*2,099*	*3,079*	2,323
Freight dispatch			1,600	*1,820*	*1,736*	*2,570*	*2,099*	*3,564*	*2,704*	*4,098*	3,110
Coal	,000 t	2,352	41	50	44	87	62	130	74	149	86
Oil products	,000 t	1,332	271	297	290	371	334	483	434	555	499
Building materials	,000 t	10,329	218	252	247	441	309	661	463	760	533
Iron ore	,000 t	5,467	80	88	86	110	103	132	123	151	142
Cement	,000 t	882	20	22	22	39	26	58	38	66	43
Cereals	,000 t	2,624	157	177	170	222	204	266	255	306	293
Metal	,000 t	1996	161	199	172	309	216	494	302	568	347
Others	,000 t		652	736	705	994	846	1,341	1,015	1,542	1,168
Transport distance	km		268	270		340		340		340	

Annex 2.1-14

Westbound traffic in Baku - Tbilisi - Poti / Batumi corridor (optimistic scenario)

	1995	1996	1997	2000	2010	2015
1 Baku - Gyandsha						
Domestic	3299	3,283	3,529	3,793	5,311	6,373
Azeri exports	952	928	947	4,734	7,811	8,358
Georgian imports	26	27	28	35	53	66
Transit	134	335	469	1,759	2,198	2,748
Azeri imports	30	30	32	33	36	38
Total	*4441*	*4,602*	*5,004*	*10,354*	*15,409*	*17,583*
2 Gyandsha - Tbilisi						
Domestic	0	0	0	0	0	0
Azeri exports	964	940	959	4,793	7,909	8,463
Georgian imports	26	27	28	35	53	66
Transit	134	335	469	1,759	2,198	2,748
Total	*1124*	*1,302*	*1,456*	*6,587*	*10,160*	*11,277*
3 Tbilisi - Batumi						
Domestic	380	399	429	515	643	740
Azeri exports	615	600	612	3,609	6,568	6,962
Georgian imports	11	11	12	14	18	19
Transit	126	315	410	942	1,224	1,592
Georgian exports	30	30	32	45	74	93
Total	*1162*	*1,355*	*1,494*	*5,124*	*8,527*	*9,405*
4 Tbilisi - Poti						
Domestic	310	326	350	420	567	652
Azeri exports	109	106	108	867	1,041	1,093
Georgian imports	3	3	3	4	5	5
Transit	28	70	151	828	952	1,047
Georgian exports	60	60	64	90	148	185
Total	*510*	*565*	*676*	*2,209*	*2,712*	*2,982*

Annex 2.1-15

Westbound traffic in Baku - Tbilisi - Poti / Batumi corridor (pessimistic scenario)

	1995	1996	1997	2000	2010	2015
1 Baku - Gyandsha						
Domestic	3299	3,283	3,447	3,481	4,525	5,431
Azeri exports	952	928	944	2,597	6,493	7,012
Georgian imports	26	27	28	31	37	43
Transit	134	335	352	1,354	1,693	2,065
Azeri imports	30	30	30	31	34	36
Total	*4441*	*4,602*	*4,801*	*7,494*	*12,782*	*14,587*
2 Gyandsha - Tbilisi						
Domestic	0	0	0	0	0	0
Azeri exports	964	940	956	2,630	6,575	7,101
Georgian imports	26	27	28	31	37	43
Transit	134	335	352	1,354	1,693	2,065
Total	*1124*	*1,302*	*1,336*	*4,015*	*8,305*	*9,209*
3 Tbilisi - Batumi						
Domestic	380	399	409	458	490	564
Azeri exports	615	600	510	1,784	5,405	5,757
Georgian imports	11	11	12	13	16	18
Transit	126	315	372	743	870	1,218
Georgian exports	30	30	32	39	64	79
Total	*1162*	*1,355*	*1,335*	*3,037*	*6,845*	*7,635*
4 Tbilisi - Poti						
Domestic	310	326	335	349	436	501
Azeri exports	109	106	98	629	768	806
Georgian imports	3	3	3	4	5	5
Transit	28	70	63	677	792	990
Georgian exports	60	60	61	80	119	149
Total	*510*	*565*	*561*	*1,738*	*2,120*	*2,452*

Annex 2.1-16

Eastbound traffic in Baku - Tbilisi - Poti / Batumi corridor (optimistic scenario)

	1995	1996	1997	2000	2010	2015
1 Gyandsha - Baku						
Domestic	676	592	621	932	1,165	1,339
Azeri imports	265	270	291	378	567	737
Georgian exports	155	154	166	224	336	403
Transit	54	55	96	386	675	843
Azeri exports	30	29	30	90	107	113
Total	*1180*	*1,100*	*1,204*	*2,008*	*2,849*	*3,435*
2 Tbilisi - Gyandsha						
Domestic	0	0	0	0	0	0
Azeri imports	293	299	321	418	626	814
Georgian exports	160	159	171	231	347	416
Transit	54	55	96	386	675	843
Total	*507*	*513*	*589*	*1,034*	*1,648*	*2,074*
3 Batumi - Tbilisi						
Domestic	195	205	220	275	371	427
Azeri imports	53	54	58	76	113	147
Georgian exports	45	45	48	67	104	125
Transit	195	191	196	245	306	367
Georgian imports	290	276	282	325	406	436
Total	*778*	*770*	*805*	*988*	*1,301*	*1,503*
4 Poti - Tbilisi						
Domestic	143	150	161	202	272	313
Azeri imports	240	245	263	342	513	667
Georgian exports	10	10	10	13	17	20
Transit	350	348	357	446	558	669
Georgian imports	610	580	377	433	541	582
Total	*1353*	*1,333*	*1,169*	*1,436*	*1,902*	*2,252*

Annex 2.1-17

Eastbound traffic in Baku - Tbilisi - Poti / Batumi corridor (pessimistic scenario)

	1995	1996	1997	2000	2010	2015
1 Gyandsha - Baku						
Domestic	676	592	603	845	1,014	1,135
Azeri imports	265	270	284	355	522	654
Georgian exports	155	154	148	170	272	327
Transit	54	55	83	323	581	726
Azeri exports	30	29	29	64	74	77
Total	*1180*	*1,099*	*1,146*	*1,757*	*2,463*	*2,919*
2 Tbilisi - Gyandsha						
Domestic	0	0	0	0	0	0
Azeri imports	293	297	312	391	574	719
Georgian exports	160	160	154	177	283	339
Transit	54	55	83	323	581	726
Total	*507*	*512*	*549*	*890*	*1,438*	*1,784*
3 Batumi - Tbilisi						
Domestic	195	196	206	237	308	345
Azeri imports	53	54	56	71	102	130
Georgian exports	45	45	46	48	63	72
Transit	195	195	198	238	285	333
Georgian imports	290	261	144	165	198	232
Total	*778*	*751*	*650*	*758*	*956*	*1,112*
4 Poti - Tbilisi						
Domestic	143	144	151	174	226	253
Azeri imports	240	244	256	320	464	589
Georgian exports	10	10	10	11	14	16
Transit	350	341	346	416	499	584
Georgian imports	610	549	302	347	417	488
Total	*1353*	*1,288*	*1,065*	*1,267*	*1,619*	*1,929*

Annex 2.2.-1

Development of rail passenger traffic in Armenia

	1995	1997	%	2000	%	2010	%	2015	%
Optimistic scenario									
Regional traffic									
Passengers (,000)	2,807	1,760	62.7	1,868	66.5	2,333	83.1	2,576	91.8
Pkm (Mio)	134.7	70.0	52.3	75	55.5	93.3	69.3	103.0	76.5
Domestic traffic									
Passengers (,000)	163	36	22.1	42	25.8	63	38.7	71	43.6
Pkm (Mio)	30.2	7.5	24.8	8.7	28.8	13.2	43.7	14.9	49.3
International traffic									
Passengers (,000)				66		136		154	
Pkm (Mio)				16.5		34.0		38.5	
Total									
Passengers (,000)	**2,970**	**1,796**	**60.5**	**1,976**	**66.5**	**2,532**	**85.3**	**2,801**	**94.3**
Pkm (Mio)	**164.9**	**77.9**	**47.2**	**99.9**	**60.6**	**140.5**	**85.2**	**156.4**	**94.8**
Pessimistic scenario									
Regional traffic									
Passengers (,000)	2,807	1,667	59.4	1,600	57.0	1,897	67.6	1,994	71.0
Pkm (Mio)	134.7	66.7	49.5	64.0	47.5	75.9	56.3	79.7	59.2
Domestic traffic									
Passengers (,000)	163	34	20.9	35	21.5	42	25.8	45	27.6
Pkm (Mio)	30.2	7.2	23.8	7.3	24.2	8.9	29.5	9.3	30.8
International traffic									
Passengers (,000)				30		74		84	
Pkm (Mio)				7.5		18.6		21.0	
Total									
Passengers (,000)	**2,970**	**1,701**	**57.3**	**1,665**	**56.1**	**2,013**	**67.8**	**2,123**	**71.5**
Pkm (Mio)	**164.9**	**73.9**	**44.8**	**78.8**	**47.8**	**103.4**	**62.7**	**110.0**	**66.7**

Note: Percentage rates refer to year 1995

Annex 2.2-2

Development of rail passenger traffic in Azerbaijan

	1995	1997	%	2000	%	2010	%	2015	%
Optimistic scenario									
Regional traffic									
Passengers (,000)	6,400	2,918	45.6	3,298	51.5	5,372	83.9	6,078	95.0
Pkm (Mio)	140.2	73.0	52.1	82	58.8	134.3	95.8	151.9	108.3
Domestic traffic									
Passengers (,000)	2,432	1,409	57.9	1,820	74.8	3,741	153.8	4,233	174.1
Pkm (Mio)	608.0	352.3	57.9	455.0	74.8	935.3	153.8	1058.2	174.0
International traffic									
Passengers (,000)	168	5	3.0	87	51.8	283	168.5	406	241.7
Pkm (Mio)	42.0	1.5	3.6	25.8	61.4	83.4	198.6	119.8	285.2
Total									
Passengers (,000)	**9,000**	**4,332**	**48.1**	**5,205**	**57.8**	**9,396**	**104.4**	**10,717**	**119.1**
Pkm (Mio)	**790.2**	**426.8**	**54.0**	**563.2**	**71.3**	**1153.0**	**145.9**	**1329.9**	**168.3**
Pessimistic scenario									
Regional traffic									
Passengers (,000)	6,400	2,304	36.0	1,975	30.9	2,348	36.7	2,468	38.6
Pkm (Mio)	140.2	57.6	41.1	49.4	35.2	58.7	41.9	61.7	44.0
Domestic traffic									
Passengers (,000)	2,432	1,335	54.9	1,269	52.2	1,995	82.0	2,097	86.2
Pkm (Mio)	608.0	333.8	54.9	317.3	52.2	498.7	82.0	524.2	86.2
International traffic									
Passengers (,000)	168	5	3.0	47	28.0	114	67.9	145	86.3
Pkm (Mio)	42.0	1.5	3.6	13.9	33.1	33.5	79.8	42.8	101.9
Total									
Passengers (,000)	**9,000**	**3,644**	**40.5**	**3,291**	**36.6**	**4,457**	**49.5**	**4,710**	**52.3**
Pkm (Mio)	**790.2**	**392.9**	**49.7**	**380.6**	**48.2**	**590.9**	**74.8**	**628.7**	**79.6**

Note: Percentage rates refer to year 1995

Annex 2.2-3

Development of rail passenger traffic in Georgia

	1996	1997	%	2000	%	2010	%	2015	%
Optimistic scenario									
Regional traffic									
Passengers (,000)	1,761	1,761	100.0	1,868	106.1	2,451	139.2	2,773	157.5
Pkm (Mio)	137.7	79	57.5	84	61.1	110.3	80.1	124.8	90.6
Domestic traffic									
Passengers (,000)	1,454	1,454	100.0	1,683	115.7	3,084	212.1	3,936	270.7
Pkm (Mio)	269.0	269.0	100.0	311.4	115.8	570.5	212.1	728.2	270.7
International traffic									
Passengers (,000)	4	4	100.0	81		166		211	
Pkm (Mio)	0.2	0.2	100.0	16.9		34.8		44.4	
Total									
Passengers (,000)	**3,219**	**3,219**	**100.0**	**3,632**	**112.8**	**5,701**	**177.1**	**6,920**	**215.0**
Pkm (Mio)	**406.9**	**348.4**	**85.6**	**412.4**	**101.4**	**715.6**	**175.9**	**897.4**	**220.5**
Pessimistic scenario									
Regional traffic									
Passengers (,000)	1,761	1,673	95.0	1,526	86.7	1,719	97.6	1,898	107.8
Pkm (Mio)	137.7	75.3	54.7	68.7	49.9	77.3	56.1	85.4	62.0
Domestic traffic									
Passengers (,000)	1,454	1,418	97.5	1,348	92.7	2,441	167.9	2,762	190.0
Pkm (Mio)	269.0	262.3	97.5	249.3	92.7	451.6	167.9	510.9	189.9
International traffic									
Passengers (,000)	4	4	100.0	33		101		114	
Pkm (Mio)	0.2	0.2	100.0	2.5		21.1		23.9	
Total									
Passengers (,000)	**3,219**	**3,095**	**96.1**	**2,907**	**90.3**	**4,261**	**132.4**	**4,774**	**148.3**
Pkm (Mio)	**406.9**	**337.8**	**83.0**	**320.5**	**78.8**	**550.0**	**135.2**	**620.2**	**152.4**

Note: Percentage rates refer to year 1995

Annex 3.2-1

Investigation criteria for the choice of a suitable enterprise form

		Limited liability company	Open stock corporation	Close stock corporation	Consortium	Limited partnership
1	**Legal and juridical basis**					
1.1	Juridical existence					
1.2	Fixed capital (type, amount, restrictions)					
1.3	Securities (guarantee etc.)					
1.4	Registration of enterprises					
1.5	Joint-Venture- suitability					
1.6	Securities for investors					
1.7	Liability					
2	**Economic / tax basis**					
2.1	Joint-Venture-suitability					
2.2	Financing possibilities					
2.3	Tax burden (type, amount)					
2.4	Taxation of foreign credits					
2.5	Tax burden and other deductions (type,amount)					
2.6	National / international subsidies					
2.7	Social acceptance					
3	**Finanancial and technical basis**					
3.1	Registration of foreign investments					
3.2	Stability of currency					
3.3	Convertibility of currency					
3.4	Credit worthiness					

Annex 3.2-2

Assessment of partial strategies per participant in a service enterprise

	Participant	Objectives of enterprise	Tasks of enterprise	Financing	Tasks	Participants	Organisation	Sales	Intersections with transport	Security
1	Railway X									
2	Railway Y									
3	Railway Z									
4	Forwarder A									
5	Forwarder B									
6	Forwarder C									
7	Port T									
8	Port Z									
9	Enterprise S									
10	Enterprise S1									
11	Enterprise S2									
12	Enterprise S3									

+++ extremely important
++ very important
+ important
O
- less important
-- not important
--- not relevant at all

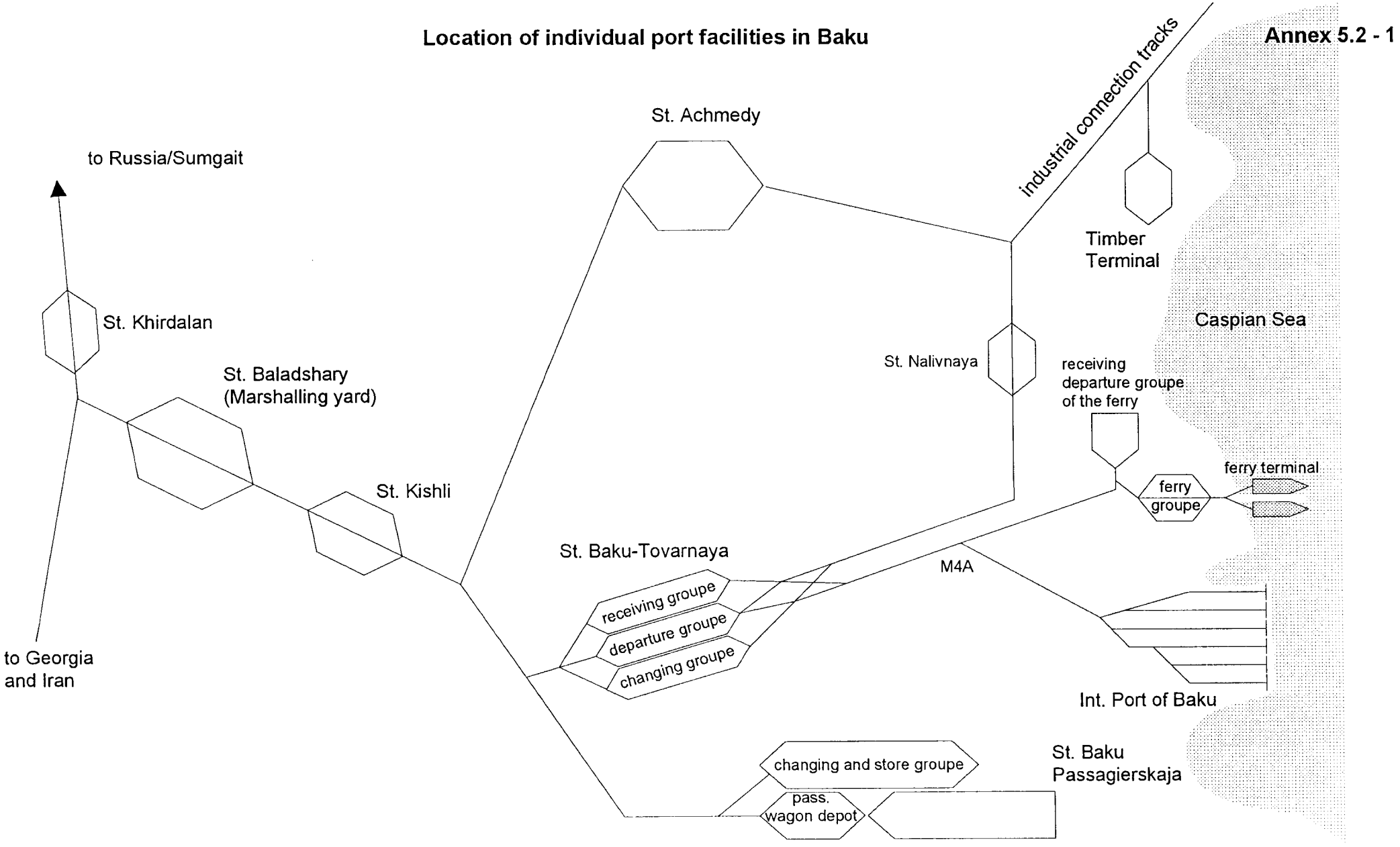
Annex 3.2-3

Connections between partial strategies

	Partial strategy	**Objectives of enterprise**	Short/medium- term	Long- term	**Tasks of enterprise**	Operational	Strategic	**Form of enterprise**	Type	Participants	**Financing**	Own capital	Outside capital	**Organisation**	Organisation of structure	Organisation of activities	EDP-Organisation
1	**Objectives of enterprise**	▨															
1.1	Short/medium- term		▨														
1.2	Long- term			▨													
2	**Tasks of enterprise**				▨												
2.1	Operational					▨											
2.2	Strategic						▨										
3	**Form of enterprise**							▨									
3.1	Type								▨								
3.2	Participants									▨							
4	**Financing**										▨						
4.1	Own capital											▨					
4.2	Outside capital												▨				
5	**Organisation**													▨			
5.1	Organisation of structure														▨		
5.2	Organisation of activities															▨	
5.3	EDP-Organisation																▨

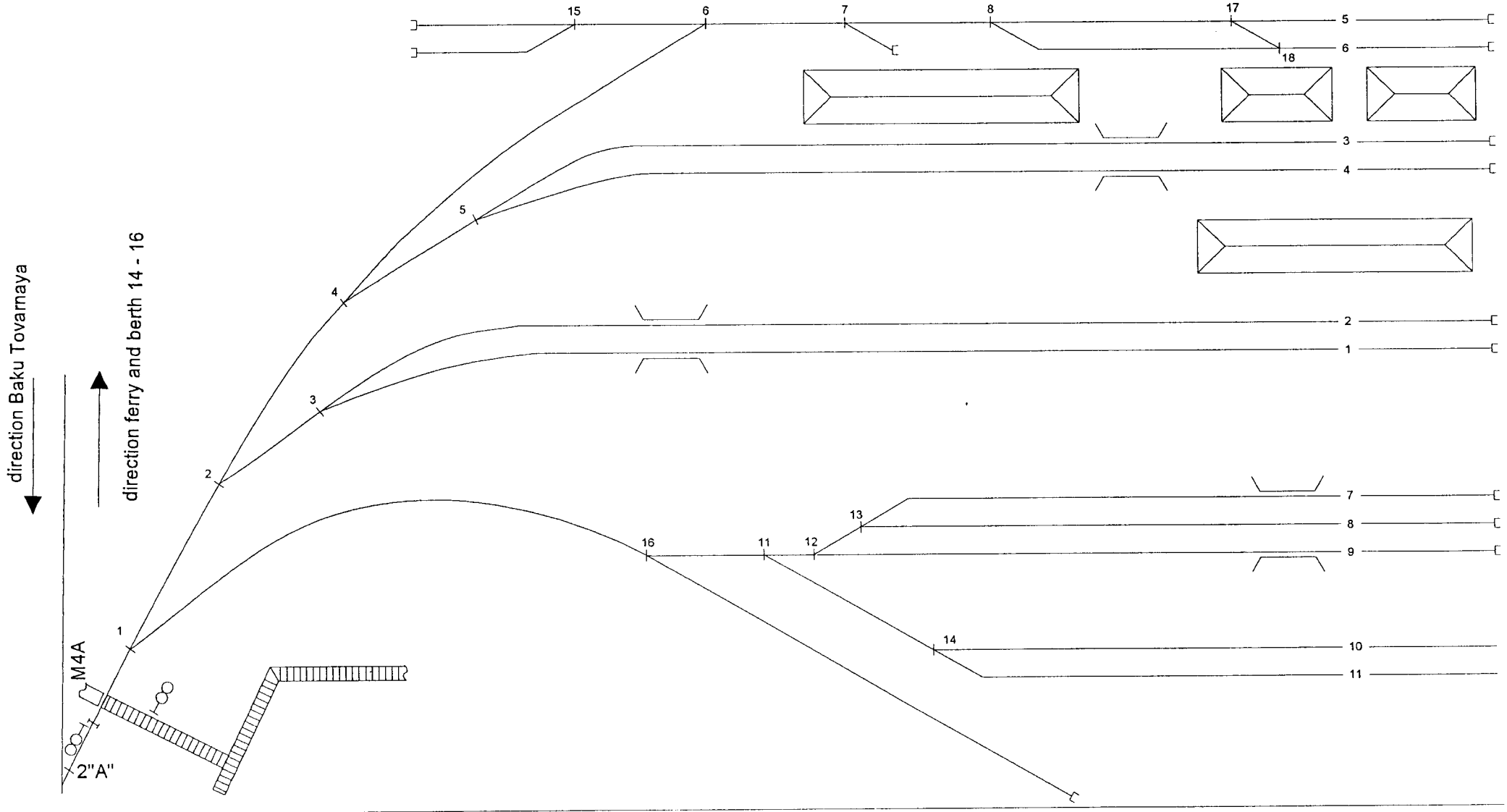
Location of individual port facilities in Baku

Annex 5.2 - 1



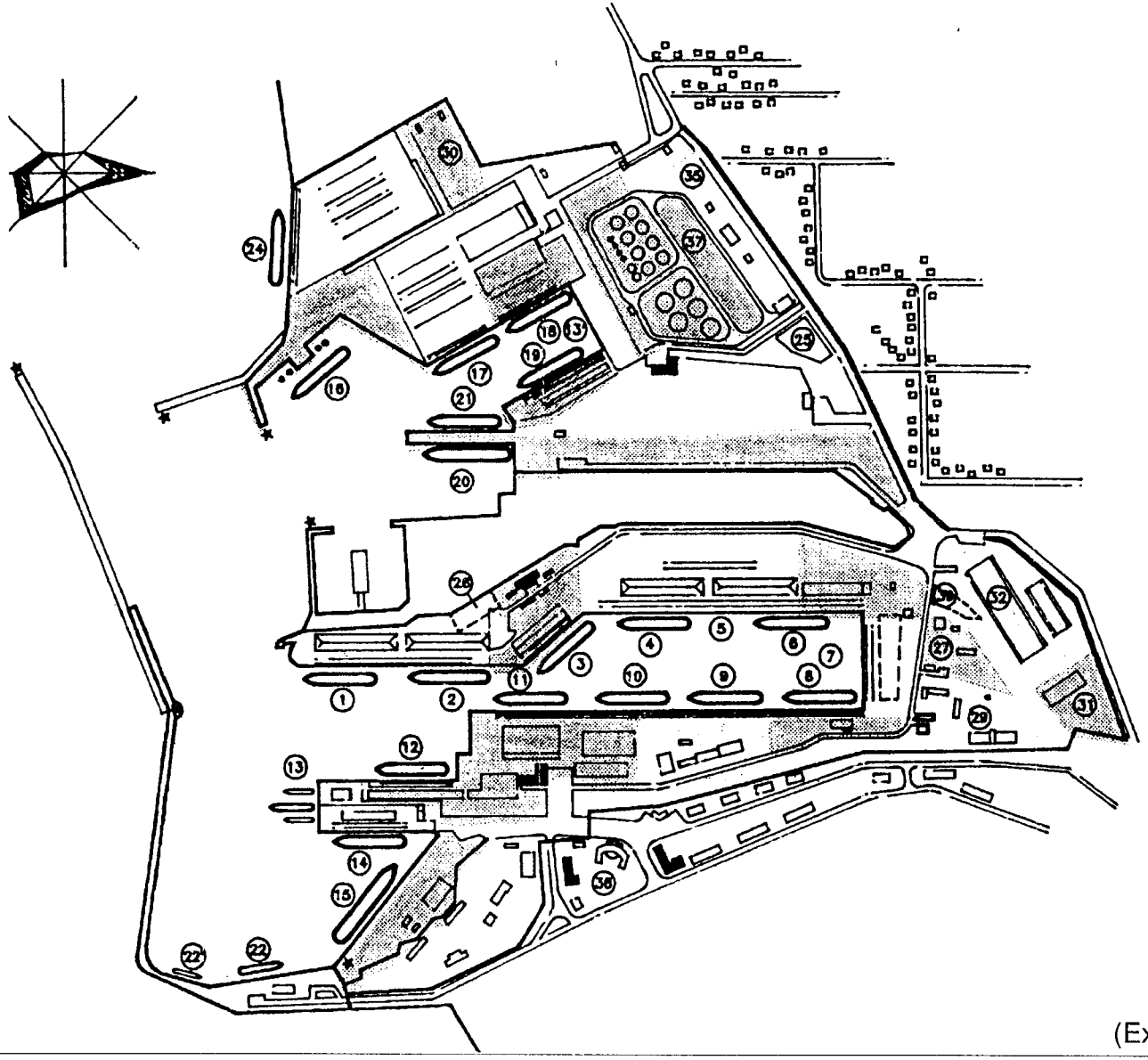
Layoutplan of the tracks in port Baku

Annex 5.2 - 2



Layout of the Port of Poti

Annex 5.3 - 1



(Explications see next page)

Annex 5.3-1

Explications

1,2	Transshipment complex for ore
3	Transshipment complex for metal and metal wares
4,5	Transshipment complex for coal
6	Transshipment complex for chemical cargo
7	Transshipment complex for drink water and alcohol drinks
8	Transshipment complex for general cargo
9	Transshipment complex for foodstuffs
10,11	Transshipment complex for grain
12	Transshipment complex for containers
13	Port fleet
14	Transshipment complex for perishable goods
15	Transshipment complex for grain
16	Oil-transshipment and bunker complex
17	Transshipment complex for containers
18	Transshipment complex for perishable goods
19	Transshipment complex for cement
20	Railway ferry
21	Motor-car ferry
22	Passenger complex
24	Building base of Administration of objects under construction
25	Facilities (constructions) of inner-port technical water supply
27	Base of small mechanisation
29	Central repair mechanical workshops
30	Purification (cleaning) facilities
31	Warehousing
32	(Consignment) Bonded ware-houses
35	Fire depot
36	Port administration
37	Oil base
39	Substation „Poti-6“