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Rail Maintenance Central
Asia: Infrastructure
Inception Report
June 1996

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For the attention of Mr D. Stroobants

Your ref	Your notice	Our ref	Contact person	Date
		A2/ 309 / 1996	Mr Kulke Mr Prescha	5 July 1996

Dear Sir :

TRACECA Rail Maintenance Central Asia: Infrastructure 2, TNREG 9310

We have pleasure in submitting five bound copies, one loose copy and one diskette of our Inception Report, English version. The translation of the report into Russian is being done at present, this version will be submitted as soon as possible.


The Inception Report takes into consideration the situation of the project as per 28 June 1996.

The current requirements according to information of the Contracting Party about the modification of contractual relations with local partners (especially in Turkmenistan and Uzbekistan) are not considered yet and will be clarified in July. The European Commission will be informed about the results by a short location report in the beginning of August 1996.

In accordance with the Work Programme the Team Leader will permanently be in the TRACECA region from the beginning of August until November 1996.

Yours faithfully,
DE-Consult
Deutsche Eisenbahn-Consulting GmbH


per proc. P. Kulke
Regional Managing Director
Europe, CIS States and
Mediterranean


by order F. Prescha
Project Manager

c.c. TACIS Units: Kazakhstan)
Kyrgyztan)
Turkmenistan) delivered by mail or hand
Tadjikistan)
Uzbekistan)

Monitoring and Evaluation Unit Central Asia - delivered by express mail to Sema Group, Brussels

REPORT COVER PAGE

INCEPTION REPORT

Project Title :	TRACECA Rail Maintenance Central Asia: Infrastructure 2	
Project Number:	TNREG 9310	
Country:	Kazakhstan, Turkmenistan, Kyrgyzstan, Tadjikistan, Uzbekistan	
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Date of report : June 1996

Reporting period : April - June 1996

Authors of report : N. D. Griffiths, Team Leader
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This project is financed by the European Union's Tacis Programme, which provides grant finance for know-how to foster the development of market economies and democratic societies in the New Independent States and Mongolia.

TABLE OF CONTENTS

- 1. Project Synopsis**

- 2. Analysis of project**
 - 2.1 Introduction
 - 2.2 Relevant Project Context, Objectives of the Modules
 - 2.3 Start Situation
 - 2.4 Present State of Project Performance, Problems Found
 - 2.5 Main Problem and Deficiencies
 - 2.6 Local Support, Commitments

- 3. Project planning**
 - 3.1 Relationship with other Projects
 - 3.2 Project Goals and Objectives, Project Approach
 - 3.3. Intended Results, Reporting

- ANNEX 1** New version of the Terms of Reference (in accordance with Addendum N° 1 to the technical assistance Contract)
- ANNEX 2** Work Programme and Tables
- ANNEX 3** CV's of Experts
- ANNEX 4** Specification of the Services of the Local Counterparts in the Project
- ANNEX 5** Selected Material Concerning Module A of the Project
- ANNEX 6** Selected Material Concerning Module C of the Project
- ANNEX 7** Selected Questionnaires and Support Guides for the Collection of Data Basis and Performance of Traffic Counts and Surveys



1. PROJECT SYNOPSIS

PROJECT TITLE	TRACECA Rail Maintenance Central Asia: Infrastructure 2
PROJECT NUMBER	TNREG 9310
COUNTRY	Kazakhstan, Turkmenistan, Kyrgyzstan, Tadjikistan, Uzbekistan

PROJECT OBJECTIVES	<p>A: Provide a feasibility study for the upgrading of the Aktau - Bejneu line in Kazakhstan.</p> <p>B: Survey of existing conditions, recommendations for investigation and improvement of the overall service quality on TRACECA rail corridor. Training for senior staff in this regard.</p> <p>C: Provide a feasibility study for the development of the Amudarya road and rail crossing at the Chardzhev site</p>
PLANNED OUTPUTS	<p>A: Feasibility study for rehabilitation of Aktau-Bejneu railway line in Kazakhstan to be produced</p> <p>B: Proposals for improvements in rail passenger and freight traffic in five countries to be produced; representatives from railway administrations of five countries to be trained in western Europe</p> <p>C: Feasibility study for rehabilitation, rebuilding or new construction of rail or combined road/rail bridge at Chardzhev in Turkmenistan to be produced</p> <p>Equipment to a total value of 240,000 ECU to be purchased and distributed to project beneficiaries</p>
PROJECT ACTIVITIES	<p>A: Preparation of the feasibility study for rehabilitation of Aktau - Bejneu railway line in Kazakhstan includes activities regarding</p> <ul style="list-style-type: none"> • Traffic Forecast • Technical feasibility • Economic and financial feasibility • Further selection criteria and ranking of alternatives • Initial engineering design



- B: Presentation of proposals for improvements in rail passenger and freight traffic in 5 countries to be produced includes activities regarding:
- Existing conditions in freight and passenger transport
 - Study visit to Europe
 - Recommendations to improve freight and passenger transport
- C: Preparation of the feasibility study for rehabilitation, rebuilding or new construction of a railway or a combined road/rail bridge at Chardzhev in Turkmenistan includes activities regarding
- Traffic and revenue forecast
 - Inspection of existing bridge and possible refurbishment
 - Review of existing feasibility study
 - Economic analysis and recommendations
 - Preparation of preliminary design documents

PROJECT STARTING DATE 22nd March, 1996

PROJECT DURATION 12 months: from March 1996 to February 1997

2. ANALYSIS OF THE PROJECT

2.1 Introduction

The TACIS-TRACECA Programme is part of the recommendations of the "Brussels Declaration" of May 1993. This was the formal statement of a conference organised by the Commission of the European Communities of the European Union (EU) and attended by representatives of eight new independent states in the southern part of the Former Soviet Union (FSU). The objectives of the conference were: i) to stimulate co-operation within the TRACECA region, especially the development and improvement of trade, ii) to promote the Central Asia - Trans Caucasian - Europe Transport corridor, iii) to identify problems and deficiencies in the trade and transport systems and iv) to define a Technical Assistance Programme to be financed by the EU.

Radical institutional transformations are taking place in the region as well as in all FSU states. The transport system has been particularly affected by these, especially the rail sector which has been fragmented into national entities. Thus, the former Soviet Central Asia Railways were separated into four new national railways (Kyrgyzstan, Tadjikistan, Turkmenistan and Uzbekistan). The Kazakhstan railway system existed already as three separate railway districts. This splitting up of the unified railway system and the creation of new independent railways or reorganisation of existing railway structures profoundly distorted the organisation of railway transport and the execution of railway maintenance, repair and replacement activities for all railways' assets in the TRACECA states.

The transport network of the TRACECA countries has been essentially oriented towards Russia. As a result, connections with other international markets were poorly developed. Tariff structures under the old system were detached from economic considerations, and it is by no means easy for the regional authorities to inaugurate a new market-based system.



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The FSU controlled infrastructure services from a series of central administrative organisations which did not fully reflect the existence of republic boundaries. When these organisations were broken up, each newly independent state had to take responsibility for its infrastructure. Many republics did not inherit people with the skills and experience which are necessary to co-ordinate and manage such services. This problem is particularly acute for railway administrations with their special need for central planning and control. Funds which had come from central sources must now be found from within each republic, but hitherto railway tariff structures had been set with little regard to financial need and no regard to either local conditions or market forces.

The need for deliberation and action to improve the total regional infrastructure, driven from both within the TRACECA Republics and the EU, was recognised in the Brussels Declaration and thus Regional sector Working Groups meet periodically as part of this programme. At these meetings a comprehensive set of specific projects has been inaugurated, including TRACECA Infrastructure Maintenance 2: Railways (Project 14 a) - TACIS Project TNREG9310. Project 14 a is concerned with the provision of Technical Assistance and Training for the repair, upgrading, replacement of fixed infrastructure and the enhancement of operations and commercial performance of railway transport services.

The present project concerns the Central Asian states in the TRACECA region: Kazakhstan, Kyrgyzstan, Tadjikistan, Turkmenistan and Uzbekistan.

The project is divided into three modules of equal importance:

- A: A feasibility study on the upgrading of the Aktau - Bejneu Line in Kazakhstan
- B: Proposals and training actions to improve the operation and commercial management of freight and passenger services on the TRACECA and Europe-Asia Routes, involving the five Central Asian TRACECA States
- C: Feasibility Study on the construction of a new combined road and rail bridge over the River Amudarya in the Chardzhev area of Turkmenistan; to replace the existing road bridge at that site and, possibly, replace the railway bridge, either immediately or at some future time.

2.2 Relevant Project Context, Objectives of the Modules

The project is divided into three modules, to run concurrently. The context of each of these modules is as follows:

Module A: Upgrading of Aktau-Bejneu Railway Line

Module A of the TRACECA Railways Study 14A - Infrastructure Maintenance 2 - is a Feasibility Study on the comprehensive upgrading of the about 450 km branch single track line Aktau - Bejneu, leading to its becoming a modern and reliable part of both the regional and national railway networks.

The line to be investigated connects further westwards toward the port of Aktau on the Caspian Sea, to the TRACECA region in the north and to the Russian border points in the north-west. It is now in a seriously poor state of disrepair.



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The requirement to examine this line was not included in the project's Terms of Reference (TOR). The TOR included the upgrading of the Sayak - Balkhash - Mointy line in the East of Kazakhstan. This change was made during the evaluation phase, at the request of the Kazakhstan government.

The methodology of Module A given in the Technical Proposal was not directly dependent on the actual line section to be addressed. Thus the general methodology described in the Technical Proposal and the contents of the work packages in the work streams of Module A remain valid for the Aktau - Bejneu section. In saying this, we assume that the Aktau - Bejneu section is in a similar technical condition as the Mointy - Sayak section and does not require a higher volume of investigation, even though it is longer. These comments of the consortium became a part of the contract with the Commission of the European Communities.

In the meantime the TOR were adapted to reflect this change. The revised TOR became part of the Technical Assistance Contract by being included as addendum N° 1. The revised TOR are enclosed in this report as Annex 1.

Module A will be divided into five Work streams (WS) each of which will comprise a set of Work Packages (WPs):

WS 1100	Traffic Forecast
WS 1200	Technical Feasibility
WS 1300	Economic and Financial Feasibility
WS 1400	Further Selection Criteria and
WS 1500	Initial Engineering Design and Final Recommendation

The main outputs of the study are:

- traffic forecasts for the line
- economic and financial analysis according to international standards
- proposals for technologically advanced solutions

Module B: *Proposals and Training to Improve Freight and Passenger Traffic on TRACECA Route (Kazakhstan, Kyrgyzstan, Uzbekistan, Turkmenistan and Tadjikistan)*

With the break-up of the Soviet Union, each of the CIS States has taken upon itself the responsibility for its own infrastructure services, including its railway network. Each state must now co-ordinate and manage each service, including the allocation of funds for day-to-day operation, maintenance, refurbishment and capital investment. The break-up of the union has also brought very significant changes in the economy of each state, especially the way in which it conducts commerce and the demands made of the various transport services. All these changes have brought new pressures on the staff of the state railway administrations. This is happening at a time when major changes are being made by transport infrastructure the world over to accord with the principles of commercial management and the demands made by the industry which they serve.

The success of a national railway administration depends to a considerable extent on the efficiency and speed with which freight and passenger traffic can be transferred from the railways system of one state to that of a neighbouring state. This is of especial importance where there is a demand for, or a potential for, international transit traffic, such as that on Europe-Asia route through Druzhba on the border between Kazakhstan and China as well as the TRACECA route with the crossing the Caspian Sea.



The demands now being made of the senior managers of the State railway and their support staff are being further increased by other changes. Governments now expect railway administrations to be commercially responsible, so that, while earlier, funds to operate a local part of the railway system were provided with little or no reference to the contribution made to the national economy, now railway management must work within budgets which reflect the revenue earned. Industry is often no longer able to pay the tariffs asked by the railway, but must ask for a competitive transport rate dictated by what the ultimate customer is prepared to pay for the product, delivered to his door. There is also increasing pressure to minimise delays to freight and passenger services. At the same time, railway companies are increasingly subject to competition from trucking firms and sometimes from air and sea transport. Much of the traffic carried by the railways must cross one or more intra-regional or international borders. Most of these borders are new and the various interests which regulate crossing by people and goods inevitably cause delay, including the interface between pairs of now independent railway administrations. For a railway to offer an attractive regional or international service, careful co-operation with contiguous railways and the control organisations is essential. Again, these activities are new to the railway managers in the TRACECA States.

This study will concentrate on the five TRACECA Republics which lie to the east of the Caspian Sea, especially on the core corridor; Turkmenbashi - Ashgabat Tashkent - Almaty - Druzhba:

- Kazakhstan (Almaty Railways, Tselinnaya Railways, Western Kazakhstan Railways)
- Kyrgyzstan (Kyrgyzstan Railways)
- Tadjikistan (Tadjikistan Railways)
- Turkmenistan (Turkmenistan Railways)
- Uzbekistan (Uzbekistan State Railway Co.)

The Central Asian TRACECA states and their railway administrations are summarised below:

Country	Territory (1000 sqkm)	Population 1994 (million)	Railway Company	Route kilometres
Kazakhstan	2,717	17.0	Almaty Railways, Tselinnaya Railways, Western Kazakhstan Railways	14,100
Kyrgyzstan	200	4.5	Kyrgyzstan Railways	400
Tadjikistan	143	5.8	Tadjikistan Railways	500
Turkmenistan	488	4.3	Turkmenistan Railways	2,200
Uzbekistan	447	20.0	Uzbekistan State Railway Co.	3,400

Within the Central Asian TRACECA region there are approximately 6 important railway border crossings, including the railway ferry across the Caspian Sea from Baku to Turkmenbashi (former Krasnovodsk) in Turkmenistan. There are about 5 crossings on the various frontiers with Russia (all with Kazakhstan). A frontier crossing was opened in 1991 at Druzhba, between Kazakhstan and China, which now allows international traffic between Europe and the Pacific coast on a new route as an alternative to the northern Transsiberian routes: the Europe - Asia line. A crossing from Iran to Turkmenistan has just been opened. The crossings with China and Iran involve gauge change which brings a range of technical and management difficulties.

This Project will examine the present methods of traffic management, train scheduling and control and existing commercial practices, identifying general areas where new methods would bring benefits to each railway administration and its customers, but also highlighting acute operating, traffic and commercial bottlenecks. The study will place special emphasis on intra-regional and extra-regional borders.



The Consultants will then organise a study tour for key officers of the various railway administrations in the region so that they can see at first-hand how two separate railway administrations in western Europe now manage traffic and deal with both competitors and customers.

Following the visit and in close collaboration with the railway administrations and staff of TRACECA, the Consultants will present a range of measures which would help the railway administration of the region to meet their changing tasks better.

To realise the objectives Module B of this Study is divided into three work streams:

- WS 2100 - The existing conditions in freight and passenger transport
 - Assessment of Current Operation Methods, Scheduling
 - Examination of Current Commercial Organisation
 - Current Tariff Structure
 - International Co-operation and Traffic Exchange
- WS 2200 - Study visit to Europe
- WS 2300 - Proposals to improve freight and passenger transport

Module C: Feasibility Study for Chardzhev Bridge

The city of Chardzhev lies on the western bank of the River Amudarya, within Turkmenistan. The border with Uzbekistan is some 20 km beyond the river.

The Amudarya Railway Bridge on the line between Chardzhev and Bukhara in Uzbekistan was built almost one hundred years ago and, although it continues to carry traffic without speed or weight restriction, there are doubts as to its medium term reliability. It comprises 25 simply supported bow-string girder trusses each with a span of 55 m. These are supported on cylindrical steel piers.

It was built during the period 1898 to 1901 when the maximum axle load was 16 tonnes. This bridge is the only railway crossing over the River Amudarya and ranks among the fifty longest railway river crossings in the world and is revered in many quarters as a classic of its type. It now carries trains with axle-loads of 25 tonnes and also carries pylons supporting high tension power lines. While there are no outward signs of distress in its structure, concern is expressed as to the present and future integrity of its foundations, its bearings and the joints in the trusses. It is only wise to consider the replacement of a bridge as old as this, especially one of such strategic importance.

The only river crossing available to road traffic is a floating pontoon bridge, installed some years ago to replace a car ferry. This is said to be unstable when used by heavy vehicles. The approach roads are not convenient to strategic traffic and are congested with urban traffic. The pontoon must be closed occasionally to allow river traffic to pass and for several days each year because of high flood water. A river crossing by night is not possible.

Concern for the longer term life of the railway bridge and the inadequacy of the road crossing have led to a feasibility study being carried out by Moscow Bridge Institute, Giprotansmost and other institutes in 1982 which considered three options, but the preferred solution was to construct a new dual mode bridge. The favoured site is close to the existing railway bridge. While the need for a new road bridge is in little doubt, the issues surrounding the proposal are clouded by an imprecise understanding of the true condition of the railway bridge and a proposal to extend the west bank line to Kerki, including a new river crossing about 200 km south east of Chardzhev.



A revised feasibility study is required to build upon the work done by Giprottransmost, by using up-to-date information as to demand by the two transport modes, giving a better understanding of the residual life of the railway bridge and present day estimates of costs, revenues and other benefits. Investment analysis and proposals for funding and implementation are also needed.

According to the TOR the Consultants see MODULE C of this assignment being divided into five distinct work streams

WS 3100	Traffic and Revenue Forecasts
WS 3200	Existing Bridge and Possible Refurbishment
WS 3300	Review of the Existing Feasibility Study
WS 3400	Economic Analysis and Recommendations
WS 3500	Preparation of Preliminary Design Documents

2.3 Start Situation

The project commenced with a two-week **Inception Mission** undertaken by the Team Leader, Mr. Griffiths, from 22nd March to 4th April, 1996.

The objectives of this Inception Mission were:

- to obtain information about the practical implementation of the project specifically in Kazakhstan and Turkmenistan, and the other three countries as far as possible
- to meet representatives of the project beneficiaries, local partners and contractors, and representatives of TACIS and other relevant bodies
- to negotiate and conclude the subcontract agreement with the local partner

The first week of the Mission was spent in Almaty, Kazakhstan, and the remainder in Ashgabat, Turkmenistan.

In accordance with the work programme the local counterpart, the Kazgiprozheldortrans Institute of Almaty, Kazakhstan, starts to work with the data collection for Modules C and A.

During the first mission of the local experts from Kazakhstan to Turkmenistan for work under Module C in the last week of May difficulties arose regarding co-operation of the Kazakh experts with the local authorities in Turkmenistan. After receipt of this information DE-Consult, as the leader of the consortium, immediately informed the EC as well as the TACIS Co-ordinating Unit in Ashgabat and sent the Project Manager, Mr. Prescha, to Turkmenistan to discuss the situation with the Turkmenian authorities and to find a solution to these problems.

As a result of this visit the Turkmenian side confirmed their mutual interest in provision of Module C. Alternative solutions for better integration of Turkmenian experts into the project were found and agreed (for details see 2.4 Module C).

2.4 Present State of Project Performance, Problems Found

MODULE A

The first material collected by the Local Partner, the Kazgiprozheldortrans Institute, has given a better understanding of the situation on the line (for details see Annex 5):



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The Aktau - Bejneu line is about 420 km long, including 403 km between the Mangyshlak station and Bejneu which are operated by the Western Kazakhstan Railways (Zapadno-Kazakhstanskaya Railways). In Bejneu the line connects to the Makat - Bejneu - Chardzhev line running on a approximately north-south axis.

Using this line, the stations on the Aktau - Bejneu line can be connected with North and Central Kazakhstan (via Makat - Kandagatch), Russia (via Makat - Atyrau) as well as the Central Asian countries (via Chardzhev and the main TRACECA corridor). At Mangyshlak station the line to the port of Aktau separates from the terminal branch line (Bejneu) - Mangyshlak - Uzen (Tenge). The line between the Mangyshlak station and the port of Aktau is a private branch line, used for freight traffic only.

At present the freight traffic volume on the Aktau - Bejneu line is comparatively low (maximum 2 couples of trains per day). Some large industrial plants are now paralysed; the development plans for chemical and oil industries are delayed. The Aktau port is in need of reconstruction to carry greater transit and import/export traffic.

The passenger traffic volume is very small. Only 2 couples of trains per day are operating on the line. Regular public passenger traffic exists only from Mangyshlak station to Bejneu (2 couples of trains per day) and to Uzen (1 couple of trains). For data concerning the actual passenger traffic volume on the Aktau - Bejneu line, its technical characteristics and a schematised diagram of the line see Annex 5.

The present condition of the track is very poor. The maximum speed allowed is only 40 - 50 kph.

The Consultant understands from the Kazakhstan Ministry of Transport and Communications that the reason for the choice of the Aktau - Bejneu line is due to the strategic importance to Kazakhstan of oilfields and oil refinery capacities along the route, plus flooding caused by changes in the level of the Caspian Sea. The oil would be despatched by rail via Bejneu; the Caspian Sea link is not important at present but could be a viable alternative for the future.

Logistically, the work on this Module will require the Consultant's experts to physically examine the rail route and its associated facilities, conduct surveys of existing traffic and make or obtain estimates for future traffic potential. Subsequently, the Consultant will determine alternative options for investment in the route, taking into account the existing and projected levels of traffic, and recommend the investment option considered to be most viable. It is planned to undertake the field missions together with experts of the local partner and officers of the railway responsible for the line.

It would appear, however, that the infrastructure for supporting the Consultant's team on-site may not be ideal. The Consultant will explore the possibility, together with the Zapadno-Kazakhstanskaya Railway and the local partner, supported of the Ministry of Transport and Communications, of arranging a rail survey vehicle, possibly with living accommodation, for the use of the project team.

The contacts with the local authorities, especially in the headquarters of the Western Kazakh Railways in Aktyubinsk, will be arranged with the help of the local partner. This will be very helpful because the Kazgiprozheldortrans Institute has a branch office in Aktyubinsk. In the last years the Institute has been involved in planning of maintenance facilities on the Aktau - Bejneu line. Thus, the necessary knowledge of the conditions of the line is available.

A general problem is the traffic forecast. The project "Regional Traffic Forecasting Model" mentioned in the TOR is running parallel with this project. Discussions with the Forecasting Team show that results needed for Module A forecasting will not be available before end of autumn 1996.



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Additionally, this project is concerned only with long-haul international traffic in TRACECA region. The domestic traffic which is of great importance on the subject line is not considered. This also concerns the forecasting for Module C. The basis for the domestic forecast will be present and historical traffic data, data concerning economical development and growth of population as well as interviews with relevant state and railway authorities and potential customers. The necessity for a passenger count on the line will be decided after the local partner has completed the collection of existing data.

The possible depth of investigation in the technical parts of the study (WS 1200 and WS 1500) will depend on the quantity and quality of the basic material (especially of railway plans and maps) available in Kazakhstan. Up to now it has not been possible to form a final opinion in this question. This will be possible only after the performance of the first field missions of the technical experts planned for August, 1996.

MODULE B

It is planned to start the concentrated work on Module B in September. During the initial phase of the project, the methodology and the logistics of this Module were discussed with the Local Partner, the Kazgiprozheldortrans Institute in Kazakhstan, and with the railway and governmental authorities in Kazakhstan and Turkmenistan visited. A short discussion was also held with the Uzbekian Railways. The principal concerns of the local authorities were questions concerning the planned study tour to western Europe.

The relatively restricted time allowance in the field for this module is a maximum of 5 weeks for each expert (September/October) and a follow-up of 3 weeks (January). Considering that a total of five countries will have to be visited, analysed and validated during this time, the Consultant is concerned about the potential for meaningful, in-depth work. It may therefore be more logical in this case to try to concentrate on certain strategic issues (e.g. improving international traffic co-operation - tariffs/operations/border formalities/accounting etc., or railway/government relationship) rather than trying to cover a large number of issues superficially. To this must be added, of course, the supply of equipment (it is a general question not related only to Module B) and selection of trainees for the study tour, including arranging the necessary letters of invitation and visas.

Transport between capitals will need to be by air (with the exception of Almaty-Bishkek, which has no air service - hire of a minibus may be required here). It should be noted that civil unrest is reported from parts of Tadjikistan.

It is planned that the Consultant's team for this module should spend about one week in each country (end September to end October); how the two remote railways in Kazakhstan (Aktyubinsk and Akmola) can be best included will be determined later in the project.

The co-operation and the involvement of local partners will be organised in different manner:

- using the general Local Partner Kazgiprozheldortrans
- using additional local Institutes by Kazgiprozheldortrans and/or the consortium directly
- using project co-ordinators/assistants (see 2.5)
- establishment of direct contacts with railway authorities.

The selection of staff to take part in the training programme (two week session in western Europe - per one week in Germany and in Austria) is an important element in the objectives of the project. It will improve the rail passenger and freight traffic especially the international traffic co-operation. For the group, it has been proposed that it must comprise a total of eight persons to accord with the TOR. It is some what difficult to understand the logic of the required composition of the group, that is, eight persons from five countries (or seven railway administrations including the three Kazakh railways). The TOR do not specify the composition of the study group.



The Aktau - Bejneu line is about 420 km long, including 403 km between the Mangyshlak station and Bejneu which are operated by the Western Kazakhstan Railways (Zapadno-Kazakhstanskaya Railways). In Bejneu the line connects to the Makat - Bejneu - Chardzhev line running on a approximately north-south axis.

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Logistically, the work on this Module will require the Consultant's experts to physically examine the rail route and its associated facilities, conduct surveys of existing traffic and make or obtain estimates for future traffic potential. Subsequently, the Consultant will determine alternative options for investment in the route, taking into account the existing and projected levels of traffic, and recommend the investment option considered to be most viable. It is planned to undertake the field missions together with experts of the local partner and officers of the railway responsible for the line.

It would appear, however, that the infrastructure for supporting the Consultant's team on-site may not be ideal. The Consultant will explore the possibility, together with the Zapadno-Kazakhstanskaya Railway and the local partner, supported of the Ministry of Transport and Communications, of arranging a rail survey vehicle, possibly with living accommodation, for the use of the project team.

The contacts with the local authorities, especially in the headquarters of the Western Kazakh Railways in Aktyubinsk, will be arranged with the help of the local partner. This will be very helpful because the Kazgiprozheldortrans Institute has a branch office in Aktyubinsk. In the last years the Institute has been involved in planning of maintenance facilities on the Aktau - Bejneu line. Thus, the necessary knowledge of the conditions of the line is available.

A general problem is the traffic forecast. The project "Regional Traffic Forecasting Model" mentioned in the TOR is running parallel with this project. Discussions with the Forecasting Team show that results needed for Module A forecasting will not be available before end of autumn 1996.



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An additional problem is the practise on all the railways to make a strong division between passenger and freight staff in the railway administrations. Thus, if the objectives of this module are to be met, it will be very difficult to restrict the participation of some railway administrations to only one study tour member.

From political and professional point of view it seems necessary to extend the number of participants from eight to eleven people. This would allow the inclusion of two experts from Kyrgyzstan, Tadjikistan, Turkmenistan and Uzbekistan plus three experts from Kazakhstan (one per railway administration). In the meetings held with the railways and state authorities, especially in Turkmenistan, this approach was confirmed. The participation of only one expert was not considered to be efficient and the inclusion of two experts, one such for passenger and freight traffic was requested. Taking into account the necessary stronger orientation on commercial activities, asked for in different meetings with the Contracting Party it would seem very useful to follow this request. Of course, an extension of the number of study tour participants would entail additional training costs (see 2.5).

The selected people should be well-aware of the objectives of the project. In addition, it would be wise to verify if the selected trainees are

- experienced and familiar in at least one of the following subjects: operation methods and commercial organization,
- ready to take part in the implementation of reforms,
- having perspective of professional development,
- able to contribute to further spreading of ideas and experience to subordinates,
- and available.

The discussions held with Turkmenian Railways corroborates the necessity of Module B and especially of the provision of the study tour. The main focus should be the questions of international co-operation of the railways in the fields of commercial performance and operational procedures. The regional railways which are now independent have strong deficiencies in these areas, in their own opinion, have a strong need for the transfer of European know-how.

MODULE C

Inception phase meetings with local governmental and railway authorities were held by the Team Leader during April 1996. In May 1996 the first visit was made to the bridge, including a crossing of the pontoon bridge (for photographs see Annex 6) and meetings between the Project Manager and local authorities (Mayor of the city of Chardzhev, local road traffic companies) took place.

Based on the Technical Proposal and the Contract, a visit to Turkmenistan by experts of the Kazgiprozheldortrans Institute was planned. The aims of the first visit were: i) to collect data according to the questionnaires prepared by the European experts, ii) to contact local authorities iii) to prepare the planned traffic counts and the bridge inspection together with Turkmenian authorities and institutes, iv) to subcontract work to Turkmenian partners within the framework of the budget given to Kazgiprozheldortrans.

During this visit of our Kazakh counterpart some problems regarding co-operation with the Turkmenian side occurred (especially with governmental and road traffic authorities). A stronger involvement of Turkmenian experts in the project was demanded, as were direct contacts with the consortium.

We immediately sent the Project Manager to Ashgabat to find a solution to these problems. This is the reason why the submission of the present Inception Report was delayed. The first missions of the technical experts and that of the economist planned in June and July were cancelled because of the failure to make the necessary preparation on-site.



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During these meetings with the Project Manager the Turkmenian side confirmed its mutual interest in a successful Module C. Different solutions for better integration of Turkmenian experts into the project, within the framework of the project budget and the work programme, have been found and negotiated. Experienced Turkmenian partners have been met, even though the TOR said, that "it is unlikely to find the necessary experience in Turkmenistan". Thus, two specialised Turkmenian railway institutes (TURKMENTRANSMOST and TURKMENZHELDORPROYEKT) as well as partners from the road network company will be involved as subcontractors of our general local counterpart. Additionally, the Turkmenian Railways, the government and the road network company have defined responsible persons for the co-operation with the consultants during the project performance. The TACIS Co-ordinating Unit was involved in the organisation of the meetings with the local authorities.

The following is a summary of important information obtained during this mission:

- There is no principle objection to the Consultant's experts physically visiting the bridge and the Chardzhev region in order to make technical and economic surveys. The existing railway bridge is protected by paramilitary guard responsible to the Railways. The head of the Turkmenian Railways emphasised that the railways can organise the necessary permissions by themselves.
- The TOR demand completion of Module C before completion of Module A and B. The problems in implementation of Module C have made this impossible. Discussions held with the Transport Department of the Cabinet of Ministers, as well as the head of the Turkmenian Railways, show that this reduced period is not an absolutely essential requirement from the Turkmenian side. They agree to an extension of the period of performance of Module C to the end of the project period. This is the only way to handle Module C taking into consideration the time loss in this inception phase and the mutual interest of Turkmenistan in this project. This approach is also supported by the TACIS Co-ordinating Unit in Ashgabat.
- The plans for the Kerki region in respect of the railway bridge on the new line from Chardzhev to Kerki, mentioned in the TOR do not replace the necessity of a railway bridge in Chardzhev; the latter being of primary importance for international traffic.
- Studying the TOR, it was understood that the cost of crossing the river is free. In reality the pontoon bridge is a toll bridge operated by the Turkmenian Inland Navigation Company. The Turkmenian authorities clearly declared in favour of toll-charges for the road part of the new bridge, there are not expected any problems. This is the basis of the optimism for financing the bridge by international financing institutes.
- It was suggested by the Cabinet of Ministers and the Turkmenian Railways that funds for the purchase of equipment in the budget be need for specific equipment, necessary for instrumental measurement and inspection of railway bridges and not for investments in computer equipment, etc.
- The consortium had the opportunity to get documents being a part of the existing feasibility study of 1982, including some further documents (list see in annex 6). The leading company of the consortium of Soviet planning institutes was Soyuzdorproyekt and not Mosgiprotrans as mentioned in the TOR. A member of this consortium was the Alma-Ata Giprotrans Institute, the precursor of the Kazgiprozheldortrans institute, the local partner of the consortium. However, it became clear that not all of the documents of the former planning institutes are available in Turkmenistan. This concerns especially background and basic material (for instance drilling plans etc.). At present it is not clear whether the available material is sufficient for the project performance. This is to be checked by the local and European experts.
- The former decision about the preferential location for the new bridge has to be examined critically, especially regarding the traffic volume (above all the heavy vehicle traffic) which is much higher today than had been forecast in 1981/82. There also should be discussions about this problem with the relevant administrations of the city of Chardzhev.
- In the last few years some inspections of the existing railway bridge have been made by specialised bridge inspection organisations (among them, experts of the Moscow Railway Institute in 1991). The results of these inspections are available at Turkmentransmost, now bound as a local partner to the consortium.



- The priority of the road traffic problems, which have now reached an absolutely unreasonable situation, is seen to be higher than the problems of the railway crossing. Because of the decreasing railway traffic volume it is expected that the remaining life age of the railway bridge will extend up to 10 or 12 years.

The logistics of this module are relatively simple: The Consultant's experts who require access to the bridge itself and who will undertake the economic and traffic analysis will be accommodated in Chardzhev and will undertake site studies as required. Chardzhev is about 500 km from Ashgabat, the capital of Turkmenistan. Regular domestic flights from Ashgabat are available. A part of the work will be done in Ashgabat in the headquarters of the railways, at the local institutes involved and during meetings with different Turkmenian administrative bodies.

The next steps are as follows:

- Preparation of the answers to the questionnaires by the local institutes and bodies now bound to the consortium;
- Conduct of a traffic census and interview survey on the pontoon bridge. The necessary survey forms are already prepared and are being discussed with the local partner. It is planned to provide the screen line count and interview survey over three days at the end of July or beginning of August. Because of the very high proportion of Iranian lorries crossing the bridge the survey forms for the drivers are also prepared in Persian (Farsi).
- Analysis of the existing studies by the local partners;
- Preparation and performance of the missions of the technical experts and the economist

A passenger count on the long-haul trains crossing the bridge is no longer planned. The reason is that the present situation is absolutely not representative of the past or the probable future conditions.

For political reasons and because of economic problems in the railway administrations as well as of missing legal and operational framework, international passenger traffic has been shrunk to a minimum for lower than the theoretical demand. A decision concerning the necessity of a passenger count on suburban trains is to be made after analysing the available statistical data.

The amount of instrumental inspection of the existing railway bridge will be limited to the necessary minimum because of the logistic problems concerning the transportation of equipment. The experts will maximise the use of results of the bridge inspections done in the last few years and provide a full visual inspection of the bridge. The need for magnetic particle and ultrasonic testing will be decided later on-site. This work can be done in the second mission of the bridge expert. The railways will support this approach by provision of data and their own experts. The human and material resources available with the subcontracted local institutes will also be used.

2.5 Main Problems and Deficiencies

Based on the research undertaken during the inception missions, it is difficult to predict the expected problems and deficiencies in anything other than broad terms.

Traffic Logistic Problems

A potential problem is the traffic situation in the five beneficiary countries and between them, particularly since two of the modules (A and C) require site work at locations remote from the capital.



The first missions have shown that there is regular air traffic inside the countries, e.g. for Module A in Kazakhstan between the capital Almaty and Aktau (former Shevtchenko) as well as Aktyubinsk (the headquarters of the Western Kazakhstan Railways). A high density service is also available between the capital of Turkmenistan, Ashgabat and Chardzhev.

Problems will arise regarding travelling between the capitals of the beneficiary countries. For example the services between Ashgabat and Almaty or between Almaty and Tashkent are very poor. Only two or three flights a week are available. Delays or cancellations of flights are usual. There are no direct connections existing between cities in Kazakhstan without going through Almaty. This is a problem for the technical experts in Module A, especially for such short-term experts like the rolling stock expert, who have to visit the Aktau - Bejneu line as well as the headquarters in Aktyubinsk.

Additionally, the quality of the local air services for flights within the countries concerned and between them is regrettably poor with a low reputation for quality of maintenance and service standards. Unfortunately, in most cases there is no alternative to flying, because the railway and bus services are also very poor (low traffic density, very low commercial speed, very long journey times). Bus or car service is only a viable alternative for travelling between Almaty and Bishkek. For travelling along the Aktau - Bejneu line it will be necessary to organise a special movement using railway rolling stock (see under Module A).

It was planned to include a permanent driver within the project budget. The experience of the inception missions showed that there would be no benefit to have a permanent driver in one place (for example in Almaty) during the whole period budgeted in the Financial Proposal. It is necessary to split this budget taking into account the needs of the Team Leader and the experts in the various places and the times required for the performance of the project.

Additionally, the ease of obtaining suitable visas for the team remains to yet be proven for Uzbekistan and Tadjikistan. The legal requirement to register for residence in Kazakhstan has already caused problems for the Team Leader during the Inception Mission. The Consultant is very grateful for the help given by the TACIS Co-ordinating Units, without which these first missions would have been very difficult.

Purchase of Equipment

One major problem that remains to be resolved is the identification of the 'project beneficiary' as far as the disbursement of the 240,000 ECU equipment budget is concerned. There are five countries (Kazakhstan, Kyrgyzstan, Tadjikistan, Turkmenistan, Uzbekistan) and seven different railway administrations (the national railways of Kyrgyzstan, Tadjikistan, Turkmenistan and Uzbekistan, as well as the three independent Kazakh railways) who could potentially benefit from this equipment.

Taking into consideration the political situation in the region and the particularly delicate relations between the countries it is very important to find a correct and acceptable basis for the division of this part of the budget. From this point of view, these funds should not be concentrated in just one or two measures which would not benefit all of these five countries. Thus, each country must have access to some of this equipment budget. The funds planned for each country must be concentrated by a way that they can maximise the way each railway can improve its organisational and commercial procedures and infrastructure maintenance. Also these funds should be used to support the traffic performance in TRACECA corridor.

After discussion with the local railway and governmental authorities in Kazakhstan, Turkmenistan and Uzbekistan and with the TACIS Co-ordinating Units in some of these countries we propose a division of the equipment budget guided by the involvement of each country in the execution of the project, as set out in the following paragraph.



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According to the TOR, the project is divided into three parts with a different level of involvement for each country and railway administration:

- Module A - involved Kazakhstan only
- Module B - all countries involved
- Module C - involved Turkmenistan only

Taking into account the different role of the countries in the project there are several methods that could be used to determine the proportion allocated to each country/railway:

Each project module to receive 33% of the total¹:

Kazakhstan 33% (A) plus part of (B)
 Turkmenistan 33% (C) plus part of (B)
 Uzbekistan, Kyrgyzstan, Tadjikistan only part of (B)

There are different alternatives to split the amount relating to Module B:

- each country the same part (1/5)
- each railway the same part (1/7), this means the share of Kazakhstan will be 3/7; the share of each other country: 1/7
- Each country to receive a proportion of the total based on its annual tonne/km carried or other similar indicators, such as square kilometrage of country, etc.

Analysing all possibilities of budget splitting between the recipient countries we prefer the following arrangement:

Kazakhstan	33.3 % (A) + 1/5 (B) =	40 %	=	(96,000 ECU)
Turkmenistan	33.3 % (C) + 1/5 (B) =	40 %	=	(96,000 ECU)
Uzbekistan, Kyrgyzstan, Tadjikistan	each 1/5 (B)	=	6.7 % each	= (16,000 ECU each)

Proposals concerning the most effective use of these funds can be made only after the first project mission of each technical expert. The proposals must be discussed with the railway authorities. It is suggested that these proposals will be included in the Project Progress Report following discussion with each railway authority in the region.

The results of preliminary discussions in Kazakhstan and Turkmenistan are given below.

- The Turkmenian Railways and the Cabinet of Ministers would prefer to receive equipment, which is necessary for instrumental measurement and inspection of railway bridges. Their first draft of a list of such equipment is included in Annex 6. During later phases of the project the expatriate and the local experts will undertake together an evaluation of this list and propose a specification.
- The Kazakh side would prefer to procure specialised computer hard- and soft-ware for computer aided design. This would be used to prepare of preliminary and detailed design documents for building and reconstruction of railway facilities and installations.

Both these approaches would be helpful in enabling the railways to create more powerful structures for infrastructure management and maintenance and to strengthen their independence from Russia.

¹ on the basis that each module is supposed to be equally weighted (according to TOR).



From the present position, it would appear useful for the three remaining railways to obtain computer systems to support for the railway management, especially to improve the work of freight and passenger departments (following the aims of Module B).

In the next phases of the project these first ideas will be discussed in depth.

As set out in the comments on TOR, presented in our offer, we understood from the TOR that the equipment necessary for the project office (Personal computer and office software) would be a part of the budget for equipment, which will be passed into the possession of the recipient of the services after the termination of the consultancy contract. After completion of the project inception missions we propose in agreement with our local partner to minimise the purchase of such equipment.

It is planned to obtain only computer equipment and office software for the project office in Almaty. Equipment for temporary field offices will not be obtained. Necessary equipment will be hired locally (especially using of copy and fax machines) or brought along by the experts. Concerning the purchase of a personal computer with necessary accessories and software official offers were obtained from four local computer suppliers. The amount varied between 4,500 and 6,000 USD, including full official guarantees of service. The necessary steps for the procurement of this equipment will be put in hand following the rules of the EC.

Study Tour Participation

As mentioned under 2.4 - Module B it is necessary to increase the number of participants to give a minimum of two people per country.

The extension from eight to eleven people entails additional training costs as follows:

Trainees Flights	3 x 2,600	=	7,800 ECU
Local Transport	3 x 150	=	450 ECU
Per Diem	14 x 140 x 3	=	5,880 ECU
Total			14,130 ECU

There will be no additional demand for interpreter and special training costs. The contractors will try to cover these costs by shifting funds from other cost heads and using a part of the head "Miscellaneous". At present it could not be absolutely guaranteed that these measures will cover the additional obligation, taking into consideration other factors making demands on these reserves (e.g. additional mission of the Project Manager for negotiations with local counter parts, apart from Kazakhstan, that were not foreseen in the budget). A decision can only be included in the submission of the progress report. The solution might be by covering of remaining additional costs by taking funds from the equipment budget or by additional financing by the Contracting Party.

Deployment of Experts

The experience of the first phases of the project shows that it is absolutely necessary to involve a Project Manager speaking fluent Russian who is also concerned with the goals and the proposed methodology of the project so that he can assist the Team Leader or to substitute for him during phases of his absence. The problems in the starting phase of the project concerning the additional negotiations with local authorities confirmed this approach. Mr. FRANK PRESCHA of DE-Consult, involved in the back stopping of this project will undertake this task. The effort of Mr. Prescha will be limited, however, and covered financially by partial shifting of time from other expatriate experts (team leader, economist, etc.).



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The engagement of the two infrastructure experts, Mr. KONTUR and Mr. WOGOWITSCH, during the execution of Module A of the project will be changed. Mr. Wogowitsch will fulfil the position "Infrastructure specialist (Track)" with an amount of 2.5 man-month and Mr. Kontur the position "Infrastructure specialist (Permanent way, stations)" with one man-month effort.

In consequence of the delaying of starting Module C in Turkmenistan caused by the problems described above the bridge expert Mr. STAINDL is no longer available for the project because an overlap with other assignments has arisen. The Austria Rail Engineering, Vienna, proposes Mr. KRALL to replace Mr. Staindl. Mr. Hans Krall is a very experienced bridge engineer. He is skilled in maintenance and repair of both road and rail bridges. His professional experience record includes leading positions in bridge rehabilitation and new bridge design in a wide range of projects and countries. He is familiar with difficult local infrastructural and logistic circumstances, having been responsible for projects in Iran, Iraq, India and other countries.

Additionally, we are informed by SYSTRA that there are problems concerning the participation of Mr. CANCALON and Mr. CHARTIER. Unfortunately, the SYSTRA is not able at the moment to finally resolve this problem. We will inform the Contracting Party of the outcome as soon as possible and seek their approval.

The CV's of Mr. Krall and Mr. Prescha are enclosed in Annex 3.

Special Problems of Module C (Chardzhev Bridge)

The planned strategy for the execution of the study as set out in the Technical Proposal includes the involvement of the local partner, the Kazgiprozheldortrans Institute, as a general local partner, which is responsible for any subcontracting necessary within its own responsibility and the planned budget framework.

During the first months of project this proved to be impossible due to various political and logistical reasons. After negotiations with Turkmenian governmental authorities, Turkmenian railways and various institutes a solution was found which gave a greater involvement for Turkmenian local experts, by entering into contract with two railway institutes and other similar bodies.

Taking into consideration the problems mentioned above, it will be necessary to extend the time available for completion of Module C to the full period of the overall project. During discussions held with the Project Manager the Transport Department of the Cabinet of Ministers, the head of the Turkmenian Railways as well as the TACIS Co-ordinating Unit all agreed to an extension of the period of performance of Module C.

The consortium was able to obtain parts of the existing feasibility study of 1982 (only in Russian). It is not possible at present to estimate definitely whether the documents available are sufficient for the purpose of this study. It might be necessary to obtain additional material not available in Turkmenistan. This is only available at the legal successors of the former Soviet institutes involved in the feasibility study. It was emphasised that European consultants should under no circumstances ask for these documents in Moscow. If necessary, the documents must be obtained by the Turkmenian or the Kazakh side. Funds for obtaining those documents were not a part of the planned budget.

Operational Budget Management

The present situation in the region, identified during the inception missions, especially concerning the problems of regional co-operation of experts and institutes of the different Central Asian countries means that some of the Consultant's proposals are not practicable, particularly the idea of concentration of local effort in the project office organised in the building of the Kazgiprozheldortrans Institute in Almaty.



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It became imperative to obtain the reaction of local people on their own problems in the other countries of the region. For this reason it has become necessary to use temporary local staff in each country. Thus, the planned position of a "Local Assistant" will not be used full-time at Almaty, and it will be split into a number of temporary project co-ordinators/assistants in various places. This concerns also the post of driver.

The consortium will try to cover the additional costs for: i) additional demand for negotiations with the local authorities for subcontracting of local partners and monitoring their work resulting from events outside the control of the consortium (at the request of the EC and the TACIS Co-ordinating Units), ii) extension of the number of study tour participants by shifting funds between other sections of the budget and/or using the head "Miscellaneous". The Contracting Party will be kept informed.

2.6 Local Support, Commitments

During the Inception Mission, enquiries were made to determine the extent to which information and data would be forthcoming from the railway administrations. In both Turkmenistan and Kazakhstan, such information was promised without restriction, but it remains to be seen whether this will indeed be forthcoming. This should be seen as a major risk to the success of the project, as should access to the bridge at Chardzhev (see above).

In general the local operators (railways and governmental bodies) in Kazakhstan and Turkmenistan have already started giving support to the activities of the consultants. The work within the other countries will start in August.

The Consultant has successfully concluded an agreement with Kazgiprozheldortrans Institute of Almaty, Kazakhstan, who will act as the local partner for the project.

A total of 40 man-months of involvement of local staff is included, not just in Kazakhstan but also in the other four beneficiary countries. Additionally, the Consultant will maintain a local office in Almaty at the Institute's premises. The address is as follows:

480016 Almaty, Pushkin str. 2
at Kazgiprozheldortrans Institute
Contact Partner: Mr. Kasyanov (Vice Director of Kazgiprozheldortrans)
Project Secretary: Mrs. Gulsuya Medyebayeva

Fax: (++3272) 30 44 87
Tel. (++3272) 60 47 28
(++3272) 60 45 68 (Mrs. Medyebayeva)

The Consultant will also procure the services of interpreters and drivers in each of the beneficiary countries as required.

Work by the Institute has commenced with the collection of basic data for Module A and C in May 1996. The first (unsuccessful) Mission of the Kazakh experts to Turkmenistan for Module C took place in the end of May.

After discussion with the Turkmenian authorities and in addition to the agreements with the Kazakh institute, the consortium entered into contacts with the Turkmentransmost and the Turkmenzheldorproyekt institutes as well as with the state-owned road network company. In addition to this, was agreed that local project co-ordinators of the Turkmenian Railways for Ashgabat and for Chardzhev will work within the project.



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3. PROJECT PLANNING

3.1 Relationship with other Projects

The Team Leader and/or the Project Manager are both working in co-ordination and have held meetings with the Project Manager or other representatives of the related TRACECA projects, in particular:

- Traffic Forecasting Model
- Maintenance of Rolling Stock (railways)
- Forwarding Multimodal Transports Systems

The co-ordination with the following TRACECA projects must be insured throughout the execution of this project:

- Trade Facilitation, Customs Procedures & Freight Forwarding
- Transport Legal and Regulatory Framework
- Port Network Plan and Improvement Programme

3.2. Project Goals and Objectives, Project Approach

The project goals and objectives as well as the project approach are summarised by module in point 2.2 "Relevant Project context, objectives of the Modules" of the present report. The present state of project execution as well as the necessary supplements and changes are described in point 2.4 "Present state of project performance, problems found" and point 2.5 "Main problems and deficiencies".

The schematised work programmes are given in figures 1-3 of Annex 3. Fundamental changes of the work programme, as given in the Technical Proposal; that is serious changes such as cancellation, replacement or new definition of planned Work Streams or Work Packages have not yet been necessary. The only major risks in this relation can be only the problems of sufficiency of the documents available for Module C and the technical and logistical preconditions for inspection of the existing railway bridge (see above). Alterations necessary to reflect changing circumstances were outlined under point 2.4.

In the Technical Proposal, the study was divided in seven general phases. Taking into consideration the experience of the Inception Phase, it is necessary to state this division of the work more precisely and adapt it to the situation found on site as follows.

Phase 1	Inception Phase	<i>Month 1 -3</i>
Phase 2	Data collection Phase by local experts	<i>Month 2 - 5</i>
Phase 3	Phase of technical and economic surveys by the expatriate experts (with assistance of local experts)	<i>Month 5 - 7</i>



Phase 4	Phase for examination of problems found and development of proposals and technical solutions	<i>Month 6 - 8</i>
Phase 5	Staff Training Phase (Module B)	<i>End of Month 8 and Beginning of month 9</i>
Phase 6	Phase for completion of technical documentation and outline and discussion of improvement measures	<i>Month 8 - 11</i>
Reporting	Preparation and submission of Draft Final and Final Reports	<i>Month 11 - 12</i>

Phase 1 Inception Phase

The main task of this phase was the creation of conditions for work by the team members. This has been carried out by the Team Leader and the Project Manager for all modules, who also organised the involvement of the local counterparts. Another task was the preparation of questionnaires and work programmes by the technical and economic/financial experts

This phase has been extending because of the problems of implementation of Module C and parts of Module B, especially in Turkmenistan, described above. The implementation of the next phases for Module B for the countries not involved in Modules A and C will take place in August, 1996

This phase included discussions with relevant local representatives by the Team Leader and the Project Manager during their inception visits. The main contacts made are summarised below:

Country	Name of the main local representative met	met by
Kazakhstan	Mr. PANOV, Yuri Deputy Minister of Transport and Communication	Mr. Griffiths
Kazakhstan	Mr. SEGAL, Ilya P. Director of the Railway Department Ministry of Transport and Communication	Mr. Griffiths, (Mr. Prescha)
Turkmenistan	Mr. YAZBERDYEV, Meret S. Head of the Transport and Communications Department in the Cabinet of Ministers	Mr. Griffiths Mr. Prescha
Turkmenistan	Mr. KHALIKOV, Hudaykuli Director of the Turkmenian Railways (TDDY)	Mr. Griffiths Mr. Prescha
Turkmenistan	Mr. KRASNOUSOV, Boris A. Director of Turkmentransmost	Mr. Prescha
Turkmenistan	Mr. SHENIN, Valeri V. Director of Turkmen Railway Project (Turkmenzheldorprojekt)	Mr. Prescha



Turkmenistan	Mrs. BYASHIMOVA, Mivegul Head of the Department for Foreign Economic Relations of the Turkmenian Railways (TDDY)	Mr. Prescha
Turkmenistan	Mr. VOLODIN, Vladimir F. Vice President of the Turkmenautoellari group (State enterprise for road network)	Mr. Prescha
Turkmenistan	Mr. BAZAROV, Geldymurat N. Mayor of the City of Chardzhev	Mr. Prescha
Turkmenistan	Mr. SHIPAYEV, Akmurat A. Director of the Chardzhev freight traffic company N° 15	Mr. Prescha
Uzbekistan	Mr. Gubatchov, Vladimir A. Deputy of Chief of Department of International Relations Uzbekistan Railways	Mr. Prescha

Furthermore, meetings were held with the TACIS Co-ordinating Units in Kazakhstan (Mr. MAHY) and Turkmenistan (Mr. BERDYEV, Mr. SPREY, Mr. BALLARD).

During this phase an agreement was concluded with Kazgiprozheldortrans Institute of Almaty, Kazakhstan, who will act as the main local partner for the project. For the specification of the services of Kazgiprozheldortrans in the project see Annex 4.

Additionally, agreements with Turkmentransmost, Turkmenzheldorprojekt as well as the State enterprise for road network have been made. Short descriptions of both companies mentioned first are enclosed at Annex 4.

Phase 2 Data collection Phase - by local experts

This phase was prepared by the expatriate experts carrying out questionnaires and support guides for the collection of basic data and performance of traffic counts and surveys. The documents were translated into Russian and discussed with the local counterparts responsible. At present the work on the questionnaires is going on (Module A, Module C and Kazakh part of Module B). This phase includes also the preparation for, and performance of, necessary traffic counts and surveys (see under 2.4)

A general problem in this connection is the translation of documents into the Russian language which is necessary because of the low level of English knowledge in the region and especially among the railway staff. It has been found to be very difficult to translate highly technical documents such as questionnaires and guide supports into correct Russian.

Selected important questionnaires and guide supports are enclosed as Annex 7.

Phase 3 Phase of technical and economic surveys - by the expatriate experts (with assistance of local experts)

The main tasks in this phase are:

- Assessment of present traffic volume and traffic flows on the Aktau - Bejneu line (WP 1110)
- Analysis of economic development and the transport system in the whole of Kazakhstan as well in the Western Kazakhstan region (WP 1120)



- Survey of existing situation of the Aktau - Bejneu line concerning the present technical state (track and civil construction, stations installations, signalling and safety installations, telecommunication installations, rolling stock and rolling stock maintenance facilities) of the line (WP 1210)
- Analysis of former development plans of the Aktau - Bejneu line (WP 1220)
- Assessment of present local construction, equipment and maintenance cost levels (WP 1310, WP 1320, WP 3410)
- Assessment of current operation methods and scheduling of freight and passenger traffic (WP 2110)
- Assessment of current commercial organisation of freight and passenger traffic (WP 2120)
- Examination of current tariff structure (WP 2130)
- Evaluation of problems of international railway co-operation and border crossing railway traffic (WP 2140)
- Survey of road and rail traffic data related to traffic flows crossing Chardzhev bridge (WP 3110)
- Assessment of the present technical situation of the existing railway bridge over the Amudarya river near Chardzhev (WP 3210)
- Evaluation of maintenance procedures used by Turkmenian Railways (WP 3220)
- Review of existing feasibility study done by former Soviet institutes in 1992 concerning technical and economic aspects (WP 3310, WP 3320)

Further information concerning changes found necessary and a more detailed understanding of the work involved, which might change the concept of the work to be done as foreseen in the Technical Proposal have been given in point 2.4.

Phase 4 Examination of problems found and development of proposals and technical solutions

The main tasks in this phase are:

- Calculation of future traffic volume (WP 1130)
- Identification of bottlenecks and definition of upgrading strategies for the Aktau - Bejneu line for all elements investigated in Phase 2 (WP 1230)
- Definition of volume of repair and reconstruction works on the Aktau - Bejneu line (WP 1240)
- Definition of construction, equipment and maintenance funds needed for upgrading of the Aktau - Bejneu line (WP 1320, WP 1330)
- Examination of further selection criteria for decision making concerning the strategy to upgrading the Aktau - Bejneu line (WP 1410)
- Development of study visit programme (WP 2210)
- Forecast of demand for crossing the Amudarya river near Chardzhev and forecast of revenue generated from tolls for using the new bridge (WP 3120, WP 3130)
- Evaluation of volume of necessary repair works on the existing railway bridge (WP 3220)
- Assessment of feasibility of life extension based on an agreed definition of the remaining life age (WP 3230)
- Estimation of investment and operating costs for the new bridge (WP 3410, WP 3420)

Phase 5 Staff Training Phase

This phase includes a two weeks study tour visiting Germany and Austria for senior staff of the railway administrations of the five countries investigated in this project. The goal of the study tour is to show the participants the organisation for traffic and operation management of western railway companies. An equal portion of the study tour will take place in Germany at the German Railway Company (D.B. AG), organised by DE-Consult, and in Austria at the Austrian Federal Railway (Ö.B.B.), organised by ARE.



This project is financed by the European Union's Tacis Programme, which provides grant finance for know-how to foster the development of market economies and democratic societies in the New Independent States and Mongolia.

The core of the programme consists in the following key parts:

- Operational traffic scheduling
- Rolling stock allocation and Staff rostering
- Monitoring the execution of train service
- International freight traffic
- International passenger traffic
- Rolling stock use and maintenance in international traffic
- Commercial marketing
- Competition with other transport modes
- Co-operation between EU railways

The questions concerning the selection of staff to take part in the training programme and the number of participants are sufficiently described in points 2.4 and 2.5

Phase 6 Completion of technical documentation and outline and discussion of improvement measures

This phase aids the preparation and discussion of the final conclusions based on the finalised economic calculations (cost-benefit analysis) and the preparation of the initial design documents as required. The discussions with the local authorities will take place during the final missions of the technical and economic experts.

The main work packages concerned in this phase are as follows:

Technical tasks:

- Final description of proposed works for upgrading the Aktau - Bejneu line (WP 1250)
- Initial design and project plan for upgrading Aktau - Bejneu line (WP 1510)
- Preparation of preliminary design documents for Chardzhev bridge (WP 3500)

Economic/Financial tasks:

- Determination of economic and financial profitability of upgrading the Aktau - Bejneu line (WP 1340, WP 1350)
 - Ranking of alternatives; recommendations and proposals concerning the upgrading of Aktau - Bejneu line (WP 1420, WP 1540)
 - Financing strategy and programme of upgrading the Aktau - Bejneu line (WP 1530)
 - Recommendations to improve freight and passenger transport on TRACECA corridor concerning operation, commercial performance and tariffs (WP 2310, WP 2320, WP 2330)
- The questions of railway organisation and legal protection will be investigated only to a strictly limited extent to avoid overlaps with other TRACECA projects.
- Cost-benefit-Analysis for the Chardzhev bridge (WP 3430)
 - Financing strategies and plans for the Chardzhev bridge, final recommendations (WP 3440, WP 3450)

3.3. Intended Results, Reporting

The project results as described in the Technical Proposal (Annex B to the contract) and commented in this report taking into account necessary changes based on the situation found, will be presented in three reports: i) Inception Report, ii) Project Progress Report, iii) Draft Final and Final Report.



The Inception Report has to be issued after two months of the start of the project. The problems which have arisen regarding project implementation of Module C, as described above, have caused a delay of about one month in the submission of the English version. The Contracting party was kept informed about this situation. The translation of the report into Russian is being done at present, this version will be submitted as soon as possible.

Following the TOR, the project Progress Report has be submitted at the end of month 6. It will cover technical progress to that date. Taking into consideration the delays in the inception phase it is sensible to move the transmission of this report to the end of month 7 to report on phases 2 and 3 as well as the progress in phase 4.

The Draft Final Report will be submitted at the end of month 12.

After month 12, two weeks effort by the Team Leader are foreseen for finishing of the Final Report as required in the TOR.

The necessary plans and diagrams illustrating the project execution are enclosed in Annex 2



This project is financed by the European Union's Tacis Programme, which provides grant finance for know-how to foster the development of market economies and democratic societies in the New Independent States and Mongolia.

ANNEX 1

New version of the Terms of Reference
(in accordance with Addendum N° 1 to the
Technical Assistance Contract)

EUROPEAN UNION - TACIS

Technical Assistance to the Southern Republics of the CIS
and Georgia - TRACECA

TRADE AND TRANSPORT SECTORS

Terms of Reference

for

Infrastructure Maintenance 2 :

- Feasibility study for upgrading of Aktau - Bejneu line
- Proposals and Training to improve Freight and Passenger traffic on Traceca route
- Feasibility study for Chardzhev bridge

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Railways

Final Recipients:
TRACECA Region Ministries of Transport

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Infrastructure Maintenance 2
+Proposals and Training to improve Freight and Passenger traffic on Traceca route
-
Railways
(TRACECA Project No. 14a)

CONTENTS

- 1. Introduction and Background**
- 2. Project Objectives**
- 3. Module A : Feasibility study for the upgrading of the Aktau - Bejneu line in Kazakhstan**
- Module Objectives and Scope of Work
- 4. Module B : Proposals and Training to improve the freight and passenger service on Traceca and Europe-Asia route from operational and commercial point of view**
- Module Objectives and Scope of Work
- 5. Module C : Feasibility study for a key bridge on Traceca route**
- Module Objectives and Scope of Work
- 6. Other Related Projects**
- 7. Local Participation**
- 8. Foreign Expertise**
- 9. Logistics**
- 10. Time Table and Reporting**

611

1. Introduction and Background

1.1 During May 1993 a conference was held in Brussels organised by the Commission and attended by authorities of the eight Republics of the south of the former USSR:

- Armenia,
- Azerbaijan,
- Georgia,
- Kazakstan,
- Kyrgyzstan,
- Tadjikistan,
- Turkmenistan,
- Uzbekistan.

They are the Beneficiary States of this programme.

The objectives of the conference were :

- to stimulate cooperation among the participating Republics in all matters pertaining to the development and improvement of trade within the Region
- to promote the Central Asian - Trans Caucasian - Europe Transport Corridor
- to identify problems and deficiencies in the Region's trade and transport systems
- to define, in terms of contents and timing a Technical Assistance Programme to be financed by the European Union (EU).

TRACECA (Transport Corridor Europe Caucasus Asia) was thence created as a component of the TACIS interstate programme.

1.2 The "Brussels Declaration" issued at the conclusion of this conference recommended the European Union to address in the TACIS programme variously expressed needs for feasibility studies and technical assistance projects.

Regional sectoral Working Groups (trade, rail, road, maritime), composed of experts and officials from each TRACECA state and the EU, have been established as part of the TRACECA programme. They meet periodically in the Region. They have inaugurated specific projects including this present one, and will monitor results.

A strategic study for Central Asia has recently been completed by the EBRD under TACIS financing (see 6. Other Related Projects).

1.3 National and Regional Technical Assistance projects carried out, approved or prioritised to date, are mostly aimed at halting a deterioration of the existing transport system due to maintenance difficulties, and obsolescence. Few consider reinforcing capacity. In fact transport demand has declined since the break up of the FSU.

Radical Institutional transformations are taking place in the region. The transport system has been particularly affected by these, especially the rail sector which has been fragmented into national entities.

1.4 The splitting up of the FSU and the creation of new independent railways profoundly distorted the organisation of railway transport and the execution of railway maintenance, repair and replacement activities in the TRACECA states.

Tariff structures under the old regime were detached from economic considerations. It is by no means easy for regional authorities to inaugurate a market-based system.

1.5 This project is aimed to provide Technical Assistance and Training to all rail organisations in the region in the following activity areas :

- infrastructure maintenance, repair and upgrading
- operations and commercial performance of railway transport

1.6 After consultation of the TRACECA states, and taking into account the restructuring efforts to be addressed and / or already under way, three Modules were identified for execution under the present project (identified as Modules A to C hereafter), budgetted at 1.2 Mecu in total :

MODULE A : Feasibility study for the upgrading of the Aktau - Bejneu line in Kazakhstan

MODULE B : Proposals and Training to improve the rail freight and passenger service on Traceca and Europe-Asia routes from operational and commercial point of view

MODULE C : Feasibility study for a key bridge on Traceca route: Including the full inspection of an existing rail bridge, and review of an existing feasibility study for a new road-rail combined bridge over the Amudarya river (Chardzhev area) in Turkmenistan

2. Project Objectives

2.1 The general objectives of this project are threefold :

- (i) Provide feasibility study for the Aktau - Bejneu line upgrading.
- (ii) Survey, training and recommendations to investigate and improve the overall rail traffic service quality on TRACECA and Europe - Asia main rail route
- (iii) Feasibility study for the development of the Amudarya road and rail crossing at the Chardzhev site

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2.2 Proportional balance of modules in the total project

The three modules are equally balanced in the project.

2.3 The consultant will clearly specify in his proposal the nature and the cost of equipment and supplies, training aids, hardware and software that he intends to deliver to the beneficiaries to support the implementation. It is suggested that 20% of the total budget of the project will be used to this purpose.

3. **MODULE A :** **Feasibility study for the upgrading of the Aktau - Bejneu line in Kazakhstan**

3.1 Introduction

The Aktau - Bejneu single track line is an essential part of the TRACECA and Europe - Asia main rail routes. It connects further westwards towards the port of Aktau on the Caspian Sea, to the Traceca region north and to Russian border points in the north-west.

Improving transport capacity on east-west links fits in the framework of national and regional developments. At the purely national level, Kazakhstan wants to improve an east - west route, the only alternate today being a long detour to the north passing over Russian territory. Investments for the port of Aktau are already planned.

The Aktau - Bejneu single track section is about 450 km long and in a serious state of disrepair.

3.2 Objectives and Main outputs

Provide feasibility study for the Aktau - Bejneu line upgrading.

The following outputs are judged to be the most important :

- Traffic forecasts are to be worked out very thoroughly
- Economic and financial analysis is to be carried out according to international standards, and should be linked to the possible commercialisation and restructuring of Kazakhstan railways
- Technologically advanced solutions are to be proposed.

Design work is not the core part of the technical assistance effort

111

3.3 Scope of Work

The feasibility study for the Aktau - Bejneu line upgrading will include :

3.3.1 Traffic forecasts

Traffic volumes (tonnage, number of trains, etc.) on the rail line shall be identified per line section for the years ahead. This estimate will be based upon economic analysis, e.g. the localisation of the potential customers and the volume of through traffic, taking into account different hypothesis.

Particular attention has to be paid to the effect of variations of the general level of traffic, due to changes in the execution schedule of other transport infrastructure upgradings (e.g. port of Aktau, etc.).

This part of the work should be worked out very thoroughly. The consultant will rely upon locally gathered information, information available from other projects (see 6. Other related projects), and especially take into account the international dimension of the future traffic on this line.

3.3.2 Technical feasibility

A description and survey of the existing situation of infrastructure (track, signalling, buildings,...) is to be established first.

Documentation for system planning is currently centralised at the Kazguiprozheldortrans Institute in Almaty. Visual inspection and preliminary topographical surveys will complete as required the basic data.

Technical repair, upgrading and required reconstruction work (on track, signalling, buildings,...) will be assessed for the various traffic volume hypothesis and according to the prevalent construction criteria (maximum axle load and train load, maximum speed, etc.). Track doubling on some sections could be considered, depending upon the perspective of the future traffic of the line.

General layouts and descriptions of the proposed repair works and construction of new fixed installations with their main characteristics will then be worked out.

3.3.3 Economic and Financial analysis

(a) Construction and equipment cost

On the basis of the descriptions of the proposed installations, specifications of special equipment, sketches of the special structures, etc., the major construction and equipment cost items have to be identified and quantity and cost estimates for works and supplies have to be prepared. These will take into account local and foreign costs, and will include

the necessary reserves for contingencies and price increases. These estimates have to be prepared in the schedule of expenditure form according to the execution schedule of each of the alternatives.

(b) Maintenance costs

Costs for maintenance and periodical replacements of fixed equipment will be calculated on a year by year basis for a suggested 20 year period.

(c) Estimates of benefits and disbenefits

In a brief study, the consultant will estimate the benefits and disbenefits of each of the alternatives considered. If possible and necessary, this study should include also indirect benefits and disbenefits of the project. The main purpose is to demonstrate the methods used in the West; it is expected that precise evaluations may not be possible.

(d) Economic and financial feasibility

The economic and financial feasibility of the different options will be assessed.

- Economic profitability of each alternative will be calculated from the point of view of the national community, taking into account both the operator, as the users and other economic agents.
- Financial profitability calculations will be made in a similar way but from the single viewpoint of the operator
- A sensitivity test will examine the effect of alterations to the basic assumptions, such as traffic levels and implementation costs, on the return of the proposed work

The calculation will be in accordance with the rules recommended by the International Union of Railways and the International Finance Organisations

3.3.4 Other selection criteria

The consultant will examine other factors that may impact upon the feasibility of implementing the proposals, such as:

- Government policy and regulations
- Supply of materials and equipment
- Possible contractors
- Local and foreign funding sources

Where, as of mid 1995, the railway system is virtually an integral part of state property, the restructuring and commercialisation of Kazakhstan railways may impact in the long run upon the management system, construction, operation, tariffs applied, etc. related to this project.

61.

3.3.5 Ranking of alternatives

The proposed solutions will be classified according to economic and financial criteria, and will include criteria not assessable in monetary terms.

From this classification, recommendations as to the solution to be implemented and its implementation schedule will be drawn up. Reports will be drawn up in bankable form.

This work being completed, the module will have reached a basic decision point, which should be reviewed by local authorities and TRACECA management.

3.3.6 Initial engineering design stage

During the remainder of the project, and depending upon the selected way forward, the consultant will work out with the local authorities the following tasks :

- Initial engineering design for the most favourable option
- Project plan
- Provide procurement / tendering advice
- Financing Strategy and Programme
- Proposal for the management of the upgrading programme

Final engineering design and preparation of tender documents are not included in the scope of work.

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**4. MODULE B :
Proposals and Training to improve the freight and passenger service on
Traceca and Europe-Asia route from operational and commercial point of
view**

4.1 Introduction

4.1.1 In the past, railway production schedules were drawn up on a centralised basis in Moscow. Today, the railway production schedules are drawn up on a decentralised basis. They have to be more flexible and be tailored to the needs of the customers, who will decide more freely upon the most appropriate transport mode for their requirements.

4.1.2 Railway schedules of the various organisations have to be co-ordinated and matched to ensure an attractive and efficient offer in an international perspective.

4.2 Objectives and Main outputs

Survey, training and recommendations to investigate and improve the overall rail traffic service quality on TRACECA and Europe - Asia main rail route

4.3 Scope of Work

The study focusses in particular upon operational and commercial improvements on the main Traceca route in all five railways East of the Caspian Sea study (Turkmenbashi - Dushanbe - Bishkek - Druzhba)

4.3.1 Survey of the existing situation

- Examine the existing freight train capacity, train schedules, overall transit times, tariffs and fares, and actual performance of the rail transport operations on the mentioned route. This task will require gathering of data from railway administrations regarding the theoretical and actual timetable. to be completed by witnessing and / or sample testing of transport on the route.
- Examine the current organisation how train schedules are determined and operated in the railways along the route. This will require contacts at railway headquarters level, but probably also in districts or lower departmental levels.
- Examine the current commercial organisation of the railways along the route
- Examine the tariff structure in international rail traffic
- Inventorise and evaluate the international cooperation from operational and commercial point of view
- Inventorise delays at the border stations on the route (railway technical causes and other), their causes, and formulate proposals how to decrease or overcome them

4.3.2 Study visit to two European railways

(a) The study visit participants will be drawn from the five railways concerned and will be selected by the Consultant in consultation with the TRACECA Management and National authorities.

(b) The purpose of the study visit is to show the participants the operations and commercial organisation of Western railways related to international traffic, and more in particular :

- the organisational and technical arrangements for deciding operational transport schedules (individual wagonload and block train schedules)
- the systems and tools used (manual and computerised) to assist the middle and senior management levels to draw up train schedules, rolling stock allocation and staff rostering decisions
- the systems and tools used to monitor execution of the train service, transport quality and performance indicators
- the practice of planning and deciding international freight and passenger schedules, taking into account commercial, technical and financial requirements; the distribution within and outside the organisation of these decisions to all interested participants
- the joint use of rolling stock and maintenance facilities between EU railways
- the commercial marketing and sales functions of EU railways
- the experience of working in the market in relation with customers and in competition with other transport modes
- the operational, technical and commercial cooperation between EU railways

(c) The study visit will cover two EU railways. The proposal will indicate the proposed study visit programme, which should last about 2 weeks for 8 participants.

4.3.3 Propose adjustments, on the five railways concerned, to improve the international movement of freight and passengers, the overall transport quality and transit times, etc. on the main Traceca route.

Adjustments could include :

- Changes and improvements implementable in the short-term e.g. regarding train schedules, harmonisation of the tariff structures, etc.
- Suggestions in a broader context e.g. infrastructure and rolling stock improvements, modernisation of telecommunications, improved cargo transportation services, setting up a computer network on the Traceca route, changes in the railway organisation, etc.
- Suggestions for adjustments external to the railway organisations e.g. legal protection of transported cargo, other areas which require co-ordinated government initiative.

Technical assistance will be aimed at :

- identifying the changes required in the railway organisation to tailor the transport product to the requirements of the market place
- technical changes recommended in the current method how to draw up train timetables, rolling stock and staff schedules.
- definition and evaluation commercial performance

5. MODULE C :

Feasibility study for a key bridge on Traceca route: Including the full inspection of an existing rail bridge, and review of an existing feasibility study for a new road-rail combined bridge over the Amudarya river (Chardzhev area) in Turkmenistan

5.1 Introduction

5.1.1. General

(a) Present crossings of the AmuDarya river at Chardzhev comprise a rail bridge and a pontoon crossing for road traffic, with a ferry in reserve. These crossings constitute vital transport links for local and international traffic.

The crossings are situated in a wide alluvial plain. The river flow is influenced by irrigation works upstream, but is still subject to flooding. There is some navigation.

(b) The rail bridge was built at the turn of the century (1898-1901) with materials brought in by ship and rail from Krasnovodsk. It comprises approximately 25x55metre spans of simply supported steel trusses with convex upper chords. The spans are supported on cylindrical steel piers. In addition to a rail track the trusses carry HT power pylons. The rail bridge is a masterpiece of railway engineering, and is at the same time a very strategic part of central Asia rail and transport network, as it is the only rail bridge across the Amudarya river.

There are currently no speed restrictions on the bridge. From a distance the bridge shows no signs of age, distress or any other inadequacy, but the bridge is reportedly suffering from age and structural wear. Especially the foundations are said to be too light for the current rail traffic, as they were originally built for 16 T axleload, which has increased over the years to 25 T. It is said that the bridge is worn out and will have to be closed in the not so far future.

(c) The pontoon crossing is located approximately 1 km west of the rail bridge. The crossing is precarious, particularly for heavy vehicles. It is shut down for several days each year due to floods. Approach roads are indirect and encumbered by urban traffic.

(d) In 1982, a feasibility study for a new combined bridge was prepared by the Moscow Bridge Institute Guiprotransmost.

Three site options have been considered. The preferred site is close to the existing rail bridge.

Three technical options are formulated in the abovementioned study : a continuous steel truss, simply supported prestressed concrete beams, and simply supported steel trusses. All options comprise 18x110 metre spans, supported by concrete piers on deep piles (+/- 42 metres). The road and rail bridges sit on the same pile caps, but are separate structures. The solutions proposed appear typical and practical FSU standard bridge designs. Reportedly the intention was to build the common foundations and the road bridge first, then the rail bridge at some later date.

Geotechnical profiles are shown in the existing feasibility study.

(e) The planning of a new bridge will currently be influenced by the following factors :

- Road : The requirement to improve the crossing for road vehicles at Chardzhev
- Rail :
 - The outcome of the investigation regarding the life span of the existing rail bridge at Chardzhev, and the recommendations regarding its replacement
 - The new rail line Chardzhev - Kerki, and the planned rail bridge at Kerki. A trade-off between rail investments required at Chardzhev and Kerki to ensure the rail crossing of Amudarya river must be considered.

5.1.2. Security Clearances

The feasibility study and the existing site are both subject to security restrictions dating back to Soviet days. As a condition for carrying out this study, the Recipient State will be asked to make available the full feasibility study and security clearances for access by engineers to the existing bridge. The Consultant may allow for a maximum of one man.month of time to obtain the report and clearances. If after two weeks prior notice of his arrival in Ashgabad, plus two weeks in Ashghabad, all reports and clearances necessary to complete the work have not been issued to him, then the project will be put in abeyance and eventually abandoned, with a commensurate reduction in the contract price.

5.2 Objectives

The objective is to produce a comprehensive feasibility study for the development of the Amudarya road and rail crossing at the Chardzhev site, with full justifications for technical and investment recommendations made.

Supporting objectives are to:

- Inspect and assess the useful remaining life of the present rail bridge, recommend maintenance and reinforcement measures if appropriate
- Review the existing Moscow Bridge Institute feasibility report for technical validity, including environmental impact, and developing variants if appropriate
- Carry out a full economic analysis of the crossing, including traffic surveys, projections, and toll potential
- Develop an implementation plan for presentation to International Financial Institutions (IFI).

Furthermore, know-how transfer to the Recipient State is a prime objective, and local counterparts should be fully involved in all aspects of the project.

5.3 Scope of Work

5.3.1. Traffic Forecasts

The Consultant will establish forecasts for future road and rail traffic. These will be based on validated records, traffic counts, and O/D surveys which are to be conducted by the Consultant, as well as Regional economic development scenarios based on or compatible with IFI projections. Scenarios for traffic development with a new fixed crossing and without are to be projected.

The Consultant must also estimate potential future toll revenues from an eventual road (and/or rail) bridge.

The Consultant is to explain in his tender his data collection, user survey, traffic and revenue forecasting methodology (see also Section 6.2)

5.3.2. Inspection of the Existing Rail Bridge

The Consultant will carry out a thorough inspection of the existing rail bridge. He will estimate the future useful life span of the bridge taking into account the expected intensity of traffic both in load and volume.

He will determine items, methods and costs to carry out urgent repairs, if any.

He will review actual maintenance practice, make recommendations on future systematic maintenance, as well as any exceptional requirements.

He will determine the technical and economic feasibility to extend the life of the existing bridge, given current and future traffic flows.

He will prepare an estimate of the cost of future maintenance requirements, for the full anticipated life of the rail bridge.

For the future rail flows, the effect of the new rail line Chardzhev - Kerki, and the possible future rail crossing at Kerki should be taken into account.

5.3.3. Review of Existing Feasibility Study - Other crossing Options

The existing feasibility study for a new combined bridge is to be reviewed, and if necessary added to, to include aspects such as:

- design standards
- traffic capacity
- geotechnical conditions
- hydrological conditions and navigation requirements
- cost of construction and maintenance costs
- construction techniques
- required mobilisation of resources both local and foreign
- land acquisition, compensation payments, social impacts
- environmental impacts using recognised guidelines

The approach routes to the fixed crossings by road and rail, are to be examined for bottlenecks and necessary minimum improvements required to match an improvement in the river crossing itself.

A simple and practical solution for a fixed crossing is to be recommended, taking into account the limited funds that will be available to carry out the work, and the enormous competing demands for transport infrastructure investment throughout the Region.

Other options than a new combined road-rail bridge could also be considered, depending upon the road traffic potential and the lifespan of the existing rail bridge : e.g. a shuttle train service for road vehicles.

5.3.4. Economic Analysis

The Consultant is to calculate Vehicle Operating Costs (VOC) and Train Operating Costs (TOC) for representative vehicle categories. Cost of passengers times is also to be estimated.

A comprehensive cost-benefit study will be performed for the various crossing development options retained. This will include NPV, IRR, and other conventional economic indicators. The various forecast traffic scenarios will all be considered, as well as the full costings of construction, maintenance and use.

The analysis will be performed with and without taking into account the cost of passengers time.

The sensitivity of the analysis will be fully explored.

A thirty year cost-benefit stream should be considered.

5.3.5 Recommendations for implementation

Alternative implementation plans depending on different strategies for ownership and development of a new bridge (or other type of crossing) are to be presented. This is to consider the various options for full public ownership, build operate transfer (BOT) or other formats. The most advantageous alternative for the Recipient State is to be identified.

A full financial development plan for the road and rail fixed crossings is to be made. Toll revenues at various toll levels are to be considered. Toll collection systems are to be recommended.

The optimal phasing of construction is to be recommended.

The further necessary steps for project implementation are to be described, including legal framework, tendering procedures, and site procurement.

5.3.6. Conceptual Design Documents

The final technical recommendation including drawings and specifications will be presented, in English and in Russian, in a format and in sufficient detail for tendering, for final design and construction. All available geotechnical, hydrological and other technical data will be collated in the technical recommendation, to allow tenderers for final design and construction to present alternative technical solutions. While the present Consultant is to verify all data for the credibility of the feasibility study, the eventual builders of the bridge are to be responsible for all aspects relating to geotechnical and structural stability.

6. Other Related Projects

6.1 Several related reports prepared by Western consultants precede this project.

They include:

Rail Management Restructuring Studies	Armenia, Turkmenistan, Azerbaijan	TACIS
Rail Sector Survey	Russia, Ukraine, Kazakstan & Bielorusia	EBRD
Roads & Road Transport Study	Russia, Ukraine, Kazakstan & Bielorusia	EBRD
Central Asia Outline Transport Strategy	Kazakstan, Kyrgyzstan, Turkmenistan, Uzbekistan	EBRD/TACIS
Caspian and Black sea Port Studies	Georgia, Azerbaijan, Turkmenistan, Kazakstan	EBRD/TACIS/OTHERS
ESCAP studies	Asia	UN

6.2 At the time of writing, the following projects, sharing certain domains of interest with this one, are expected to commence shortly:

Regional Traffic Forecasting Model and Review of Int'l Route Capacity	TRACECA
Forwarding - Multi-modal Transport Systems	TRACECA
Inland Terminals - Railways	TRACECA
Trade Facilitation, Customs Procedures, Freight Forwarding	TRACECA
Transport Legal Reform	TRACECA

Other related projects are or may be expected to commence within the timeframe of this present one.

6.3 The Consultants appointed to carry out this project are to coordinate their work closely with all other related activities within the TRACECA region. This particularly applies at the Inception Report stage, when preceding reports by others should be fully assimilated (TACIS will not provide copies of preceding reports for tender preparation). Duplication of effort is to be avoided.

In particular coordination and exchange of data with the Traffic Forecasting project is to be foreseen

The preceding listing of related projects must not be considered limitative.

7. Local Participation

7.1 National consultants should be deeply involved in all aspects of the project. All TRACECA countries have Institutions specialising in various aspects of transport planning and engineering. Regarding the bridge, it is however unlikely they find the necessary experience in Turkmenistan.

It is a firm requirement that Organisation and Methodologies include local experts and Institutions to:

- make full use of local experience, antecedent projects and data bases
- promote the emergence of a financially viable local consulting sector
- ensure the effective transfer of know-how to the Beneficiary states
- ensure the enduring effect of project output

7.2 Consultants should base their activities largely in the TRACECA region, carrying out the project in collaboration with a local technical organisation(s), and employing both senior and junior professional staff, from several TRACECA states.

The Consultants Methodology should fully explain his training and transfer of know-how programme within the project.

Consultants must make amply clear in their proposal the arrangements they have made to work with local entities.

8. Foreign Expertise

The Consultant is free to compose his expatriate team for this project as he sees fit, but the following domains of expertise should be clearly visible in his proposed staff list:

- infrastructure planning
- infrastructure construction and repair experts (track, bridges, signalling, telecom)
- rail operations
- rail transport planning and management
- rail freight marketing
- rolling stock management
- workshop management, engineering and equipment
- investment planning
- rail transport economics
- road transport economics

9. Logistics

The Consultant shall be responsible for arranging necessary living accommodation, transportation, telecommunications, equipment, surveys, investigations, document reproduction, printing, secretarial services, office space and all other input required for the purposes of the work.

10. Time Table and Reporting

10.1 The project is to be completed within a period of twelve months.

10.2 All reports are to be delivered in the numbers, languages and locations as follows:

	Bound		Loose-leaf		Diskette (Eng.+Rus)
	English	Russian	English	Russian	
TACIS Brussels	5	1	1	1	1
TRACECA CU (per state)	1	5	1	1	0

The word processing programme to be used will be agreed with TACIS.

10.3 Reporting is to be in accordance with standard TACIS Guidelines. These foresee:

Project inception report

An Inception Report shall be issued within 2 months of the start of the project. It shall summarise initial findings and propose any modifications to the methodology and work plan. In particular it will adapt the work plan to the needs of each individual TRACECA state taking into account the parallel activities of other Technical Assistance programmes, avoiding duplication of effort, and addressing unfilled needs.

It will also confirm or modify institutes/organisations/consulting bodies to be directly involved in the implementation.

It will firm up or alter, if required, the arrangements planned for the study visit part of the work.

Project progress report

This report will be submitted at the end of month 6. It will cover technical progress to date.

One month will be allowed for TACIS to consider the contents and to orient the further phase of this project.

Final Report

The Draft Final Report for Module C will be issued at the end of Month 8.

The Draft Final Report for the other Modules will be submitted at the end of month 12.

Any comments on the Draft Final Report will be issued by TACIS Brussels within six weeks of its receipt. The Final Report incorporating any modifications will be issued one month thereafter (2,5 months after issue of the Draft Final)

All Reports must include an Executive Summary.

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ANNEX 2

Work Programme and Tables

OVERALL PLAN OF OPERATIONS

Project title : Rail Maintenance Central Asia: Infrastructure		Project number : TNREG 9310				Country : Kazakhstan, Kyrgyzstan, Tadjikistan, Turkmenistan, Uzbekistan				Page : 1							
Planning period : March 1996 - March 1997		Prepared on : 28/06/1996										EC Consultant : DE-Consult in association with ARE and SYSTRA					
Project objectives : Provide feasibility studies for upgrading of the Aktau - Beineu line and for the development of the Amudarya road and rail crossing at the Chardzhev site; survey of existing conditions, recommendations for investigation and improvement of the overall service quality on TRACECA rail corridor; training for senior staff in this regard																	
No	MAIN ACTIVITIES	TIME FRAME												EQUIPMENT AND MATERIAL	OTHER (flights) ¹		
		1995				1996				1997						PERSONNEL	
		1	2	3	4	1	2	3	4	1	2	3	4	EC Consultant	Counterpart (approximately)		
1	Inception Phase													1.0 MM	1	PC for the Project office (from the budget see below)	2
2	Data collection by local experts		X			XX								-	20		
3	Technical and economic surveys by the expatriate experts					XXX								10.5 MM	10		153
4	Examination of problems found and development of proposal and technical solutions					XX				X				14.0 MM	5		
5	Staff training phase (Study tour)									XX				1.0 MM		Training costs ² (53,940 + 14,130 ECU)	
6	Completion of technical documentation and outline and discussion of improvement measures									XXX				10.0 MM	4	Budget for purchase of material (240,000 ECU)	6
7	Preparation of Final Report									XX				1.0 MM			1
		TOTAL												37.5 MM	40.0 MM		24

- 1 only flights of expatriate experts to Central Asia (without trainees)
- 2 training costs in total including flights, per diem, etc.
- 3 including 4th phase

Figure 1

Module A		Feasibility study for upgrading of Aktau - Beineu line			
Traffic Forecast	1100	DE-Consult	Initial engineering design	1500	SYSTRA/ARE/DE-Consult
Assessment of present transport volume and traffic flows	1110	DE-Consult	Further selection criteria and ranking	1400	DE-Consult
Development of economy and transport system	1120	DE-Consult	Examination of further selection criteria	1410	DE-Consult
Calculation of future traffic volume	1130	DE-Consult	Ranking of alternatives and recommendations	1420	DE-Consult
			Economic and financial feasibility	1300	DE-Consult /ARE
			Definition of construction and equipment costs	1310	ARE/DE-Consult
			Definition of maintenance costs	1320	DE-Consult /ARE
			Definition of revenues	1330	DE-Consult
			Economic profitability	1340	DE-Consult
			Financial profitability	1350	DE-Consult
			Technical feasibility	1200	ARE/DE-Consult
			Survey of existing situation	1210	ARE/DE-Consult
			Analysis of former development plans	1220	ARE/DE-Consult
			Identification of bottlenecks, definition of upgrading strategies	1230	ARE/DE-Consult
			Definition of volume of repair and reconstruction works	1240	ARE/DE-Consult
			Description of proposed works	1250	ARE/DE-Consult
			Initial design and project plan	1510	ARE/SYSTRA
			Support for procurement and tendering processes	1520	SYSTRA
			Financing strategy and programme	1530	SYSTRA
			Proposals and recommendations for the upgrading programme	1540	DE-Consult /SYSTRA

Kaz - Involvement of Kazgiprozheldortrans

Figure 2

Module B
Proposals and training to improve freight and passenger traffic on TRACECA route

Existing conditions in freight and passenger transport 2100 ARE/SYSTRADA/DE-Consult	Study visit to Europe 2200 DE-Consult /ARE	Recommendations to improve freight and passenger transport 2300 ARE/SYSTRADA/DE-Consult
Assessment of current operation methods; scheduling Kaz 2110 ARE	Development of study visit programme 2210 DE-Consult /ARE	Operation 2310 ARE
Examination of current commercial organisation Kaz 2120 SYSTRA	Preparation and performance of study visit 2220 DE-Consult /ARE	Commercial performance 2320 SYSTRA
Examination of current tariff structure Kaz 2130 DE-Consult		Railway organisation; legal protection; tariffs Kaz
Evaluation of international cooperation/traffic Kaz 2140 ARE/SYSTRA		2330 DE-Consult

Kaz - Involvement of Kazgiprozheldortrans and/or other local Institutes respectively

Figure 3

Module C		Feasibility study for Chardzhev bridge	
Traffic and revenue forecast	3100 DE-Consult	Review of existing feasibility study	3300 ARE/DE-Consult
Survey of road and rail traffic data	3110 DE-Consult	Review of technical aspects	3310 ARE
Forecast of demand	3120 DE-Consult	Review of economic aspects	3320 DE-Consult
Forecast of revenue	3130 DE-Consult	Inspection of existing bridge and possible refurbishment	3200 ARE
		Assessment of technical situation	3210 ARE
		Evaluation of repair works, maintenance procedures	3220 ARE
		Assessment of feasibility of life extending	3230 ARE
		Economic analysis and recommendations	3400 DE-Consult/SYSTRA/ARE
		Estimation of investment costs	3410 DE-Consult
		Definition of operating costs	3420 DE-Consult
		Cost-benefit-analysis	3430 DE-Consult
		Financing strategies, financial development plan	3440 SYSTRA
		Recommendations for implementation	3450 DE-Consult/ARE/SYSTRA
		Preparation of preliminary design documents	3500 ARE

Kaz - Involvement of Kazgiprozhozdortrans and/or Turkmenian Institutes respectively

Staffing of expatriate experts

Expert	Position in the Project	Name of Expert	Company	Module	Responsibility/Main Input	Advice
Team Leader	Team Leader and Management and Organisation Specialist	Norman Griffiths	DE-Consult	Project Management Module A Module B Module C	Overall Project Management WP 1420, WP 1540 WP 2330 WP 3450	WP 1410
PM	Project Manager	Frank Prescha	DE-Consult	Project Management	Overall Project Management	
Expert 1	Transport Economist and Planner	Dr. Jutta Völker	DE-Consult	Module A Module C	WS 1100, WP 1410 WS 3100, WP 3320	WP 1420
Expert 2a	Infrastructure Specialist (Track)	Michael Wogowitsch	ARE	Module A	WS 1200	WP 1310, WP 1320, WP 1510
Expert 2b	Infrastructure Specialist (Permanent Way, Stations, Structures)	Michael Kontur	ARE	Module A	WS 1200	WP 1310, WP 1320, WP 1510
Expert 3	Railway Signalling and Telecom Specialist	Peter Wegenstein	ARE	Module A	WS 1200	WP 1310, WP 1320, WP 1510
Expert 4	Cost and Tariff Specialist	Bernard Draper	DE-Consult	Module A Module B Module C	WS 1300 WP 2130 WP 3420, WP 3430	WP 2330 WP 3130, WP 3410
Expert 5	Specialist for Rolling Stock and Workshops	Hans-Joachim Freitag	DE-Consult	Module A	WS 1200	WP 1310, WP 1320
Expert 6	Investment Planner	Francois Cancalon	SYSTRA	Module A Module C	WP 1520, WP 1530 WP 3440	WP 1510, WP 1540 WP 3450
Expert 7	Rail Operations Specialist	Walter Hassmann	ARE	Module B	WP 2110, WP 2140, WP 2310	
Expert 8	Rail Marketing Specialist	Pierre Chartier	SYSTRA	Module B	WP 2120, WP 2140, WP 2320	
Expert 9	Infrastructure Specialist (Bridge)	Hans Krall	ARE	Module C	WS 3200, WP 3310, WP 3410, WS 3500	WP 3450
Expert 10	Infrastructure Planner	Günter Fleischmann	ARE	Module A Module C	WP 1510 WS 3500	WP 3310, WP 3410, WP 3440
Expert 11a	Study Visit Manager (Germany)	Dr. Erika Müller	DE-Consult	Module B	WS 2200	
Expert 11b	Study Visit Manager (Austria)	Richard Vegricht	ARE	Module B	WS 2200	

Use of expert's capability

Expert	Position in the Project	Total	Man-Month			Proportion of Time in Field ¹
			in Module A	in Module B	in Module C	
Team Leader	Team Leader and Management and Organisation Specialist	7	2	3	2	70
PM	Project Manager ²	0.5			0.5	> 50
Expert 1	Transport Economist and Planner	3.75	2		1.75	50
Expert 2a	Infrastructure Specialist (Track)	2.5	2.5			60
Expert 2b	Infrastructure Specialist (Permanent Way, Stations)	1	1			75
Expert 3	Railway Signalling and Telecom Specialist	1.5	1.5			65
Expert 4	Cost and Tariff Specialist	4	1	2	1	50
Expert 5	Specialist for Rolling Stock and Workshops	1	1			50
Expert 6	Investment Planner	2.75	1.5		1.25	45
Expert 7	Rail Operations Specialist	3		3		75
Expert 8	Rail Marketing Specialist	3		3		75
Expert 9	Infrastructure Specialist (Bridge)	3.5			3.5	45
Expert 10	Infrastructure Planner	2.5	1		1.5	30
Expert 11a	Study Visit Manager (Germany)	0.75		0.75		
Expert 11b	Study Visit Manager (Austria)	0.75		0.75		
Subtotal	without Team Leader and Project Manager	30	11.5	9.5	9	
Total		37.5	13.5	12.5	11.5	

¹ figures rounded off/up to five per cent

² without effort for backstopping planned according to the Technical Proposal

Staff Assignment Schedule

	Month 1 March	Month 2 April	Month 3 May	Month 4 June	Month 5 July	Month 6 August	Month 7 September	Month 8 October	Month 9 November	Month 10 December	Month 11 January	Month 12 February	Month 12 March	after month 12
Project Title: Rail Maintenance Central Asia: Infrastructure														
Project Number: TNREG 9310														
Country: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan														
Planning Period: March 1996 - March 1997														
Prepared on: 28/06/1996														
EC-Consultant: DE-Consult in association with ARE and SYSTRA														
Project objectives : Provide feasibility studies for upgrading of the Aktau - Bejneu line and for the development of the Amuarya road and rail crossing at the Chardzhev site; survey of existing conditions, recommendations for investigation and improvement of the overall service quality on TRACECA rail corridor; training for senior staff in this regard														
Expert														
Team Leader	■													
Project Manager	■													
Expert 1	■													
Expert 2a	■													
Expert 2b	■													
Expert 3	■													
Expert 4	■													
Expert 5	■													
Expert 6	■													
Expert 7	■													
Expert 8	■													
Expert 9	■													
Expert 10	■													
Expert 11	■													
Expert 12	■													
Local Experts	■													

DF Report

PP Report

- Work in field
- Home office work
- Effort of local experts

Remark: The home office work can be stretched for a longer duration (with the same total capability)

ANNEX 3

CV's of Experts

CURRICULUM VITAE

Proposed position in the programme: Infrastructure bridge expert
On site investigation of bridge substructure
and superstructure

1. Family name: **KRALL**

2. First names: Hans

3. Date of birth: April 23, 1947

4. Nationality: Austrian

5. Civil status: married

6. Education:

Institution: Elementary school
Date: 1954 - 1958

Institution: Secondary school
Date: 1958 - 1962

Institution: Theoretical and practical training outside
Waagner-Biró during apprenticeship
Date: 1962 - 1965

*Degree(s) or Diploma(s)
obtained:*

7. Language skills:

<i>Language</i>	<i>Reading</i>	<i>Speaking</i>	<i>Writing</i>
German	5	5	5
English	3	3	3

8. Membership of professional bodies: --

9. Other skills: --

10. Present position: Chief erection supervisor; Consultant to ARE

11. Years within the firm: 26

12. Key qualifications: Expert in erection of road and railway bridge structural steelwork and mechanical equipment in Europe and Overseas Countries.
Skilled in bridge revisions and repair

13. Specific Eastern Countries experience:

Country:

Date:

14. Professional Experience Record:

Special experience with great bridges, selected out of a number of various structures

Date: 1994 - up to now

Location: Vienna

Company: PSM - Planning of steel and machinery construction Ltd

Position: Chief erection supervisor

Description: Expertise in the review of steel bridges and their rehabilitation and in the design of new bridges (road, railways)

Date: 15.4.1996 up to now

Location: Austria

Company: Waagner-Biró AG

Position: Chief erection supervisor

Description: Praterbrücke across the Danube / Vienna;
Lifting, strengthening and revision of the 320 m /5,000 tons road bridge up to 1.8 m

Date: 1994 - 1995

Location: Austria

Company: Waagner-Biró AG

Position: Chief erection supervisor

Description: Ostbahn Brücke / Vienna
Railroad bridge, 80 m spans
Lifting of the total 320 m bridge for 4.3 m
Lifting and revision of the riveted bridge

Date: 1992 - 1993

Location: Dubai /UAE

Company: Waagner-Biró AG

Position: Chief erection supervisor

Description: Al Maktoum Bridge
Bascule road bridge, erection, yearly revision and maintenance (together with Cleveland bridge in Dubai)

Date: 1988 - 1989
Location: Iran
Company: Waagner-Biró AG
Position: Chief erection supervisor
Description: Bafq Bandar Abbas Bridge / Iran
Railway bridge, erection

Date: 1985 - 1986
Location: Iraq
Company: Waagner-Biró AG
Position: Chief erection supervisor
Description: Rumallah Bridge, swing bridge, road bridge,
erection

Date: 1981 - 1983
Location: Iraq
Company: Waagner-Biró AG
Position: Chief erection supervisor
Description: Garamt All Bridge, swing bridge, road bridge,
erection

Date: 1978
Location: Austria
Company: Waagner-Biró AG
Position: Chief erection supervisor
Description: Floridsdorfer Brücke over the Danube / Vienna
300 m double box girder bridge, road bridge,
erection

Date: 1972 - 1976
Location: Germany
Company: Waagner-Biró AG
Position: Chief erection supervisor
Description: König Karls Brücke / Stuttgart
Multiple box girder road bridge, erection

Date: 1965 - 1966
Location: India
Company: Waagner-Biró AG
Position: Erection supervisor
Description: Kidderpore Bridge / Calcutta
Double swing road bridge, erection
Road bridge box girder, erection

15. Others:

CURRICULUM VITAE

Proposed position in the programme: Project Manager

1. **Family name:** PRESCHA
2. **First names:** Frank
3. **Date of birth:** May 24, 1960
4. **Nationality:** German
5. **Civil status:** married
6. **Education:**

Institution	Moscow Railway Engineering Institute
Date:	1978 - 1983
Degree(s) or Diploma(s) obtained:	Graduate engineer-economist (Diploma in the field of economy and organization of railway transport)

7. **Language skills:** (Mark 1 to 5 for competence)

Language	Reading	Speaking	Writing
German	mother tongue	mother tongue	mother tongue
English	4	3	3
Russian	5	5	5

8. **Membership of professional bodies:** no
9. **Other skills:** Computer knowledge
10. **Present position:** Project Manager in the Regional Department Europe with Deutsche Eisenbahn-Consulting GmbH
11. **Years within the firm:** 5 years
12. **Key qualifications:**
 - theoretical and practical knowledge in the analysis of transport systems and the development of solutions as part of a number of research projects
 - participation in analyses, feasibility studies and technological innovations in the fields of goods transport technologies, logistics, preplanning of goods transport facilities and information and communication technologies
 - participation in the investigation of goods traffic centres and terminals for the combined transport for the German Master Plan of Transportation Routes, especially needs and site analyses for facilities of combined transport

13. Specific Eastern Countries experience:

Country	Date: from (year) to (year)
CIS	1992
Lithuania	1992
Belarus	1995
Poland	1995

14. Professional Experience Record:

Date:	1995
Location	Belarus
Company	DE-Consult
Position	Expert for Operation, Rolling Stock and Infrastructure
Description	EU/TACIS-funded project „Technical Assistance to Belarussian Railways Analysis of te infrastructure and refurbishing options, analysis of traction and rolling stock and identification of refurbishing options, analysis of current operational procedures and performance

Date:	1994 - 1995
Location	Germany
Company	DE-Consult, ordered by the HOECHST AG, Frankfurt/Main
Position	Project Manager
Description	Analysis of potentials for rationalization in an industrial railway, identification of possibilities to increase effectiveness with outsourcing and introduction of services for third parties; analysis of operational and economic results; determination of needed human resources and rostering for shunting staff; assessment of costs and prices for shunting works

Date:	1993 - 1994
Location	Germany
Company	DE-Consult/TRANSPORTCONSULT
Position	Project Engineer
Description	Investigation on goods traffic which is agreeable for the city and the region of Chemnitz; investigation and assessment of suitable goods, traffic locations for combined transport, technological investigations with regard to railway operation

Date:	1993 - 1994
Location	Germany
Company	TRANSPORTCONSULT
Position	Project Engineer
Description	Investigation of the shift of the responsibility for short-distance passenger railway traffic to regional authorities in the region Upper Lusatia/Lower Silesia; assessment of existing railway infrastructure with regard to its further usability for regional traffic offers, analysis of existing traffic offers, elaboration of new service offers

Date:	1993
Location	Germany
Company	TRANSPORTCONSULT
Position	Project Engineer
Description	Investigation in the field of "Railway Logistics in Berlin", analysis, assessment and calculation of railway infrastructure and goods traffic installations in the area of Berlin, investigation of the utilization of the capacity with regard to railway operation, analysis of the infrastructure need concerning lines, junction stations and goods traffic installations

Date:	1992 - 1993
Location	Germany
Company	TRANSPORTCONSULT
Position	Project Engineer
Description	Technological conceptions in the field of goods traffic for better utilization of transport capacity; analysis of the level of use of rolling stock at the German Railways, analysis of the level of use of railway transport facilities (stations, goods traffic plants, private siding tracks etc.), assessment of the possibility of reutilization of abandoned railway transport facilities in urban areas

Date:	1992
Location	Lithuania
Company	TRANSPORTCONSULT
Position	Project Engineer
Description	Factfinding mission at the Lithuanian Railways, analysis of the level of development in all important sectors of the National Lithuanian Railways, identification of bottlenecks and deficiencies in the railway system, definition of practicable measures supporting the stabilization of railway transport in Lithuania

Date:	1992
Location	Germany
Company	TRANSPORTCONSULT
Position	Project Engineer
Description	Optimization of the organizational structures for container traffic with the CIS-states, analysis of the level of development of combined transport, analysis of interfaces and recommendations for technological, technical and organizational as well as commercial measures

Date:	1992
Location	Germany
Company	TRANSPORTCONSULT
Position	Project Engineer
Description	Analysis of the location for goods traffic centres with integrated terminals of combined transport in the area of Magdeburg

Date:	1991 - 1992
Location	Germany
Company	TRANSPORTCONSULT
Position	Project Engineer
Description	Logistical service centre Berlin, investigation of innovative multimodal goods traffic technologies, investigation of information and communication technologies within complex goods traffic facilities as well as between subcentres

Date:	1991
Location	Germany
Company	TRANSPORTCONSULT
Position	Project Engineer
Description	Analysis of the location for goods traffic centres with integrated terminals of combined transport in the area of Erfurt, Zwickau and Gera, Germany

Date:	1991
Location	Germany
Company	TRANSPORTCONSULT
Position	Project Engineer
Description	Goods traffic centres in the economic region of Thuringia and West Saxony, Germany, from the railway's point of view, analysis of the economic and traffic development, needs and site analyses for goods transport facilities

Date:	1988 - 1990
Location	Germany
Company	Ministry of Transport
Position	Staff member in the Department for Science and Technology as well as Investments resp. in the Department for Transport Policies

Date:	1983 - 1988
Location	Germany
Company	Central Research Institute of Transportation
Position	Staff Member
Description	Staff member for economic investigations in the field of transportation at the Institute for Complex Scientific Transport Problems, expert for economic investigations in the field of transport at the Centre for Transport Economy, several projects on the analysis of systems and development of technologies in goods traffic as well as for the rationalization of transport/logistics for industrial enterprises, feasibility analysis of using inland waterways and railway container transport by industrial enterprises, technological analysis and investigation in the field of freight motor traffic

15. Others: none

ANNEX 4

Specification of the services of the local counterparts in the Project

Specification of the work allocation to the local experts

In accordance with the Technical Proposal it was planned that the local partner, the Kazgiprozheldortrans Institute of Almaty in Kazakhstan will provide a minimum of 40 man-month to this project.

The local experts will work under the lead of the expatriate experts. The basis of the work of the Kazgiprozheldortrans experts will be detailed questionnaires and working programmes prepared by the responsible expatriate experts. These questionnaires and programmes will be checked by the team leader of the consortium and the project manager of Kazgiprozheldortrans.

The main tasks of the local experts are located in Phases 2-4 of the project. In the later phases they will be partly involved as partners during discussions about the proposed improvement measures and recommendations in all Modules.

It is planned to include further short term local experts of the other recipient countries in the framework of the budget of Kazgiprozheldortrans by shifting within the budget framework.

Kazgiprozheldortrans (and the other local partners) will be involved in the following work packages and will perform the work as described as follows:

1.1. Module A : Feasibility Study for Upgrading of Aktau - Bejneu - Section

- WP 1110 Assessment of present transport volume and traffic flows
 - data collection about freight and passenger traffic volume on the section
 - analysis of train schedules
 - organisation, provision and analysis of a limited passenger count/interview on the line
- WP 1120 Development of the economy and the regional transport system
 - data collection about economy, transport and socio-demographic developments in the catchment area of the line section and in Kazakhstan in general
- WS 1200 Technical feasibility (WP 1200 - 1240)
 - data collection about the present technical condition of the line (track, structures, signalling, telecommunication, rolling stock used, maintenance situation)
 - provision of maps and existing projects concerning the line section
 - data collection and analysis concerning existing railway construction standards relevant to the reconstruction of the line
 - data collection concerning existing railway construction capacity and equipment
 - participation in the surveys done by the expatriate experts
 - analysis of former development plans concerning the investigated line
 - participation in the identification of bottlenecks and the definition of volume of repair and modernisation works
- WP 1310 and 1320 Construction, equipment and maintenance costs
 - assessment of local cost levels for construction measures, equipment and maintenance procedures in Kazakhstan

1.2. Module B : Proposals and Training to improve Freight and Passenger traffic on TRACECA route

- WP 2110 Assessment of current operation methods
 - data collection and data analysis concerning operation methods, train and marshalling procedures, operation control and time table planning in the beneficiary railways of the Central Asian states (Kazakhstan, Turkmenistan, Uzbekistan, Tadjikistan and Kyrgyzstan)

- assistance during the visit of the expatriate expert
- WP 2120 Examination of current commercial organisation
 - data collection and data analysis concerning commercial organisation and commercial procedures in freight and passenger traffic in the beneficiary railways of the Central Asian states (Kazakhstan, Turkmenistan, Uzbekistan, Tadjikistan and Kyrgyzstan)
 - assistance during the visit of the expatriate expert
- WP 2130 Current tariff structure
 - data collection and data analysis concerning freight and passenger traffic tariff systems in the beneficiary railways of the Central Asian states (Kazakhstan, Turkmenistan, Uzbekistan, Tadjikistan and Kyrgyzstan)
 - assistance during the visit of the expatriate expert
- WP 2140 International co-operation and traffic exchange
 - data collection and data analysis concerning operation procedures on border stations, rolling stock exchange and commercial formalities between the beneficiary railways of the Central Asian states (Kazakhstan, Turkmenistan, Uzbekistan, Tadjikistan and Kyrgyzstan)
 - assistance during the visit of the expatriate expert
- WP 2330 Railway organisation and legal procedures
 - data collection and data analysis concerning railway organisational structures, the legal framework of the beneficiary railways of the Central Asian states (Kazakhstan, Turkmenistan, Uzbekistan, Tadjikistan and Kyrgyzstan)
 - assistance during the visit of the expatriate expert

1.3. Module C : Feasibility Study for Chardzhev Bridge

- WP 3110 Survey of road traffic and railway traffic data
 - data collection about freight and passenger traffic crossing the bridge
 - data collection of economic and socio-economic data of the Chardzhev Region
 - analysis of train schedules and railway statistics
 - data collection regarding existing road traffic crossing the pontoon bridge (type of vehicle, origin/destination etc.)
 - organisation, provision and analysis of a limited count/interview on the existing bridge and on the road pontoon bridge (duration of the counts max. 4 days)
- WS 3200 Inspection of the existing bridge
 - data collection concerning the state of the existing bridge
 - participation in the inspection of the existing bridge together with the expatriate expert
 - evaluation of current maintenance procedures for railway bridges
 - participation in the evaluation of repair work needed
- WS 3300 Review of existing study
 - analysis of the existing bridge study for technical and economic aspects
- WP 3410 and 3420 Investment and operating costs
 - assessment of local cost levels for construction measures, equipment as well as maintenance and operation procedures
 - assessment of rail operation costs

Rostering of the Local Experts¹

Name	Position in the Project	Modules Involved	Main Responsibility	Man- Month in			Total
				Module A	Module B	Module C	
Mr. Aldobayev	Bridge Expert	C	Review of existing bridge study from technical point of view (C); Assessment of present technical condition of the bridge (C) Evaluation of volume of repair work needed (C); Evaluation of current maintenance procedures (C); Estimation of local investment costs for the Amudarya bridge (C)	-	-	6	6
Mr. Berman	Rail Operations Expert	A, B and C	Survey of existing situation in rolling stock and maintenance (A); Definition of local construction, equipment and maintenance costs (A); Assessment of current operation methods and scheduling in passenger and freight traffic (B); Assessment of present state of the international railway co-operation from operational point of view (B); Input in the estimation of operating costs for the cost-benefit-analysis for the Amudarya bridge (C)	1.5	4	1	6.5
Mr. Jagmurov	Signalling and Telecommunication Expert	A	Survey of existing situation of the signalling and telecommunications installations on the Aktau - Bejneu section (A); Analysis of former development plans (A); Identification of bottlenecks in signalling and telecommunications installations (A); Definition of local construction, equipment and maintenance costs (A)	2	-	-	2
Mr. Novitzki	Track Expert	A	Survey of existing situation of the track on the Aktau-Bejneu section (A); Analysis of former development plans (A); Identification of bottlenecks in track situation (A); Definition of local construction, equipment and maintenance costs (A)	3.5	-	-	3.5

¹ Parts of the time budget of the experts will be shifted to local experts of the other recipient countries. It concerns the experts involved in Module B and C

Mrs. Smirnova	Economist and Marketing Expert	A, B and C	<p>Survey of present transport volume and traffic flows (A);</p> <p>Analysis of development of the regional economy and the regional transport system (A);</p> <p>Organisation of limited counts/interviews, if necessary and possible (A and C);</p> <p>Examination of current commercial organisation (B);</p> <p>Assessment of present state of the international railway co-operation from organisational and commercial point of view (B);</p> <p>Assessment of organisational structures and the legal framework of the railways (B);</p> <p>Survey of road and rail traffic data for the Amudarya bridge (C);</p> <p>Review of economic aspects of the existing bridge study (C)</p>	3.5	4	3	10
Mr. Taranenko	Track Expert	A	<p>Survey of existing situation of the track on the Aktau-Bejneu section (A);</p> <p>Analysis of former development plans (A);</p> <p>Identification of bottlenecks in track situation (A);</p> <p>Definition of local construction, equipment and maintenance costs (A)</p>	3.5	-	-	3.5
Mrs. Vinzyuk	Costs and Tariff Expert	A, B and C	<p>Definition of local construction, equipment and maintenance costs (A);</p> <p>Estimate of revenues and commercial tariff level on the line (A);</p> <p>Assessment of current tariff structure in passenger and freight traffic (B);</p> <p>Estimation of local investment costs for the Amudarya bridge (C);</p> <p>Input in the estimation of operating costs for the cost-benefit-analysis for the Amudarya bridge (C)</p>	2	4	2	8

The Project and Design Institute "Turkmenzheldorproyekt"

The Project and Design Institute "Turkmenzheldorproyekt" (Turkmen Railway Project) was founded on the 12th of December, 1991 by decree N° 3 of the Turkmenian Railways based on the former subsidiary of the Tashkent Institute "Tashzheldorproyekt". The Institute has been a structural unit of the state-owned Turkmenian Railways up to now.

The Institute "Turkmenzheldorproyekt" is the only specialised organisation for planning and design, which main activities are concentrated on planning and design of objects for railway transport and different railway installations as well as communication and signalling equipment for railway needs.

Besides this the Institute has the licence for planning and design of objects of civil engineering (house building, structural engineering, supply and dispose systems).

Since the day of its foundation the Institute has been planning and designing a big number of serious objects both for the Turkmenian Railways and for the other ministries and organisations. The institute was responsible for the planning of the passenger buildings, the stations and other buildings and installations for the construction of the new railway line Tedzhen - Serakhs, connecting Turkmenistan with Iran. There has been worked out the technical project for the construction of the new locomotive depot at the station Amudarya.

Together with the Russian company "Progress" the technical project for the construction of a plant for concrete sleepers in Ashgabat has been realised.

Furthermore the private sidings for the soda factory in Govurdak as well as the kaolin enrich plant in Dzhulga were planned.

Carrying out the decrees of the President of Turkmenistan the Institute is preparing the planning and design documents for private sidings of large grain mill and silo complexes in five districts of Turkmenistan at present.

In 1996 the planned volume of planning and design works of the Institute amounts to 150 Million Manat.

At present the Institute is working on the planning and design for the construction of the new railway line Chardzhev - Kerki - Kerkitchi with a length of 245 km including all installations and equipment.

The State-owned Scientific and Production Company "Turkmentransmost"

The Turkmenian State-owned Scientific and Production Company for planning and construction of bridges "GNPF Turkmentransmost", which belongs to the state-owned Railways of Turkmenistan was founded in 1993. It consists of the Bridge Construction Yard N° 1 (based in Ashgabat), the Bridge Construction Yard N° 2 (based in Chardzhev) as well as a Project and Planning Group.

The Bridge Construction Yards N°1 and N°2 were established based on departments of the former Bridge Construction Yard N° 85 being a part of the bridge construction trust N° 7 located in Tashkent and belonged to the former Soviet Ministry of Construction for Transport Needs.

The present Bridge Construction Yards and their predecessors have built many railway and road bridges in Turkmenistan: bridges crossing the Karakum channel, the Tedzhen and Murgab rivers, bridges on the Kzyl-Arvat - Gazandzhik line as well as bridges and road overpass bridges in the cities of Ashgabat, Chardzhev and Mary. A 680 m road overpass bridge in Chardzhev as well as bridges in Geotepe and Tedzhen have been built since 1993.

On the railway line Mary (Tedzhen) - Serakhs, opened for operation in May, 1996, subdivisions of Turkmentransmost built eight bridges, including two large bridges, and 33 pipe culverts.

The teams of the Bridge Construction Yards N°1 and N°2 have experience in the construction of bridge pillars on the Amudarya river. Considering the special equipment necessary, the Bridge Construction Yards N°1 and N°2 would be able to undertake the construction of the new bridge over the Amudarya river.

The financial state of the company shows it to be in profit.

ANNEX 5

Selected material concerning Module A
of the Project

Background Information to Module A

Technical and Operational Characteristics of the Aktau - Bejneu line

Length of the line:	403 km from Bejneu to Mangyshlak station 16 km from Mangyshlak station to Aktau Port (private non-public line)
Put in operation:	1968
Category of the line:	third (one of the lowest categories according to the FSU railway line classification)
Number of tracks:	one
Traction service:	by diesel locomotives only
Type of locomotive:	mainly 2 TE-3 (double section locomotive)
Maximum train weight:	3200 t to Aktau (so called even direction) to Bejneu: (so called odd direction) 2200 t on the Mangyshlak - Say-Utes section 3000 t on the Say-Utes - Bejneu section
Number of open line passing points:	15
Number of intermediate stations:	3 (Ustyurt, Shetpe, Say-Utes)
Width of the subgrade:	5.8 m
Usable length of passing tracks:	850 m
Length of track on embankments:	368 km
Length of track in cutting:	34 km
Maximal height of embankment:	20 m
Maximal depth of cutting:	14 m
Ruling gradient:	7 ‰ to Aktau to Bejneu: 7 ‰ on Mangyshlak - Shetpe and Say-Utes - Bejneu sections 15 ‰ on Shetpe - Say-Utes section
Number of trains:	
passenger trains	2 couples of trains per day between Mangyshlak and Aktau Port no passenger traffic
freight trains	2 couples of trains per day of them 1 block train and 1 pick-up freight train servicing all stations on the line

Locomotive and wagon service on the line

The section Bejneu - Say-Utes is operated by diesel locomotives 2 TE-3 and 2 TE-10L (both former soviet double section locomotives) and locomotive crews of the main locomotive depot at Bejneu station.

The section Say-Utes - Aktau is operated only by diesel locomotives 2 TE-3. The locomotive crews are from the main locomotive depot at Aktau station.

The main depot Bejneu consist of a locomotive servicing shed (for routine service programme "TO-2") as well as a locomotive servicing installation (former Soviet type "Orsk"; 48 x 24 m) with 3 tracks, both built in 1984. Besides there are different work shops, office and service buildings.

The main depot Aktau comprises:

- locomotive servicing buildings for routine service and maintenance programmes "TO-3" and "TR-1"
- locomotive shed for routine service programme "TO-2"
- locomotive servicing installations and installations for checking of rheostatic brakes
- lounges for locomotive crews, storehouse and garages

Lodges for locomotive crews are also existing at the Say-Utes station as well as at the Uzen station (terminal station of the branch line Aktau/Mangyshlak - Uzen)

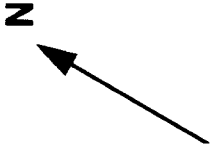
Wagon maintenance and repair points are located at the Say-Utes, Shetpe and Uzen stations. At Aktau station there is a wagon depot with points of preparation for loading of covered and refrigerator wagons as well as wagon transfer points for wagon inspection of wagons exchanged with private sidings.

Passenger Traffic Volume on Aktau - Bejneu Line

Station	Traffic Volume (Departure in 1000 Passengers)							
	Total				among them Local Traffic			
	1989	1992	1993	1994	1989	1992	1993	1994
Mangyshlak (near Aktau)	186.6	324.2	239.0	124.9	159.9	289.7	209.9	113.4
Passing Point N° 15	-	0.5	1.7	0.7	-	0.6	1.7	0.7
Shetpe	56.7	47.7	36.9	21.2	56.0	47.5	36.7	21.1
Passing Point N° 12 G	0.7	3.1	2.0	0.8	0.7	3.1	2.0	0.8
Passing Point N° 10 G	0.2	14.4	1.4	1.1	0.2	14.4	1.4	1.1
Passing Point N° 8 G	-	-	0.4	0.4	-	-	0.4	0.4
Say-Utes	16.6	92.3	30.6	6.4	16.5	92.3	30.6	6.4
Passing Point N° 6 G	-	-	0.2	0.7	-	-	0.2	0.7
Ustyurt	2.6	40.0	19.2	4.8	2.6	40.0	19.2	4.8
Bejneu	95.9	91.9	88.4	80.2	71.8	73.7	79.0	74.6
Total	359.3	614.1	419.8	241.2	307.7	561.3	381.1	224.0

Number of Passenger Trains on Aktau - Bejneu Line

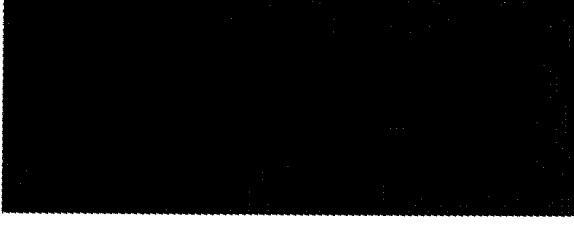
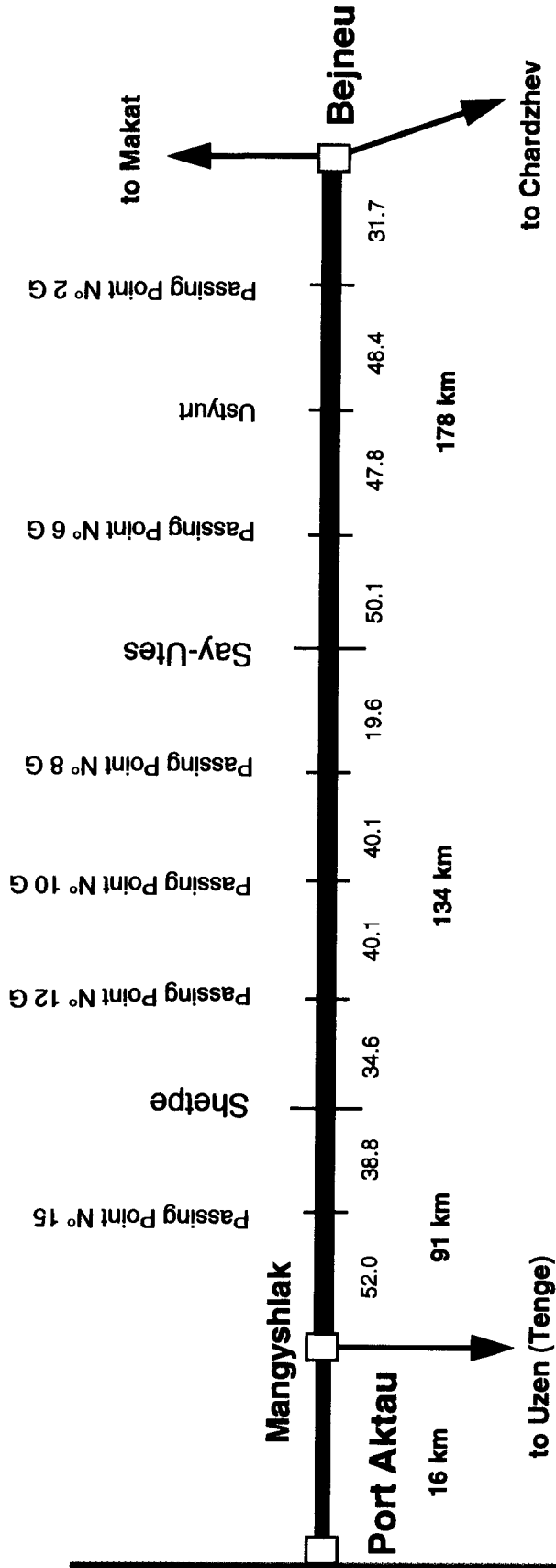
Train Relation	Traffic Days	Number of Coaches
Mangyshlak (near Aktau) - Bejneu - Makat - Atyrau (and return)	once a day, every day	22
Mangyshlak (near Aktau) - Bejneu - Kulsary (and return)	once a day, every day	5
Mangyshlak (near Aktau) - Uzen (and return)	once a day, every day	5



The Aktau - Bejneu line

schematized diagram

Western Kazakhstan Railways



ANNEX 6

Selected material concerning Module C
of the Project

Background Information to Module C

Chardzhev is the second largest city in Turkmenistan (183.000 inhabitants). From the administrative point of view it extends into the Lebap Velayat (District).

City / County	Inhabitants (1,000)
city of Govordak	31.2
city of Chardzhev	182.9
city of Kerki	29.8
city of Seydi	17.2
Dyanev county	45.3
Boynyuzin county	41.2
Darganatyn county	43.6
Chardzhev county	97.9
Farap county	46.8
Sakar county	32.3
Sayat county	48.5
Garabekeyvul county	38.4
Khodzhabaz county	48.0
Saparmyrat Niyazov county	49.4
Charshangin county	42.3
Kerki county	60.1
Khalach county	75.7
Total	930.6

Source: Statistical Yearbook of Turkmenistan 1994, Ashgabat 1996
(Народное хозяйство Туркменистана в 1994 г., Госкомстат Туркменистана, Ашгабат 1996)

It is an important industrial centre in Turkmenistan with chemical industry, textile industry (cotton treatment, knitwear, clothing, silk, cotton wool production), food industry.

Production of selected products in the Lebap Velayat (District):

Kind of Production	Volume 1990		Volume 1994	
	Total	Proportion, %	Total	Proportion %
Electric energy, Million KWh	13	0.1	341	3.2
Mineral fertilizer, 1,000 t	158	89.8	17	19.8
Timber, 1,000 m ³	5.3	9.5	0.1	4.5
Concrete products, 1,000 m ³	195.4	15.7	136.7	20.4
Bricks, Million units	157.9	24.2	112.8	30.7
Food stuffs, Million Manat			492.1	20.0
Products of light industries in total			505.4	29.2
Clothes (all classes), Million m ²	24.1	45.1	13.3	40.2
Grain crop, 1,000 t	88.3	19.7	166.6	15.1
Raw cotton, 1,000 t	374	25.7	295	23.0

Source: Statistical Yearbook of Turkmenistan 1994, Ashgabat 1996
(Народное хозяйство Туркменистана в 1994 г., Госкомстат Туркменистана, Ашгабат 1996)

A project exists for the construction of a bypass road around the city of Chardzhev; which should be implemented after 1997 (but the financing is not yet guaranteed).

At present there are no restrictions existing for train weight or speed on the railway bridge, but the speed is low because of the gradient of the track running up to the bridge and the station entry directly behind the bridge. The links to the bridge are only single track lines. In the opinion of the railways and other state authorities there is no necessity to plan a double track railway bridge (as considered in the past), because the previous traffic volumes will not be achieved again.

A high voltage cable line also uses the railway bridge to cross the river; the pylons being fixed directly on the bridge (a memorandum of the former railway direction in Tashkent says that this is the reason for additional problems with the bridge).

In the last few years some inspections of the existing railway bridge have been made by specialised bridge inspection organisations (among them, experts of the Moscow Railway Institute 1991). The results of these inspections are available at Turkmentransmost, now bound as a local partner to the Consultant.

Following these inspections, it had been estimated that the theoretical, reliable, life of the bridge would be reached in about 3 years time; that is in 1999. The calculations were based on earlier existing traffic levels of 20,000 train pairs per year (50 - 60 trains per day). In recent years, however, the traffic has decreased very considerably; to 15 - 20 train pairs per day. This means that the theoretical life of the bridge could be extended to 10 or 12 years from now; to 2006 - 2008.

The problems known and examined in the past comprised:

- state of the steel work
- stability of the bridge piers N° 19 and 24 (deep underwashing with dumping of stones to fight against this)

The pontoon bridge is the property of the Turkmenian Shipping Company (former Central Asia Shipping Company). The pontoon bridge is operating only by day (no traffic by night).

The actual number of vehicles crossing the bridge amounts to¹:

Period	Number of motor vehicles					
	Lorries		Motor cars		Coaches	
	Number	Proportion (%)	Number	Share (%)	Number	Proportion (%)
January - May 1996	36,260	95.9	1,440	3.8	120	0.3
May 1996	8,000	94.1	450	5.3	48	0.6
average per month	7,252		289		24	
average per day	239		9		< 1	

Source: Figures given by the Board of Ministers, Transport Dept.

¹ The accuracy of these figures was doubted by some local authorities, whereas the Board of Ministers is of the opinion, that the figures are more or less realistic. (It is possible that in fact the figures might be a little higher, especially concerning the motor cars)

The pontoon bridge is a toll bridge! Different rates are charged for foreigners and residents. The rate for residents was given with 50 Manat per motor car, 100 Manat per tonne for lorries (that is: 0.02 DM or 0.04 DM respectively?!). The Uzbekian forwarders met gave figures of 60 USD per lorry for foreign transport companies.

At present there is no public mass transit crossing the pontoon bridge.

Passenger traffic between the cities of Chardzhev and Farap (on the other side) is carried only by railways (6 train pairs per day). The long haul traffic crossing the bridge amounts to at most 4 pairs of passenger trains per day.

With the opening of the Sarakhs - Meshed line it is planned to offer new long haul passenger services Teheran - Tashkent, Teheran - Almaty, Teheran - Moscow in the medium and longer term.

The existing Feasibility Study of 1982 investigated 3 different options for the location of the future river crossing:

- Option 1: 13 km upstream of the existing bridge (this needs an additional bridge over the Amu-Bukhara Channel)
- Option 2: 250 - 300 m downstream of the existing bridge
- Option 3: 8 km upstream of the existing bridge.

For each of these options different technical solutions were investigated:

- separate railway and road bridges,
- combined bridge.

For railway bridges a steel bridge either with 66 m or 132 m spans were considered each supported by concrete piers with piers for either one or two railway tracks. For the road bridge different solutions were assessed with spans between 66 and 300 m. The solutions for a combined bridge were based on the options for the railway bridge with subvariants of a double deck bridge or parallel arrangement of rail and road.

The preferential option of the 1982 Study was the crossing near the existing bridge. The advantages of this variant were: i) optimal connection of the Farap settlement with the city of Chardzhev, ii) optimal location related to transit traffic flows and traffic to northern Turkmenistan, iii) stability of the river bed (and the shortest) and lowest need for embankment construction, iv) maximal use of existing railway links, stations, installations, etc. The only disadvantage is the problem of crossing the city of Chardzhev by heavy transit road traffic. From the point of view of decision making under Soviet frameworks the most effective technical solution was the construction of a combined double deck bridge for two railway tracks.

First discussions held with state and railway authorities show that, in general, these assumptions are still valid, but some new ideas and developments must now be taken into consideration:

- the volume of road traffic forecast for 2000 included only a small proportion of transit traffic; now more than 80-90 % is transit traffic with a high proportion of heavy lorries which will cause additional problems in the city of Chardzhev
- the previously planned high volume of rail traffic (more than 60 train pairs per day) is not realistic, thus, there is no necessity to plan for a double track railway bridge

- the priority of the road traffic problems (the present situation is absolutely unacceptable) might be higher than the problems of the railway crossing (this has to be confirmed during the project)
- some new ideas were discussed concerning the solution of bridge construction: i) building of a new road bridge with an option for a railway crossing (common bridge piers) at first and the railway bridge within 10 years, ii) building a new railway bridge at first, after this rehabilitate the bridge piers of the existing rail bridge and use them for a new road bridge; iii) rehabilitate the existing railway bridge and build only a new road bridge (may be not close to the railway bridge to solve the problem of transit traffic through the city)

In general, the local authorities have dropped the idea of a double deck combined bridge. In case of construction of a combined bridge they now preferring a single deck bridge with common piers for rail and road. The main reason is the lack of funds for a more complicated bridge and the possibility of time separation between implementation of road and rail bridge.

Time schedule of railway passenger services crossing the Chardzhev bridge

Train Number	Train Route	Traffic Days
Long Distance Trains		
a) Foreign Trains		
21/22	Almaty (Kaz)- Nukus (Uzb) / Nukus - Almaty	two times a week
53/54	Tashkent (Uzb) - Nukus (Uzb) / Nukus - Tashkent	two times a week
63/64	Tashkent (Uzb) - Kungrad (Uzb) / Kungrad - Tashkent	three times a week
193/194	Andizhan (Uzb) - Urgentch (Uzb) / Urgentch - Andizhan	once a week
917/918	Tashkent (Uzb) - Bejneu (Kaz) / Bejneu - Tashkent	daily
b) Turkmenian Trains		
197/198	Chardzhev - Kelif / Kelif - Chardzhev	two times a week
Suburban Trains		
6401/6402	Zerger - Farap / Farap - Zerger	daily
6403/6404	Chardzhev - Farap / Farap - Chardzhev	daily
6405/6406	Chardzhev - Farap / Farap - Chardzhev	daily
6409/6410	Zerger - Farap / Farap - Zerger	daily
6411/6412	Zerger - Farap / Farap - Zerger	daily
6413	Chardzhev - Farap	daily
6418	Farap - Chardzhev	daily

Feasibility Study for a new River Crossing over the Amu-Darya River near the city of Chardzhev (1982)

List of Received Material

Full Name of the Material:

"Documentation material for the construction of a new crossing bridge over the Amu-Darya River near the city of Chardzhev"
elaborated by the former Soyuzdorproyekt Institute (leading company of the consortium), the Giprotransmost Institute Moscow and former Alma-Ata Giprotrans Institute Almaty (now Kazgiprozheldortrans)
("Обосновывающие материалы строительства мостового перехода через реку Аму-Дарья у города Чарджоу")

Volume 1 "Summarising explanations" (Soyuzdorproyekt Institute)
("Сводная пояснительная записка")

Volume 2 "Road links and access roads" (Soyuzdorproyekt Institute)
("Автодорожные подходы")

Volume 3 "Road bridges" (Soyuzdorproyekt Institute) *This volume does not exist in Turkmenistan. Because of the former Soviet rules for observance of secrecy it was only safekept in Moscow (Project Institute and Ministry of Transport Construction)*
("Автодорожные мосты")

Volume 4 "Rail links" (Alma-Ata Giprotrans Institute)
("Железнодорожные подходы")

Volume 5 "Rail bridges and combined bridges" (Giprotransmost Institute)
("Железнодорожные и совмещенные мосты")

"Expert opinion of the Scientific and Technical Council of the Ministry for Road Construction and Maintenance of the Turkmenian Soviet Republic concerning the Documentation material for the construction of a new crossing bridge over the Amu-Darya River near the city of Chardzhev"

("Заключение научно-технического Совета Министерства автомобильных дорог Туркменской ССР по Обосновывающим материалам строительства мостового перехода через реку Аму-Дарья у города Чарджоу")

Correspondence concerning the results of the 1982 Study with expert opinions of the former Soviet Ministry for Transport Construction, Head Department for Bridge Construction, the former State Committee for Construction Problems of Turkmenian Soviet Republic as well as the former Soviet Ministry of Railway Transport (1983-1984)

Expert's Judgement¹

of the Scientific-technical Board of the Ministry of Road Transport of the Turkmenian Soviet Republic regarding the material for the building of a bridge over the river Amudarya near Chardzhev

The material justifying the effectiveness of the building of a bridge over the river Amudarya was worked out by the institute „Soyusdorprojekt“ with the support of the institutes „Giprotransmost“ and „Alma-Ata Giprotrans“ by order of the Ministry of Road Transport of the Turkmenian Republic and the Ministry of Railway Transport of the Soviet Union.

When preparing the material data of economic and technical investigations worked out within the period 1979 - 1981 was used as well as material investigating the effectiveness worked out by the institutes „Mosgiprotrans“ and „Giprotransmost“ in 1952 - 1953 and by the institute „Soyusdorprojekt“ in 1971.

The bridge planned to be built is situated on the motorway Samarkand - Chardzhev - Krasnovodsk² which is important for the whole country and on the railway line Tashkent - Chardzhev - Krasnovodsk.

The relevance of working out these materials is founded on the fact that a fundamental improvement of the conditions of goods transport over the river Amudarya is required. At present vehicle transports are realised by not very powerful ferries not having permanent landing stages and there is a high number of short-distance railway and waterway transports which cause considerable inefficient costs. The existing single-track railway bridge built in 1896, is in need of a total reconstruction including the exchange of the span and a part of the piles. According to calculations the annual losses of goods and passenger transport over the river Amudarya amounts to more than 4 million rubles.

The necessity of a solution for the bridge building is well-founded by the considerable increase of the volume of road as well as railway transport in the future. In 2000 the intensity of road traffic will increase by 9 times and amount to 4.600 - 4.900 vehicles per day, railway traffic will increase by 1.4 times and amount to 66 couples of trains per day.

Basing on the analysis of possible variants for the location of a bridge over the river Amudarya which were considered in former projects and feasibility studies, for the technical and economic comparison three competitive variants for the bridge building were taken into consideration:

- 1st variant: in the region of the wood's edge near Yumalanda, 13 km upstream from the existing railway bridge
- 2nd variant: within the borders of Chardzhev, 250 - 300 m downstream from the existing railway bridge
- 3rd variant: along the future border of Chardzhev, 8 km upstream from the existing railway bridge

For each variant the expediency of the building was considered as for the case of separate railway and road bridges as well as for a combined bridge. Railway bridges were assessed with spans of 66 to 132 metres and piles - single-track and double-track -, road bridges of different types of construction and with spans of 66 to 300 metres and width of the carriage way of 11.5 metres. The combined bridges repeat the concept of the railway bridges with the arrangement of roads and rail tracks at one and two levels.

The comparison of the constructions and types of the bridges shows that the more useful variant would be the building of a combined bridge with piles for two railway tracks and an arrangement of railway tracks and roads in 2 levels.

¹ like a summary of the studies of 1981-82 done by Turkmenian Road Transport Ministry in 1982 in former Soviet times

² now: Turkmenbashi

The realised technical and economic calculations comparing the variants of possible locations for the bridge show the economic efficiency of the bridge building according to variant No. 2 which also was recommended by the institute „Soyusdorprojekt“. The main indicators for the comparison of the variants are as follows:

N°.	Indicator	Unit of measurement	Figures:		
			1st variant	2nd variant	3rd variant
1	length of railway running-ups	km	<u>37.2</u>	<u>4.4</u>	<u>30.5</u>
			37.2	4.4	30.5
2	length of road running-ups	km	<u>29.3</u>	<u>22.5</u>	<u>24.4</u>
			20.9	2.0	16.3
3	length of the bridge	metres	<u>2360</u>	<u>1830</u>	<u>1870</u>
			2360	1830	1870
4	capital expenses, in total	million rubles	<u>146.02</u>	<u>106.54</u>	<u>142</u>
			140.13	87.39	128
	of them for the bridge	"	<u>97.77</u>	<u>80.1</u>	<u>92.5</u>
			97.77	80.1	92.5
	for the railway running-ups	"	<u>26.25</u>	<u>4.94</u>	<u>24.5</u>
			26.25	4.94	24.5
	for the road running- ups	"	<u>22.0</u>	<u>21.5</u>	<u>25.0</u>
			16.11	2.35	11.6
5	transport running costs per year in total	"	4.07	2.95	3.9
	of them for railway transport	"	1.7	0.76	1.49
	for road transport	"	2.37	2.19	2.41
6	costs planned ³	"	180.27	130.71	174.
7	cost recovery	years	-	6	-

Remarks: numerator shows total building costs
 denominator shows first stage of building

The variant for the bridge recommended ensures the decrease of building costs in comparison with the other variants by a total up to 40 - 52 million rubles, improves the transport connection directly between the towns Farap and Chardzhev, demands less running costs with railway transport and excludes the use of expensive arable land.

The Scientific-technical Board of the Ministry of Road Transport of the Turkmenian Soviet Republic approves the work realised by „Soyusdorprojekt“, appreciates the excellent quality and considers it useful to project and build the bridge as recommended in the material, according to the 2nd variant the Soviet Ministry of Railway Transport agrees with, too.

However, in connection with the planning the proposal of the Ministry of Transport regarding the building of a combined bridge should be considered.

President of the Scientific-technical Board, Minister

Secretary of the Board

³ capital costs taking into consideration running costs

List of equipment, which is necessary for instrumental measurement and inspection of railway bridges

(1. draft of a list of requirements for equipment to be financed from the project budget for material costs)

N°	Name of equipment	Number	Remarks
1	Tension-compressing testing machine PSYXL (with 50 t power)	1	for specification of the mechanical characteristics of the metal
2	Pendulum impact testing machine (Mechanical hardness drop tester)	1	definition of the impact strength of the metal
3	Schmidt - Sclerometer (Schmidt - Hammer)	1	definition of the strength of concrete by non-destructive methods
4	Geiger - Universal measuring instrument	1	definition of vibrations and deflections of metallic supporting structures of bridges
5	Recording vibration meter (Vibrographe)	1	definition of axial, transversal and horizontal vibrations of tops of bridge piers
6	Mechanical extensometer (Hugenberger-Meter)	10	measurement of tensions in components of metallic supporting structures of bridges
7	Echo sounder	1	depth measurement
8	Mikroskop x 50	1	
9	Loupe x 10	2	
10	Surveyor's level (first class)	1	

undersigned by the director of Turkmentransmost



**Chardzhev
railway station**

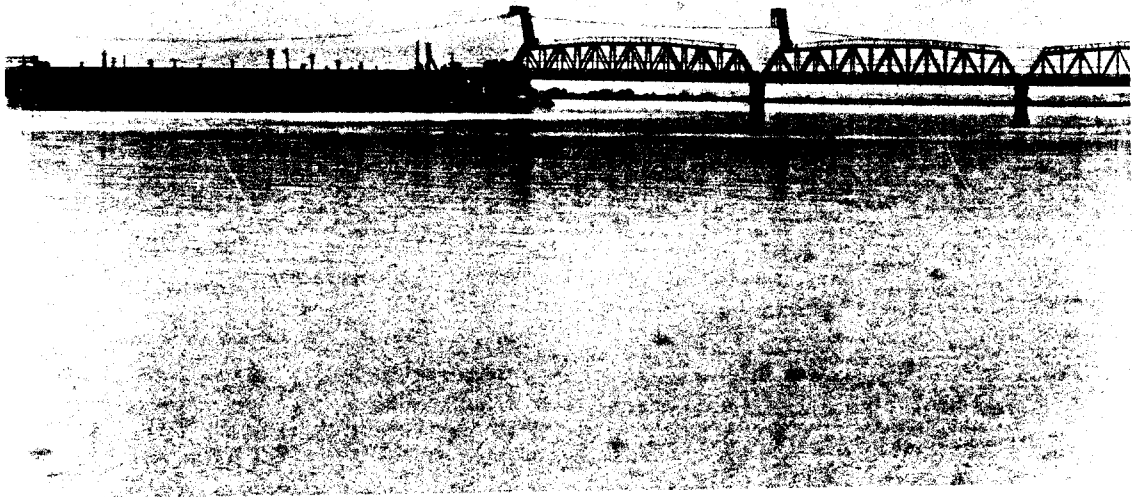


**Chardzhev railway station
Train Tashkent - Nukus running through the bridge**

**Railway bridge
(from the Farap side)**



**Railway bridge
(Farap side)**

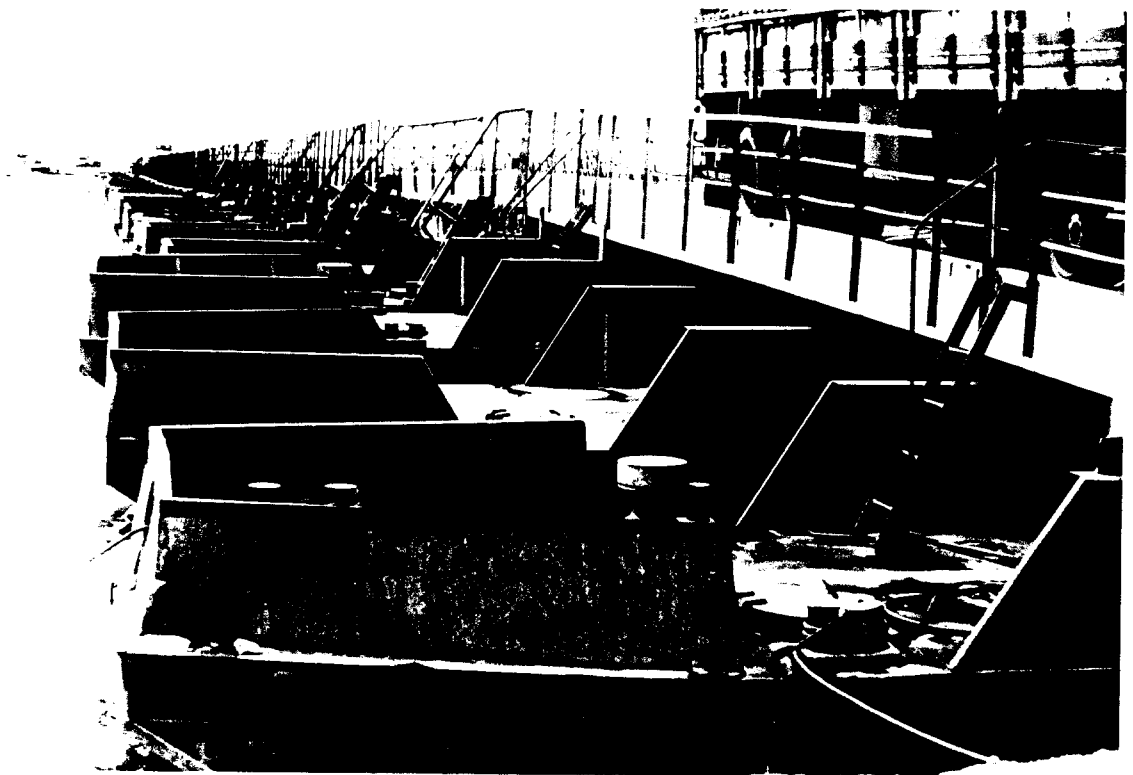
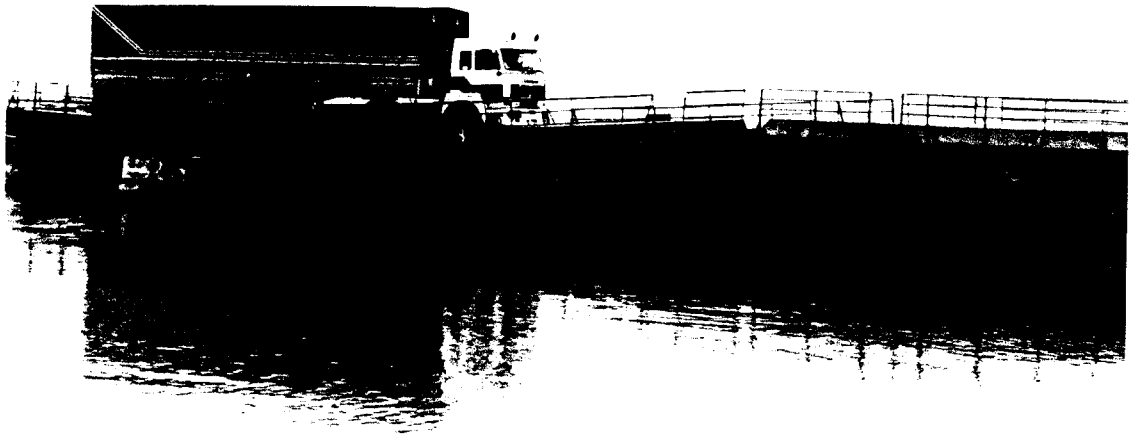


**Railway bridge
(View to Chardzhev side)**

Running up to the pontoon bridge
(Chardzhev side)



Pontoon bridge



Pontoon bridge - Rising of the bridge
(Farap side)



Pontoon bridge



Pontoon bridge
(arising differences in altitude between the neighbouring pontoons caused by swaying of the pontoons under the weight of lorries crossing the bridge)



ANNEX 7

Selected questionnaires and guide supports for the collection of data basis and performance of traffic counts and surveys

Module A Upgrading of railway line Bejneu - Aktau in Kazakhstan

Question Program to WS 1100 Traffic Forecast

1 General information about the line

- general plan about the course of the line, the stations, villages and towns in the catchment area of the line
- length of the line in total
- names of the stations on the line open for goods and passenger traffic
- names and length of the individual sections between the most important stations (sections), e.g.: Bejneu - Ustyurt, Ustyurt - Say-Utes, Say-Utes - Shetpe, Shetpe - Mangyshlak, Mangyshlak - Aktau
- number of trains in goods traffic per day and direction
- number of trains in passenger traffic per day and direction
- Has the port of Aktau a direct railway connection?
- What importance has the line for the inland traffic in Kazakhstan and for the international traffic (also considering forwarding/ receipt via port of Aktau) with the CIS and other countries?

2 Analysis of goods traffic on the line

2.1

number of goods trains (in 1995 and present dates of 1996 respectively)

- per day, week and year
- per direction (Aktau - Bejneu and Bejneu - Aktau) in total and by sections (as pt. 1)
- number of goods trains by kinds of trains (local goods trains serving single stations, through trains serving big stations, block trains, container trains, goods trains with border crossing traffic to/ from CIS countries and to/from other countries, mixed trains for goods and passenger traffic)
- Is there a timetable for goods trains or do the goods trains run regularly respectively? With which regularity (daily, several times a week, once a week, several times a month)?; estimation by kinds of trains

2.2

running of goods trains by kinds of trains

- origin and destination of goods trains
- railway junctions contacted
- shunting yards contacted

2.3.

annual volume of goods traffic of the line (in net t and tkm)

- of consignment
- of receipt

by main groups of goods

years: 1994/1995, possibly first months of 1996

2.4

estimation of the general development of goods traffic on the line during 1990 - 1995

- traffic volume, among this block trains (in net t)
- freight traffic performance (in ton km)

2.5

capacity of the different sections (traffic volume forwarded per year and on average per day), differentiated by directions Aktau - Bejneu and Bejneu - Aktau

2.6

average capacity of goods trains by directions and kinds of trains

- net t/train
- number of goods wagons/ train

2.7

consignment and receipt of goods traffic per station

- volume of goods transport of consignment and receipt (in net t) in total and by main natures of goods per year (1995)
- average consignment per day or per month respectively and fluctuation of volume of traffic (peak periods, off-peaks, deviation from average consignment in %)
- structure of consignment/ receipt of block trains, wagon groups and single wagon loads (shares in net t or in %)
- How the door-to-door delivery to/ from the station is organised (by railway branch tracks or branch lines or by road)?
- modal split in door-to-door delivery between rail and road (net t)

2.8

survey of main consignors/ receivers in goods traffic per station

- name, production profile, number of employees, turnover per year (1994 or 1995)
- annual goods consignment/ receipt by groups of goods and by important delivery relations (origin/ destination giving place, region or country) on the whole (all traffic branches)
- among this: annual goods consignment/ receipt by groups of goods and by important delivery relations (origin/ destination giving place, region or country)
- Is there a direct railway connection?
If yes, transshipment in t per year (consignment/ receipt).
- Are there - besides the railway traffic - also consignment/ receipt in goods traffic by road? Is this goods traffic by road important for regional traffic (up to 200 km) or/and for long-distance traffic over large distances?
- How is modal split between rail and road in consignment/ receipt (in % or quantities)
- Why consignment/ receipt of goods traffic by rail is preferred (big transshipment quantities in consignment/ receipt of goods, use of special goods wagons required, speed, more favourable charges, insufficient infrastructure of roads)?
- estimation of economic situation of the main consignors/ receivers in view of the future development of goods traffic demand:

Are there stable supplier relations or do these relations often change because of the market situation? Which supplier relations will be important during the next few years? Will the supplier relations change substantially or remain relatively constant? Which development of the consignment/ receipt volume of the main consignors/ receivers should be expected during the next few years (increase, constant level, drop and on which scales (in %, possibly in feasible ranges)?

- What is the average forwarding distance per consignment in consignment/ receipt (railway and road)?

ad 2.7 and 2.8

For getting the differentiated data required an analysis of the consignment notes of the consignor/ receiver for this line and for a period of approximately 3 months is possible, too, according to the data in pt. 2.7 and 2.8. The choice of the period should be representative, i.e. it should facilitate a projection of the determined structures for the year. In addition, it would be possible to do a survey of the local goods traffic department.

2.9

Are there industrial or agricultural enterprises realising their goods traffic exclusively by road?

If yes, which enterprises (name, place, range of production, supplier relations)?

2.10

carriage charges of railway and road traffic

- Are there any tariffs for railway goods traffic?
If yes, what is the regional area of validity for national traffic (line, railway direction, railway administration, country) and for border crossing traffics?
- railways: charges for exemplary relations within the line and beyond it (charge per t and per ton km or for one heavy goods vehicle with an average capacity, differentiation of the charges by natures of goods and by regional and long-distance traffic if existing)

2.11

importance of the port Aktau to the goods traffic on the line

- ship lines across the Caspian Sea, contacting port of Aktau
- transshipment of the port in t per year, by groups of goods and consignment/ receipt
- How many tons will be transhipped by rail (consignment/ receipt)?
- How many tons will be transhipped by road (consignment/ receipt)?
- important relations of goods traffic (origins/ destination of the goods transhipped)
- plans for increase of capacity of the port and for establishing of further ship lines across the Caspian Sea including the port

3 Analysis of passenger traffic on the line

3.1

timetable for passenger traffic

3.2

number, train running and temporal distribution of the passenger trains per day:

- regional trains indicating train running (departure/ destination stations)
- long-distance passenger trains indicating train running (departure/ destination stations) including trains in Kazakhstan and trains to/ from other CIS countries and further countries respectively
- Which of the trains have sleeping cars or couchette coaches respectively?
- matrix of travelling time in regional traffic (travelling times between neighbouring stations)
- matrix of travelling time in long-distance traffic (travelling time between Aktau and Bejneu, between different intermediate stations on the line and to more distant destination stations beyond Bejneu)

3.3

number of tickets sold per station by kinds of tickets and origin/ destination

3.4

regional structure of passenger traffic on the line (by departure/ destination stations)

- number of passengers between the different departure and destination stations on the line in regional and long-distance traffic (O/D-matrix)

ad 3.3 and 3.4

If the data needed are not available it is foreseen to carry through a combined counting of passengers/ survey of passengers on the line. The counting programs, questionnaires and the organization of realisation will be prepared with the support of the local partner at a later date during the realisation of the project.

3.5

Fares in passenger traffic

- regional traffic (exemplary relations, fare per passenger km)
- long-distance traffic (fare of different classes: seat, couchette, sleeping cars) for exemplary relations within the line and beyond it

3.6

bus traffic in the catchment area of the railway line

Is there any bus traffic (short-distance and regional traffic)

a) parallel to the railway routes?

b) as shuttle service to the stations?

If yes, which routes?

- travelling times of bus traffic in comparison with the travelling times of the railways (for comparable routes)
- fares of bus traffic in comparison with those of railway traffic (comparable routes)
- Does the bus traffic compete with the regional or long-distance traffic of the railways on this line?

3.7

Are there distinct streams of commuters in the short-distance and regional traffic (employed, trainees)? What are the main relations?

Do these streams of commuters mainly use the railways or the bus?

4 Socio-economic data about the catchment area of the line

4.1

towns and settlements along the line and in the catchment area of the line (region)

- name
- station existing yes/no
- distance to the next station, if there is no direct railway connection
- population in these towns and communities: number including employees
- number of places of work in the towns and other communities: in total including
 - industry
 - agriculture
 - service industry (trade, banks, education, health, cultural institutions etc.)

4.2

density of population (inhabitant/ km²)

- in municipal areas
- in rural catchment area of the line

4.3

degree of motorisation (number of cars/ 1000 inhabitants)

4.4

gross national product or gross national income per inhabitant in the catchment area of the line or in the region of West Kazakhstan

4.5

average income of the population (income per employee, family income, average size family)

4.6

level of industrial production and agricultural production per inhabitant (unit of value/ inhabitant)

4.7

volume of foreign trade of Kazakhstan with other CIS States and further important countries or countries in the region of the catchment area of the line

5 Future trends in the country and in the region with importance to the development of the traffic requirements (goods and passenger traffic) on the line Bejneu - Aktau

5.1

general trend of the economic development, especially of the West region of Kazakhstan

- privatisation of the economy
- development of the gross national product (industry, agriculture, service industry)
- development of prices in the goods and passenger traffic (maintenance of tariffs or price decontrol)
- planned investments in the catchment area of the line Aktau - Bejneu, especially industrial projects, agricultural projects, traffic infrastructure (concrete object, time horizon, realisation probability)

5.2

traffic policy of the Kazakh government, especially in view of a policy friendly disposed towards the railways

5.3

development of prices for the railway and road traffic to be expected (goods traffic, passenger traffic) in the region of the catchment area of the line and in Kazakhstan respectively

5.4

development of foreign trade

- development of foreign trade with the CIS States, especially the neighbouring countries, and the Caucasian republics
- development of foreign trade with the countries of the Near East and other countries, especially in the Far East and in Europe

5.5

development of relevant socio-economic data in the catchment area of the line Aktau

- Bejneu
- development of population
- development of the population's income
- development of the degree of motorisation

6 Existing studies, investigations etc. with importance to the line Aktau - Bejneu

**Module C New Road and Rail Bridge over Amudarya near Chardzhev/
Turkmenistan**

1 General information about the railway line crossing the railway bridge

- general plan with stations and further accesses for goods and passenger traffic for the lines or sections respectively: Bukhara - Chardzhev - Mary - Ashgabat and Mary - Kushka respectively
- Chardzhev - Bejneu - Makat

2 Analysis of the goods railway traffic

2.1

number of goods trains in the section Chardzhev - Farap per traffic direction and day, week and year (1995) by kind of train (block trains, transit trains, regional goods trains, other goods trains)

2.2

train operation of goods trains in the section Chardzhev - Farap: starting and end point of train formation (station, country), number of goods trains per day, week, year with the several train services

2.3

volume of goods traffic on the line Chardzhev - Farap or border Uzbekistan respectively per year (traffic volume in t in total and by goods groups, number of goods wagons in total and by kinds of wagon) and by traffic direction in total and by the following relations:

- domestic traffic in Turkmenistan
- bilateral border crossing traffic Turkmenistan - Uzbekistan
- transit traffic Kazakhstan - Uzbekistan, Uzbekistan - Uzbekistan, Kazakhstan - Kazakhstan, each via Chardzhev
- traffic in other relations (e.g. international traffic to and from China, Afghanistan etc.)

2.4

average use of the capacity of goods trains on the section Chardzhev - Farap and border Uzbekistan respectively (net t per train); if possible by the relations stated in 2.3

2.5

fluctuation of the volume of goods in the section mentioned, deviation from annual average volume;
reasons for fluctuation

2.6

average level of freight rates in railway goods traffic (per t or ton km)

- in domestic traffic
- in border crossing traffic (possibly for the various relations)

Are there tariffs for the whole railway traffic or for single traffics?

charges for typical exemplary relations and goods groups

3 Analysis of road goods traffic being of importance for the bridge near Chardzhev

3.1

What importance has the road goods traffic in the region?

Does it compete directly with railway traffic or are there services carried through in short-distance and regional traffic (max. 100 km)?

3.2

Are there statistic data about the traffic volume and the distance structures of road goods traffic?

If yes, which are there and how can they be used for the investigation?

3.3

Are there any results of traffic censuses of the traffic of heavy goods vehicles across the bridge?

If yes, can the data be provided?

3.4

carriage charges in road goods traffic

charges per t or ton km in short- and long-distance traffic

4. Analysis of passenger railway traffic

4.1

schedule for passenger traffic including all passenger trains running through the section Chardzhev - Farap

4.2

number of passenger trains on the section Chardzhev - Farap and border Uzbekistan respectively per day by:

- short-distance and regional traffic indicating departure and destination stations
- long-distance traffic indicating departure and destination stations as well as important intermediate stations, possibly countries, too

4.3

Is there any information/ data about the passenger railway traffic in the section Chardzhev - Farap?

If yes, which?

5. Analysis of passenger traffic over the road bridge near Chardzhev

5.1

Are there any bus routes over the existing pontoon bridge?

If yes, which (indication of departure and destination)

traffic volume (person per day) per destination

5.2

Are there any results of traffic censuses of the passenger road traffic (busses and cars) across the bridge?

If yes, can the data be provided?

5.3

Is the bridge of importance for the border crossing passenger traffic by bus or car?

If yes, in which respect (relations, e.g. Uzbekistan - Turkmenistan); amount of traffic volume

6. Socio-economic data for the catchment area of the future bridge

6.1

cities and settlements in the catchment area of the bridge (area approx. 100 km) as far as there is a road connection to the bridge

especially: Chardzhev, Komsomolsk, Farap, Sakar, Sayat, Eldtchik, Neftezavodsk in Turkmenistan

but also: settlements in Uzbekistan (Alat, Karakul, if there is a direct connection between these settlements and the region of Chardzhev)

Data needed:

- administrative structure of the region
- borders of the settlements
- inhabitants per settlement
- age structure of the inhabitants
- density of population per km²
- important enterprises (industry, agriculture, service industry, trade, others) in the settlements as well as number of employees
- important educational institutions (schools, universities) in the settlements with regional importance as well as number of training vacancies
- important cultural and health institutions with regional importance (theatres, cultural institutions, hospitals etc.)

6.2

Is there commuter traffic between the settlements in the catchment area of the bridge or do the inhabitants nearly exclusively work in their places of residence?

What importance has the close border Turkmenistan/ Uzbekistan to the regional traffic of the inhabitants across the two bridges existing?

Is there an intensive regional traffic across the border?

6.3

level of motorisation (number of cars/1000 inhabitants, separated by city and rural areas)

6.4

tendencies of development in the region around Chardzhev

- economy (industry, agriculture, service industry, others)
- investments planned as well as effects on the regional traffic across the bridge
- other trends with importance for the traffic demand
- development of population

6.5

trends of development in international traffic with importance to the bridge

- foreign trade between
 - Turkmenistan and Afghanistan/ Iran/ Near East
 - Uzbekistan - Afghanistan/ Iran/ Near East in transit via Turkmenistan
 - Kazakhstan - Afghanistan/ Iran/ Near East in transit via Turkmenistan
 - domestic traffic Uzbekistan in transit via Turkmenistan
 - Turkmenistan - Kazakhstan
 - China - Iran/ Afghanistan/ Iran/ Near East via Turkmenistan
 - all countries of the region with the Caucasian republics
- Are there plans regarding the extension of the proposals in international passenger railway traffic with importance to the bridge? (new routes, use of faster trains etc.)

7. Existing studies, investigations, traffic censuses, statistics with importance to the traffic over the bridge

Fact Finding Mission (Questionnaire)

WP 1210

Survey of existing situation

iv The rolling stock

Railways duty is to hand out to the expert all required data and information regarding the following matters:

Actual data on all kinds of rolling stock along the given line:

For goods transport both the overall and the available volume - (the technical reserve and the operational reserve) - of freight wagons stock broken down in universal and special wagons, such as closed wagons, open wagons, tanks, refrigerators, flat wagons (wagons for container and combined unit load traffic) and others;
weight of loads of the wagons

For passenger traffic both the overall and the available volume of passenger coaches stock for long-haul and suburban traffic;
carrying capability of the passenger coaches

The volume of the tractive stock and its availability

Information about the actual suitability of the rolling stock for the normal operation on the given line in terms of

- age structure of wagons, coaches and locomotives
- condition of the wagons, coaches and locomotives stock
- how many no-operational wagons, coaches and locomotives (technical reserve, operational reserve and damaged units) are accumulated and places where these carriages are waiting to be repaired

Information about repair and maintenance facilities

- the allocation of repair plants, repair shops, wagon depots, etc. and their scope of works
- the existing equipment inside the facilities and its age
- the capability of the facilities (level of covering of the maintenance demand)

Information about the spare parts situation and possibilities of procurement

- spare parts storing
- spare parts production by the railways
- spare parts procurement inside the region and needs of import

WP 1210

Survey of existing situation

iv The rolling stock - maintenance facilities

Railways duty is to enable the expert and to prepare for him as follows:

Visit a freight wagons depot

Visit a freight wagons repair shop

Visit a coach depot

Visit a locomotive depot

**Module C New Road and Rail Bridge over the Amudarya near Chardzhev/
Turkmenistan**

**1 Addendum to the Question Program / Road traffic over the pontoon
bridge**

In addition to the Question Program handed over information about the following complexes will be required:

1.1

number of vehicles crossing the bridge in 1995 and from January - June 1996 by directions and types of vehicles (heavy goods vehicles, passenger cars, busses), as annual data and data for months January - December

1.2

fluctuation of traffic volume crossing the bridge:

- Which months and which days of the week are those with the lowest and the highest volume of vehicles (data in absolute numbers or in % of the annual and week average respectively)?

1.3

price lists for toll charges, by classes of vehicles

1.4

toll revenues in total in 1995 and 1996 (January - June)

**2 Realisation of a traffic survey of the volume of vehicles crossing the
bridge**

2.1 Realisation of a cross-section count on the bridge

2.1.1 Objective

determination of the traffic volume over the existing pontoon bridge by traffic directions, classes of vehicles and temporal spread of the traffic volume over an average day

2.1.2 Period for the realisation of the cross-section count

The cross-section count should be carried through on three successive days with average traffic volume which would be as follows:

- a) Tuesday - Thursday,
- b) Wednesday - Friday or
- c) Monday - Wednesday

The decision on the most suitable period for the cross-section count should be made in co-operation with the local authorities. The period chosen should best reflect the average volume of traffic as well as should be the most representative of the general traffic volume crossing the bridge.

The count has to be carried out on the three days selected each in the period from 6 a.m. up to 8 p.m. without any breaks.

For the time between 8 p.m. and 6 a.m. the traffic volume should be estimated in co-operation with the bridge operator as well as analysing the documents about the collection of tolls.

If possible the count should be executed within July.

2.1.3 Organization of the count

- The count will be realised using **counting sheet A**.
- The count will be realised by directions, type of vehicle and by hours in separate.
- Each vehicle crossing the bridge has to be registered in the list by making a stroke.
The number of all strokes per field has to be summed up in the corresponding field.
- If the field is filled a new sheet has to be used. The sheets have to be consecutively paginated by the person counting.
- All lines and columns per sheet have to be summed up.
- The persons counting have to position themselves in a way that all vehicles passing can be seen and registered.

The count has to be carried out exactly because the results serve as an important basis for the building specification of the new bridge planned as well as for the calculation of future toll collections.

For the count a sufficient number of persons realising this work taking as a basis that one person is able to count 500 vehicles per hour at most.

2.2 Interview survey of drivers using the bridge

2.2.1 Objective

For the completion of the information got from the cross-section count a survey of the drivers using the bridge is needed. The objective of this survey is to get complementary information about the traffic streams crossing the bridge, about the origin and destination of the vehicles, the kind of load, the number of persons in the vehicles and their travelling purposes.

2.2.2 Period of the realisation of the interview survey

The survey will be carried through within the same period as the count of vehicles (see pt. 2.1.2).

2.2.3 Amount of the survey

All drivers of vehicles passing the bridge in the period determined have to be interviewed.

2.2.4 Organization of the survey

For this survey **questionnaire B** will be used. The drivers will be only asked those questions which are included in the sheet.

For each vehicle a new sheet has to be used. The interviewer will ask the driver the questions and records the answer by marking the appropriate fields with a cross or a putting in number (questions 5 and 7) respectively.

As a rule the answers only have to be marked in the appropriate fields with a cross, hand-written additional remarks shall be put in only in the fields provided for. There should be sufficient interviewers in order to be able to interview all drivers of vehicles.

Counting Sheet A

Cross-section count of the pontoon bridge near Chardzhev, Part I 6 a.m. - 1 p.m.

date of the count

day	month
-----	-------

sheet No:

name of the counter:

Direction: (to be marked with a cross)

Chardzhev - Farap	
Farap - Chardzhev	

Time	Number of vehicles by classes of vehicles						sum of vehicles
	heavy goods vehicles/ four-wheeler	heavy goods vehicles/ six-wheeler	heavy goods vehicles/ with more than six wheels and semi-trailer units	passenger cars	busses	other vehicles	
6 a.m. - 7 a.m.							
7 a.m. - 8 a.m.							
8 a.m. - 9 a.m.							
9 a.m. - 10 a.m.							
10 a.m. - 11 a.m.							
11 a.m. - 12 a.m.							
12 a.m. - 1 p. m.							
sum of vehicles 6 a.m. - 1 p.m.							

Counting Sheet A
Cross-section count of the pontoon bridge near Chardzhev, Part II 1 p.m. - 8 p.m.

date of the count	day	month	sheet No:	name of the counter:
-------------------	-----	-------	--------------------	----------------------

Direction: (to be marked with a cross)

Chardzhev - Farap	
Farap - Chardzhev	

Time	Number of vehicles by classes of vehicles						sum of vehicles
	heavy goods vehicles/ four-wheeler	heavy goods vehicles/ six-wheeler	heavy goods vehicles/ with more than six wheels and semi-trailer units	passenger cars	busses	other vehicles	
1 p.m. - 2 p.m.							
2 p.m. - 3 p.m.							
3 p.m. - 4 p.m.							
4 p.m. - 5 p.m.							
5 p.m. - 6 p.m.							
6 p.m. - 7 p.m.							
7 p.m. - 8 p.m.							
sum of vehicles 1 p.m. - 8 p.m.							

Questionnaire for survey of users of the pontoon bridge near Chardzhev

date of the count	day	time	sheet No:	name of the interviewer	
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Question 1: direction (to be crossed where applicable)

11 Chardzhev - Farap		12 Farap - Chardzhev	
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Question 2: type of vehicle (to be crossed where applicable):

21 heavy goods vehicles/ four-wheelers	22 heavy goods vehicles/ six-wheelers	23 heavy goods vehicles/ with more than six wheels and semi-trailer units	24 passenger cars	25 busses	26 other vehicles
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Question 3: country of registration of the vehicle (to be crossed where applicable: country/area):

31 Turkmenistan	32 Kazakhstan	33 Uzbekistan	34 other countries of CIS
35 Iran	36 Afghanistan	37 Turkey	38 other countries

Question 4: origin and destination of the transport (to be crossed where applicable: country/area):

41	Origin/ country of origin	43	Destination/country of destination
411	Iran	431	Iran
412	Afghanistan	432	Afghanistan
413	Turkey	433	Turkey
414	Kazakhstan	434	Kazakhstan
415	Uzbekistan, Oblast Bukhara	435	Uzbekistan, Oblast Bukhara
416	Uzbekistan, other regions	436	Uzbekistan, other regions
417	Turkmenistan, city of Ashgabat	437	Turkmenistan, city of Ashgabat
418	Turkmenistan, Velayat Achalskij	438	Turkmenistan, Velayat Achalskij
419	Turkmenistan, Velayat Balkanskij (e.g. Turkmenbashi, Nebit-Dag)	439	Turkmenistan, Velayat Balkanskij (e.g. Turkmenbashi, Nebit-Dag)
420	Turkmenistan, Velayat Maryiskij (e.g. Mary, Bajramali)	440	Turkmenistan, Velayat Maryiskij (e.g. Mary, Bajramali)
421	Turkmenistan, Velayat Dashkhovuskij	441	Turkmenistan, Velayat Dashkhovuskij
422	Turkmenistan, Velayat Lebapskij (Chardzhev)	442	Turkmenistan, Velayat Lebapskij (Chardzhev)
423	other countries of CIS	443	other countries of CIS
424	other countries	444	other countries

Question 5 with goods transports: Which kind of good is carried? (to be crossed where applicable)

Food, agricultural products 51	Mineral oil products, petrol, paraffin etc. 52	Building material (stones, cement, building equipment etc.) 53	Chemical products, fertilizer 54	Machines, vehicles, industrial semi-finished and finished products 55
Iron and steel products 56	Consumer goods, textile products 57	other products 58		

Question 6

61	weight of the load (in t)
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Question 7 with passenger transports: purpose of travelling (to be crossed where applicable)

Business 71	Holiday, visit to relatives 72	Private reasons (shopping, visit of authorities etc.) 73	others 74
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Question 8

81	number of persons per vehicle
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Remarks:

3200 Inspection of Existing Bridge and Possible Refurbishment
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TABLE OF ACTIONS AND QUESTIONNAIRE

All results of investigations and the answers to questions have to be documented in proper easy legible form.

Column P	to be answered or executed by foreign expert = PSM
Column L	to be answered or executed by local experts or workmen

3200-1 Actions for Preparation of Inspection; results should be available if inspection starts

No.	Actions and Questionnaire	P	L
1.1	SUBSTRUCTURE INVESTIGATION		
1.1.1	Examination of water flow, situation of sandbanks		X
1.1.2	Plan of bridge situation and river, with flow of water and sandbanks, drawings of the piers, drawings of bearings		X
1.1.3	Investigation: Changes of water flow and sandbanks during the last years (should be 10 years or more)		X
1.1.4	Height of normal water level, flow speed at normal water level		X
1.1.5	Height of high water level (if possible over 10 years or more)		X
1.1.6	Survey of river bed ground in the surrounding of piers (surrounding = distance 0 to 10 m to the pier) by measuring depth from normal water level (casting the lead); 2-m-distance-measurement in the direction E, SE, S, SW, W, NW, N, NE; five piers should be selected which are situated in the main water flow but not on land. That means 40 measurement points per pier		X
1.1.7	Measurement of pier inclination: the deviation of each of the piers of the whole bridge out of the vertical to indicate the overhanging; one measuring in the axis of the bridge, one measuring perpendicular to the axis of the bridge per pier = 26 measurements; the inclination in mm/m has to be recorded		X
1.1.8	Condition of the piers (cracks, chipping, rust colour, reinforcement visible etc.)		
1.1.9	Type of bearings and material (e.g. fixed, roller, steel, cast steel etc.)		X
1.1.10	Condition of the bearings, position of the bearings (out of center, shifting of upper bearing plate to lower bearing plate in mm) together with measurement of structure temperature		X
1.1.11	Condition of the mortar below the bearings		X
1.1.12	Preparation of access to piers and bearings in worst condition; in any case at least one pier must be accessible		X
1.1.13	Preparation of tools for inspection; the following should be in good order and available near the piers to be inspected: see attached list "TOOL 1"		X
1.1.14	Photo-documentation available		X
1.1.15	Photographing permitted?		X

1.2	SUPERSTRUCTURE		
1.2.1	Drawings of the existing bridge (minimum: view, plan, cross section; five copies should be prepared), as much detail drawings as available		X
1.2.2	Statical computation of the existing bridge		X
1.2.3	Reports of inspections of the last years		X
1.2.4	Which span is in evidence in worst condition?		X
1.2.5	Preparation of access to the steel structure of the span in worst condition plus four additional spans; one of these must be the span on pier and bearings in worst condition; access should be possible to upper and lower chord in span center, cross and longitudinal girders all over the span, end frames; access means should be stairs, ladders, access trolleys or similar; all means must be safe according regulations for protection of labourers; safety belts and life jackets must be available		X
1.2.6	Time table of trains passing the bridge during the week		X
1.2.7	Preparation of train closing intervals to enable access to the steel structure; interval should not be shorter than two hours		X
1.2.8	Preparation of tools for inspection; the following should be in good order and available near the spans to be inspected: see attached list "TOOL 2"		X
1.2.9	Photo-documentation available		X
1.2.10	Photographing permitted?		X

3200-2 **Actions for Inspection;** results have to be documented in writing or by drawings

No.	Actions and Questionnaire	P	L
2.1	SUBSTRUCTURE INVESTIGATION		
2.1.1	Placing at disposal of two workmen to assist inspection		X
2.1.2	Placing at disposal of access car or trolley		X
2.1.3	Checking of the report results of No. 1.1.1 to 1.1.11 as evident	X	
2.1.4	Checking of the pier and bearings in worst condition; see checking list "CHECK 1"	X	
2.1.5			

2.2	SUPERSTRUCTURE INVESTIGATION		
2.1.1	Placing at disposal of two workmen to assist inspection		X
2.1.2	Placing at disposal of access car or trolley		X
2.1.3	Checking of the report results of No. 1.2.3 to 1.2.4 as evident	X	
2.1.4	Checking of the superstructure; see checking list "CHECK 2"	X	