EUROPEAN UNION - TACIS

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

TRADE AND TRANSPORT SECTORS

Terms of Reference

for

TRAFFIC AND FEASIBILITY STUDIES

Final Recipients:
TRACECA Region Ministries of Transport

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ALL MODULES

1. Background

1.1 Needs of Beneficiaries

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 Soviet Union (FSU).

Armenia,	Kyrgyzstan
Azerbaijan	Tadjikistan
Georgia	Turkmenistan
Kazakhstan	Uzbekistan

The objectives of the conference were:
- to stimulate co-operation 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

TRACECA (Transport Corridor Europe Caucasus Asia) was thence created as a component of the TACIS interstate programme. The states above are refereed to as the TRACECA founder states (TFS).
Regional sectoral Working Groups (trade, rail, road, maritime), composed of experts and officials from each TRACECA state and European Union (EU), have been established as part of the TRACECA programme. They meet periodically. They have inaugurated specific projects including this present one, and will monitor results. Members are drawn from Ministers of Transport and Trade, who form the recipient partners of this project.
Mongolia, Ukraine and Moldavia have subsequently been admitted to the TRACECA program.
A TRACECA Co-ordinating Team has been set up, with permanent offices in both Central Asia and the Caucasus.
Beneficiaries of this project are:
- the Ministries of Transport (where existent) and Departments responsible for transport in the Cabinet of Ministers, of the eleven TRACECA countries
- national rail transport operating companies
- national port and maritime authorities

Ministers of Economy and Departments of Statistics may be involved as counterparts, as appropriate in each country.
The beneficiaries are more specifically stated in the tasks for each module.
This project regroups themes developed from problems and opportunities identified by the TRACECA Working Groups and by TRACECA projects carried out previously. It is divided into five modules as follows:

		Approx. percentage budget	
Module A	TRACECA Traffic Data Base and Forecasts	50	%
Module B	Caspian Sea Shipping Services	10	%
Module C	Rehabilitation of the Aktau Port Ferry Terminal	10	%
Module D	Navigation Channel for Turkmenbashi Port	5	%
Module E	Transport of crude oil and oil products on the Caspian Sea	25	%

The maximum total project budget available is ECU 2 000 000
Project duration 24 months

Module A is the common Module to providing input to the others.
Output from Module E is of the highest priority

1.2 Problems to be Addressed

1.2.1 Module A - TRACECA Traffic Data Base and Forecasts

A considerable amount of traffic, network characteristics and tariffs data has been accumulated by previous TRACECA projects. These have included:
- TRACECA Traffic Forecasting
- Central Asian Railways Infrastructure Maintenance Module C - Chardzev Bridge Feasibility Study
- Caucasian Railways Infrastructure
- Pavement Management Systems

- Roads Maintenance (Modules D & E)
- Ferry Terminals Baku and Turkmenbashi
- Management Training Baku Port
- Poti Port feasibility study
- Railways Tariffs and Timetables
- Central Asian Railway Restructuring
- Caucasian Railways Restructuring
- Trade Facilitation (Border crossings survey)

In particular the first mentioned of the above projects developed a comprehensive data base, a freight traffic forecasting application based on the Saturn model, and installed this in the eight TFS. Recommendations on the institutionalisation of the data base and forecasting capability were made by the project and some training was provided.
Many problems were revealed and persist. They are summarised as follows:

- There is a fundamental lack of knowledge in the TRACECA region of the principles of traffic forecasting, and indeed of transport economics in general
- There is a general shortage of professional staff with basic computer skills
- The modelling methodology adopted in the Traffic Forecasting project was too sophisticated for the circumstances. The variables used and presentation of output was opaque. Saturn was not well adapted to freight modelling. Software translation into Russian is extremely complicated. Previous TRACECA projects which have attempted to introduce specialist software have had limited success and sustainability (eg. Saturn, Rosy PMS, ...)
- There was not and is not systematised collection of transport data in the region. Existing data collection systems are paper based, inconsistent, and inaccurate
- To varying degrees in each country, traffic and customs data are considered commercial, or even state, secrets
- There is regional sensitivity on sharing of traffic data, while there is competition between states to manage a regional data base
- Decision making for transport system development in the region is traditionally based on political rather than economic criteria, which sidelines the ultimate economic utility and importance of quality transport data
- Within the parallel projects listed above, the various consultants' staff found difficulty in collaborating on their traffic forecasts. Data was sometimes shared by consultants only with extreme reluctance.
- Very little traffic survey work has been carried out by TRACECA or other projects, so that inconsistencies in data provided from counterpart sources cannot be corrected with confidence, and practically no data has been rigorously validated
- While tariffs can be determined, the underlying costs of production are not well known, even by the operators, so that the sustainability of present tariffs is questionable
- The economies of the region are in transition from centrally planned to free market forms, and consequently the characteristics of demand are not determined uniquely by one form or the other. The rate of transition is likewise uncertain. New relationships between such inputs and outputs as population, gdp, and traffic, are immature and fickle.
- A major proportion of rail and maritime traffic is of petroleum products including crude. Several pipelines will be commissioned in the foreseeable future, which could much effect the demand for rail transport
- A second major source of traffic is agricultural products, such as cotton for export, soy for import, and wheat both ways. These vary from year to year according to harvest yields, contracts for supply, and other factors, which are difficult to model.
- Certain zones in the region, particularly parts of the Caucasus, are politically volatile and traffic fluctuates according to non-economic and non-technical variables
- Non-physical barriers to trade are emerging as a key determinant issue of future transport flows into, out of, and through the TRACECA region

The preceding problems render traffic forecasting in the region difficult to model, but the need for good quality traffic data and forecasts remains very high. Several of the region's states are potentially wealthy and highly creditworthy. If sound traffic data could be made available, the development banks would be more prepared to advance credits for transport projects
TRACECA reports generated to date contain the most comprehensive data base existing, and have been extensively used by other donors for investment decisions. The categories of data available from counterpart sources are believed to be fully known. Likewise the network characteristics are already quite well catalogued.

1.2.2 Co-ordination with Other Donors

Projects by other donors include the following:

World Bank

- Armenia roads sector
- Georgian transport sector (mostly roads)
- Kazakhstan roads sector

EBRD
- Georgian rail sector
- Azerbaijan rail sector
- Azerbaijan roads sector
- Ports of Poti, Azerbaijan, Turkmenbashi, Aktau
- Kazakhstan, Uzbekistan, Turkmenistan Rail sector loans (under negotiation)
- Turkmenistan roads sector

Asian Development Bank
- Kazakhstan roads sector
- Kyrgyzstan roads sector
- Uzbekistan rail sector

OECF
- Rail and road sector projects in Kazakhstan
- Intermodal terminal and gauge change projects in Central Asia

Islamic Development Bank
- Road sector projects in Azerbaijan, Kyrghystan, Tajikistan and Kazakhstan

In all of these projects TRACECA has been involved to various degrees, particularly as far as concerns the first three of the above mentioned institutions.

This project is intended to stimulate investment in the transport sector within the TRACECA states, so that the consultant carrying out this project will be expected to co-operate with other donors to the fullest degree possible. This will involve meetings with Consultants appointed by other donors, provision and exchange of data on a systematic or on-demand basis. Common reporting with Consultants from other donor programmes is in general quite permissible.
At the TRACECA Working Group Conference held in Tbilisi in May 1998 the organisation ESCAP presented a project entitled 'Trade Facilitation Transport Corridor Europe-Asia'. TRACECA has furnished reports from previous projects of interest to the ESCAP initiative. The present project will be particularly attentive to complementary actions, collaboration, exchanges of information and cross referencing in reports, with the ESCAP initiative.
A report entitled A Comparative Analysis of Routes to the Far East has been prepared by DG7. Its' content should be taken into account by this Module. Likewise, several reports have been published by ESCAP and should be considered.

1.2.3 Module B - New Caspian Sea Shipping Services

The Caspian Sea region is rich in natural resources and is expected to become one of the worlds most dynamic economic growth areas. The Sea itself should become a major transport interface between Europe and Asia. At present much remains to be done to realise this potential.
There is a general interest in the establishment of new shipping services and lines. Kazakhstan is entirely dependent on foreign shipping lines for its export-import trade to the west through Caspian Sea ports (principally Azeri and Iranian vessels calling at Aktau). In fact the viability of a new line or service would be largely dependent on such factors as:
- demand
- tariffs
- charter rates, running costs
- availability of qualified crews
- availability of quality management
- availability of maintenance facilities
- the legal, regulatory and political environment of:
  - the Caspian
  - the Volga-Don
  - the Black Sea
- the physical condition of the Volga-Don canal

These factors are similar, whatever the ownership of a line (national, private or state, JV with or without a foreign partner). The ownership and place of registration would impact such factors as taxation.
Local authorities claim that there is a sufficiency of qualified mariners in the region. Certainly TRACECA state-owned vessels operate in the Mediterranean, on the Baltic and Black Seas. However, they report that local mariners possess limited familiarity with international standards and practices.

1.2.4 Co-ordination with Other Donors

No other donors or external assistance agencies are known to have shown interest in the issue of shipping on the Caspian Sea. One other donor has cited clarification of legal issues and regulations as a first priority to allow external investment.
TACIS is undertaking a study of Inland Water Transport in Russia, including the Volga-Don.
A previous Tacis project entitled Development of the Caspian Shipping Company is also of relevance
Investment opportunities would be of obvious interest to the private sector, and to the investment bank agencies which specialise in private sector development.
Private sector maritime investors have declared (very preliminary) interest in the Caspian and the consultant would be expected to collaborate with such investors.
A TACIS national project in Azerbaijan will probably run concurrently with this project and will deal with the creation of an Azeri MOT, the creation of an Azeri Maritime authority, and the restructuring of the Caspian Sea Shipping Company.
The consultants involved must hold an early co-ordination meeting, exchange information freely, avoid duplication and generally collaborate.

1.2.5 Module C - Rehabilitation of the Aktau Port Ferry Terminal

The northern branch of the TRACECA corridor passes through the Port of Aktau. It is the preferred routing by Kazakhs for their traffic, as obviously it increases revenues to the Kazak railways and the port of Aktau, relative to the more southerly route passing through other states.
The Port of Aktau is recovering from a decline in traffic, thanks to its ideal position for servicing the Tenghiz oilfields, and an increase in general cargo between other origins and destinations. There are however questions concerning its cash-flow and loan repayments. Oil is the major port revenue earner at present.
Between 1986 and 1992 the Port operated a ro-ro ferry service between other ports, principally Baku. According to reports the rail ro-ro facilities were never used. Due to the economic dislocation in the Caucasus, the ro-ro service was halted. The condition of the ferry ramp in Aktau has deteriorated due to age and lack of attention, so that today it is not operable. A technical mission has made a brief inspection of the facilities and reported on the requirements to re-commission the ramp and associated facilities.
The Port of Aktau has negotiated a loan of approximately 60MUSD from the EBRD for rehabilitation of the general Port facilities. This loan does not cover the ferry ramp.
The Ministry of Transport and Communications of Kazakhstan has called for tenders (firstly in 1997, lastly in early 1998) to propose re-development and operation of the ferry ramp on a concession basis. So far there have been no serious proposals. Oil companies are rumoured to be interested in opening the ferry terminal.
The port management considered a quick and cheap adaptation of the existing quay side to permit ro-ro operations for road transport. This is an interesting idea, and would test demand. However, expert observers have raised questions about the safety of such an initiative.
There are unresolved issues concerning the layout of access roads, holding areas, and facilities for customs and immigration procedures. These require attention in this project, for the ferry service to be fast, and for the unloading-loading procedures to be well organised.
The present main operator of ferries on the Caspian is the Caspian Sea Shipping Company. They have not expressed great interest in serving Aktau.
A new ferry service was recently inaugurated between Astrakhan and Turkmenbashi, using a Russian vesel.

1.2.6 Co-ordination With Other Donors

As the major creditor of the Port of Aktau the EBRD is interested in the outcome of this study and has declared willingness to consider financing the rehabilitation of the ferry terminal. The key issue for this Module is the potential contribution of the ferry service to the financial viability of the port. For this to be established, reliable robust traffic forecasts must be developed.
Other financing agencies or private investors might well be interested.
The consultant must collaborate fully with potential investors, and may have to adapt his planned work programme to satisfy questions which they raise.

1.2.7 Module D - Navigation Channel for Turkmenbashi Port

The main access channel to the port is via an excavated navigation channel, which is reportedly of insufficient depth, and poorly marked for the safe operation of vessels. The deepest draft vessels which regularly use the channel at present are the Caspian Sea Shipping Company ferries (4 to 4,5 metres). Occasionally tankers of deeper draft use the channel, and access by this type of vessel may increase in the future (reportedly 7 metres). The port is equipped to carry out its own dredging maintenance. According to reports this equipment is not ideal, but adequate.
The problem of draught, if it is in fact serious, could be compounded by a lowering of the level of the Caspian Sea. Considerable variations in the sea level are a historic fact. In recent years the continuation of operation of the ports has

been jeopardised by rising water levels, but in the past year a contrary tendency has been manifest. No deterministic methodology for the prediction of future sea levels has been discovered. For the design of port improvement works currently planned, a stochastic method was applied.
The EBRD is already committed to invest substantially in the port, which will impose a financial burden on the port as long as the loan remains outstanding. There is no desire to invest in further works or equipment unless it is fully justified. However, the navigation channel is vital to the survival of the port.
Preliminary technical commentaries on this problem have been prepared by consultants. A clear indication of the risks, technical solutions, and costs of assuring uninterrupted future port operations is now required.

1.2.8 Co-ordination With Other Donors

The EBRD is interested in the results of this Module.

1.2.9 Module E – Transport of crude oil and oil products on the Caspian Sea

The importance of oil to the economies of the region cannot be over-emphasised. Also, the strategic implications for the European Union are major.
This Module concerns **(1)** specific forecasts of the transport of crude oil and oil products on the Caspian Sea, **(2)** an in-depth evaluation of the available infrastructure (storage, maritime transport, filling and emptying of vessels and reservoirs) and **(3)** specific feasibility studies for the oil terminals at:

- Dubendi (near Baku, Azerbaijan)
- Aktau berths 4, 5 and 8
- Turkmenbashi

1) The first component is a specific case of module A, and further elaborates it for the vast oil fields in the Caspian Sea region. The reserves of crude oil in those fields are believed to be major, and will help satisfy demand both in the region and on the world market well into the twenty-first century. Moreover, the FSU countries on the Caspian Sea have an interest in refining the extracted crude oil locally, thus adding value in-region rather than further downstream, and satisfying local demand for petrol products. As refined oil products and certain local crudes are reportedly inconvenient or difficult to transport by pipeline, transport by ship and train is lokely to continue.
2) The second component evaluates the existing infrastructure for transport of crude oil and oil products on the Caspian Sea. This infrastructure consists of oil terminals near the ports of Aktau (Kazakhstan), Turkmenbashi (Turkmenistan) and Baku (Azebaijan) - equipped with facilities for pumping, conditioning and storage - and a fleet of vessels built or adapted for the transport of crude oil and oil products. The infrastructure will be evaluated on technical design, capacity, extension potential, state of wear, operational suitability, obsolescence, safety, environment and staff requirements.
3) The third component builds on the second for the specific case of the oil terminals at Dubendi near Baku (Azerbaijan), and Akatu berths 4, 5 and 8. It prepares bankable feasibility studies, comprising technical and financial analysis of total rehabilitation (at long term), intermediate rehabilitation (medium term) and urgent rehabilitation (short term).

1.2.10 Co-ordination With Other Donors

Links with the TACIS Interstate programme 'INOGATE', dealing with energy, are obvious.
The EBRD takes interest in the development of all three ports concerned, is committed to certain investments (see Section 1.2.1). A study of oil traffic through the Port of Aktau has already been carried out by the EBRD with TACIS "Bangkok" funding. The present project will be more comprehensive and far reaching. Likewise, TACIS Bangkok funding may be used for specific project development in the ports concerned, dependent on the feasibility study to prepared by this module.
As the reserves of crude oil and natural gas in the Caspian Sea are huge, various international consortiums and multinational companies are active in the area, and might well be interested.
The consultant must collaborate fully with potential investors, and may have to adapt the planned work programme to satisfy questions which they raise.

MODULE A - TRACECA Traffic Data Base and Forecasts

2. Rationale and Objectives

2.1 Overall Objectives

End objectives of this Module are:

- to establish an autonomous TRACECA data collection centre(s) and forecasting capability, with established interfaces across the region. This should be linked to the TRACECA Intergovernmental Joint Commission project as the Joint Commission could be an ideal institution for managing maintenance and exploitation of the data-base and forecasts.
- to provide accurate traffic and other data sets to the accompanying modules

2.2 Project Purpose

This project module will:

- design, develop and institutionalise data collection methodologies and a management system appropriate to the region
- design, develop and apply traffic forecasting methodologies appropriate to the region
- identify and train local personnel to a level necessary to fully comprehend the methodologies and to be able to apply them autonomously. This is a prime requirement of the project, and tenderers should take full account of this in their technical propositions.

There is an intended large overlap between this project module and the others accompanying it. These other modules contain very real and major investment feasibility studies which will be thoroughly and rigorously scrutinised by the interested investors, particularly for the cash flows dependent on traffic forecasts. Hence a prime purpose of this module is to develop transparently logical traffic forecasting methods and apply them using unquestionably accurate base data.

A previous TRACECA feasibility study will be reworked within the scope of this module.

2.3 Results

The sought after results are:

- the establishment and maintenance during the project of a comprehensive and accurate TRACECA statistical transport data-base, in a single physical centre, or as a virtual centre having links with each country.
- the sustained institutionalisation of the data base on a regional basis
- that the beneficiaries become adept in the subtleties of traffic forecasting (a cadre of individuals in each beneficiary state)
- the production of rigorously accurate traffic forecasts for the feasibility studies of the accompanying modules
- the production of displays and synoptics of traffic flows in TRACECA (and on the neighbouring networks in so far as they may be necessary for the comprehension and appreciation of TRACECA traffic)
- assistance to other donors in provision of traffic data.

3. Risks and Assumptions

A number of onerous problems to be addressed were listed in a previous section. Failure to overcome such difficulties jeopardises the achievement of project objectives.
The project is a challenging assignment, intellectually, but above all in project field management. Consultants should consider carefully their ability to perform in the field environment before assuming the responsibilities of the project.
Three particular dangers are to be countered by the Consultant's management plan during the execution of this Module:

- The production of traffic forecasts by over-automated processes, producing numbers which common sense and a knowledge of the region's transport systems indicate to be unsound
- The isolation of the projects activities from local authorities and experts, by an over-emphasis on the technical as against the institutional and relational results expected of the module.
- Sufficient quality and quantity of local partners

4. Main Components

4.1 Tasks

The following basic tasks should be developed in the Technical Proposition. They are not limitative.
Passenger transport is not an overall concern of this module but should be taken into account in so far as it uses the same infrastructure and equipment as freight. Also, for the feasibility studies in other modules passenger traffic is definitely an important source of future revenues.

4.1.1 Geographic Focus

The states concerned for Module activities are:

Armenia,
Azerbaijan
Georgia
Kazakhstan
Mongolia
Moldavia
Kyrgyzstan
Tadjikistan
Turkmenistan
Uzbekistan
Ukraine

The contiguous states in the Caucasus and Central Asia will form the core of the project. The traffic database is to be comprehensive for links in these states.

For the other states (Ukraine, Moldavia and Mongolia) traffic connecting with the contiguous TRACECA region is to be the principal concern. This might include:

- TEN routings from the EU through Ukraine and the Black Sea PETRA to the Caucasus and Central Asia
- The potential traffic between Kazakhstan and Mongolia through China (these two states have expressed particular interest in opening trade in petroleum products)

The Volga-Don canal link as well as all maritime links on the Caspian, are most certainly to be taken fully into consideration by the module. Traffic south of the Caspian through Iran is likewise of interest. Visits to non-TRACECA Caspian countries may be necessary.
See also the cestion 4.1.11, concerning an overview beyond the borders of TRACECA countries.
National as well as international traffic is to be considered.
All states will be treated equally from the point of view of training and equipment supply.

4.1.2 Analysis and Inception Report Phase

Considerable previous Consulting work must be assimilated. Copies of relevant reports and the existing data base files must be borrowed from the co-ordination team in Brussels at the time of mobilisation, copied, and a comprehensive library or libraries with a structured document management system must be quickly established and maintained in the field offices.
The Team Leader should be responsible for ensuring that all team experts are fully versed in the previous relevant work done by TRACECA and others before they commence their missions.
Key counter-parts are to be identified and interviewed during the Inception Phase.
The results of this first analysis are to be included in the Inception Report.

4.1.3 Local Network for Data Collection

The consultant will appoint staff and establish a correspondent office in each beneficiary state.
This will form the basis of a network of correspondents for data collection.
Local staff and beneficiaries may not be expected to work for low or no cost to collect data for the consultant. The consultant must foresee the employment of local experts or sub-consultancy agreements with existing institutions.
The network should evolve during the course of the project into a sustainable "virtual institution" for future maintenance of the data base, with at least one node in each state capable of providing national and regional forecasts.
E-mail is available in all states and must be used. The Internet is accessible from all states, but not yet with sufficient robustness of connection.
Links should be formed with the TRACECA Intergovernmental Joint-Commission for Implementation of the Multi-Lateral Agreement.
Beneficiaries have in general agreed that a centralised TRACECA data base would be desirable but there is no agreement on where it should be based. A compromise solution may be the "virtual institution", or the establishment of a management link to the Joint Commission, or possibly another format may emerge. The question of long term financing of the data base maintenance activities should also be addressed within the project.
See also Training Section

4.1.4 Training and Regionalisation

It is extremely important that the local personnel involved in the project be brought together regularly for workshops throughout the project. These gatherings will serve as forums for:

- Development of the institutional aspects of the data base on an integrated, sustainable, regional basis
- Technical development of the data base and forecasting methodology by interaction with local experts so that it is created in a form which the local participants feel that they can adopt comfortably and use with ease
- Training

Training themes should include:

- The role of the data base and traffic forecasting as a management tool, with reference to regional realities (e.g. of local motives for utilisation of different transit routes), and not to Western European parallels which are too dissimilar
- Investment decision methodology
- Basic computer and data management skills
- The standard approaches to forecasting (eg. O/D matrices, econometric algorithms, step models,...)
- Survey techniques

Trainers should preferably be the project experts rather than pure training specialists, be seasoned practitioners, experienced in the region, or prepared very well by reading reports from previous TRACECA projects. All training materials such as slides should be in the Russian language. A local relevance should be evident for all the material. Dry presentations of theoretical aspects are to be avoided.

This Task is one of the key activities for the success of the module and tenderers are invited to explain in detail proven methods, or innovations, which they would apply, in their Technical Propositions.

4.1.5 Equipment Supply

The Consultant will propose and supply equipment packages to the beneficiary states sufficient to achieve the project objectives. At a minimum this should comprise, per state:

- One computer with printer, modems, etc.
- Standard office software (word processing, spreadsheet, database, e-mail,...)
- Mass data storage devices (zip storage or CD writers, to match the Consultants technical proposition for transferring data around the region.
- Photocopier

The consultant may or may not propose to supply traffic counting equipment. Sophisticated specialist equipment and software is best avoided.
Software provided should be the Russian language versions.
Equipment should be procured in strict accordance with TACIS guidelines. Tenderers should display knowledge of these guidelines in their Technical Propositions, or include in their team a specialist procurement agent with experience of TACIS.

4.1.6 Data base design, population and maintenance

4.1.6.1 The Data Base

The consultant will develop a data base which should be at least as comprehensive as that established by the previous Traffic Forecasting project. This involved:

- A global zoning system
- Macro-economic variables
- Commodity categorisations compatible with the OSJD categories, and national customs declarations
- Surface mode network characteristics
- Tariffs (very insufficiently in the previous project)
- Traffic, by commodity

The database for this project may be based on an extended version of the existing data base from the previous project, or be completely reworked, as the consultant sees fit.
Relevant non-numeric factors affecting traffic should also be compiled and incorporated in the data base. Journals specialising in the national economic development, Caspian Sea development, should be subscribed to and exploited (eg. Economist Intelligence, Petroleum journals, IMF publications,...). The data base should in general be fully comprehensive and the definitive repository of records of traffic movements in the region.
The consultant should issue a CD of the data base at maximum three monthly intervals.

4.1.6.2 Data Collection and Surveys

Data collection is to take place throughout the project and not be a one-off campaign. The institutionalisation of the data base maintenance is a principal expected result of the module.
It is not possible to design the database using fresh survey data only, and existent beneficiary sources must be fully exploited, but not exclusively so. No survey work was performed in the previous project and this was a serious omission. It is essential that field surveys be carried out for tariffs, for spot checks or limited screen line surveys validating traffic data supplied, origin-destination surveys, and spot comportmental surveys, to identify any systematic variables and elasticities which are determining network usage.
Specifically, origin-destination surveys for Baku-Turkmenbashi ferry traffic, Aktau general cargo traffic, and the Chardzev Bridge, are unavoidable. Dependent on availability of module resources it would be extremely useful to:

- survey Black Sea traffic into TRACECA (eg. through forwarders at Poti)
- survey new links such as the just opened Astrakhan-Turkmenbashi ferry
- discover the declared reasons why quite considerable quantities of goods arrive by road, when rail would appear to offer a so much cheaper alternative
- discover why some shippers prefer the southern and northern alternatives to TRACECA when apparently TRACECA is cheaper

Several routes compete with TRACECA, such as the Turkey-Iran-Turkmenistan link for road traffic, the Sarakhs-Bandar Abbas link, Baltic ports against Poti for cotton and other traffic. Existing reports do shed some light on this, but much is anecdotal and insufficient is known about volumes, determinant variables, or motives.
The seasonal nature of traffic should be investigated.
Previous experience of TRACECA projects indicates a limited utility for questionnaires, and consultants have offended beneficiaries in the past by leaving behind long questionnaires on whistle-stop tours, for collection later. Questionnaires should only be used in an interview session.
Tenderers are to explain their practical proposals for data collection in their Technical Propositions.
It is emphasised that transport of petroleum products is of specific and urgent interest for Module E of this project, so that the consultants programme should ensure correct co-ordination between the two.
Pipelines are the subject of the TACIS INNOGATE programme, and development of pipelines are of particular relevance in the region, as the major category of product presently transported by rail (and possibly by sea) is petroleum products, at least of terms of tonnage. The question of the impact of future pipeline developments on rail and maritime traffic and revenues is to be specifically addressed by the Module.

4.1.7 Design Forecasting Methodology

Several technical and practical problems relating to the forecasting of traffic in the region have been cited in previous sections. If the forecasting methodology to be adopted for this Module is called for convenience a model, one should not then fall into the trap of designing a "black box", which may be workable in the West, but cannot cope with the discontinuities of variables and non-technical influences encountered in the TRACECA region.
The model should:

- preferably be developed and run on a standard spread-sheet
- from inception be bi-lingual English/Russian, and maintained as such throughout the project
- be developed during shoulder-to-shoulder interaction with local experts
- be transparent in functionality to local experts
- foresee operator/expert intervention and judgement at frequent points
- interface simply with the database
- be sensitive to the problems outlined in the Background section of these TOR
- produce simple comprehensible output reports, with neat (geo)graphics

For high quality graphics rather than other considerations, tenderers may propose the inclusion of a GIS in the data base/model, if such a package exists already in the Russian language, off-the-shelf, for the TRACECA region. Otherwise GIS is to be avoided, and may in any case distract from achievement of the expected results of the project.
The tenderer should include in his technical proposition:

- an outline conceptual and functional analysis of the methodology, including decision points and algorithms, which he proposes to adopt for the traffic forecasts
- simulated output reports including graphics

The tenderer's Technical Proposal should above all demonstrate sensitivity to the local situation.

4.1.8 Documentation of Database and Forecasting Methodology

The sustained adoption of the module by local authorities as well as experts is dependent on their appreciation of the technical utility and viability of the methodology. For this a comprehensive two part or bi-functional paper Manual must be

developed in parallel with the data base and model.
Part 1 is to concisely explain the role of the data base and model as a management tool with regional relevance to the highest authorities concerned with transport (Vice-Prime Ministers, Ministers, and CEO of operating entities).
Part 2 is to be the detailed operators manual
The Manual must be developed at the same time as the Model, in Russian. The English version is of lesser importance than the Russian.
The consultant should test the comprehensibility of the Manual on local authorities and experts, and adapt it accordingly.

4.1.9 Specific Traffic Forecasts

4.1.9.1 General Applications

This Module is to be adapted particularly, and applied, to produce whatever traffic forecasts are necessary for the feasibility studies comprising the other modules. The timing of the production of the forecasts to permit the feasibility studies to proceed, is quite sensitive, particularly for priority Module E. Hence the consultant in his technical proposition should provide a schedule indicating that he has allowed sufficient progress in the early phases.
It is important, for know-how transfer and sustainability purposes, that local staff carry out the forecasts, under the direction of the EU experts, using the methodology adopted above. During the course of the project, upon demand by local authorities, TACIS monitors, the TRACECA co-ordination team, or TACIS CU, local staff should be able to independently present and justify the forecasts.
The consultant should allow resources to produce a traffic forecasting case study of a similar scope to the forecasts for the feasibility studies in the other Modules. Provisionally, this will be to produce forecasts for the export of grain from the port of Aktau, for eventual inclusion in a feasibility study by others, for the construction of a grain terminal at the port. Clarity of presentation of results, and adaptation of the model to the study, so that others may develop on it, are obviously mandatory.

4.1.9.2 Chardzev Bridge

A feasibility study for construction of a replacement bridge for road and rail traffic has been produced by a previous TRACECA study, in draft form. A final study report was never issued.
The previous TRACECA feasibility study project adopted technical proposals from an FSU study which preceded it. Several options for the crossings were considered.
A critical review of the feasibility study will be carried out, verifying and modifying as appropriate the:

- traffic projections
- scenarios
- economic costs and benefits
- cash flow projections

The consultant will rework the traffic forecasting and economic and financial analysis of this feasibility study using data collected and the methodology from this present module. Given the strategic location of this bridge, traffic surveys at this location would in any case be of high value for determining flows through the region. Except for traffic data collection, this sub-module may be considered as a desk study. The previous project developed a strong technical case for one redevelopment option (construction of a new combined road/rail bridge). The technical recommendations of the previous report need not be questioned within the scope of this Module.
The module will deliver a completely re-edited feasibility study report. The report should be clear and comprehensive, requiring no cross referencing to the previous study, to the Module A report, or to any other document. Retained extracts from the other sources should be bound in, to present one coherent report.
The consultant is to calculate benefits and costs including Vehicle Operating Costs and Train Operating Costs for the with and without project scenario. Much relevant data (e.g. VOC, TOC) is to be found in previous TRACECA work. Several sub-scenarios may be needed as the traffic on the bridge could be influenced by developments a considerable distance away.
Cost-benefit analysis will be performed, providing NPV, IRR and other indicators that the consultant may consider appropriate. The financial calculations for the capital cost, debt servicing, maintenance charges, tolls etc. are to be distinctly separate from the economic analysis which will consider all of the benefits and costs, whether or not they lead to an accounting entry for the bridge owners and operators.

4.1.10 Synoptics and Communications, Brochures, Conferences

The Consultant is to allow resources in this Module to produce synoptics and displays:

- To provide overviews of TRACECA traffic and its evolution in Progress reports
- Overhead projector transparencies, for presentation at Conferences by the Consultant or by other TRACECA Consultants, or TACIS officers, etc.
- For inclusion in brochures, folders, exhibition displays, etc.

- To place on the Web site (see on)

An informative folder of a format to be agreed with the co-ordination team, summarisning for example TRACECA traffic flows, commodity types, O/Ds etc., is to be prepared by the module (A3 folded with A4 inserts, glossy colour, graphics, Russian and English text, 1000 examples)

4.1.11 Overview of Links to Europe and the TRACECA Neighbouring States

An overview is to be produced of traffic flows, times and costs between far eastern economic centres, the TRACECA countries, and the EU. This should include TEN routings through the Balkans, and links through Turkey, TEN links through Russia from the Baltic and Eastern Europe. Bottlenecks, physical or non-physical, should be identified.
The input for this overview should be the content of the detailed work in the preceding tasks, past available studies such as DG7 and ESCAP reports on the Trans Asian Land Bridge, and other readily accessible statistical sources. Liaison with other organisations should be foreseen. Cross-reference to other past or ongoing studies or multi-national organisation initiatives should be included, so that the overview is both a technically informative section and a co-ordination interface with non-TRACECA bodies.
The format of the overview presented should be both graphic and tabular.

4.1.12 Free Data Filling Station....Web Site

The consultant will organise his field offices to provide data base access and output upon request (eg. CD, and users manual) to other TACIS and TRACECA projects, and to other donors projects. The guidance of the Co-ordination Team should be sought before releasing data, but in general TRACECA sees nothing but advantage to beneficiary and EU interests, in full collaboration with, for example, consultants preparing feasibility studies in the TRACECA region for development banks.
At the Transeurasia conference held in May 1998 in Almaty the need for co-ordination between ESCAP, ECO and TRACECA was included in the final declaration. This project Module will be the particular vector for technical/statistical aspects of such co-ordination. The project will pay particular attention to making a full and illustrative presentation of its results at the Transeurasia conferences scheduled for May 1999 and May 2000. Other conferences are held periodically in the region and the project should allow for presentations, or support to presentations.
To a similar end, data will be made available on the TRACECA Web site (TRACECA.ORG), and must be prepared accordingly. This applies to the Module data base or components, but resources allowing, a special overview site will be prepared by the consultant with synoptics of the region in an attractive form, and information of interest to shippers (eg. published tariffs, times of shipment, particular localised problems or opportunities...). These could in fact be similar to the conference presentations mentioned above.

4.2 Implementation Procedures

The substantial technical steps required for project implementation have been integrated into the tasks preceding.
The project will thoroughly integrate with beneficiaries, counter-parts and local staff in the region and will be purely regionally based. All project technical activities and project management will take place in the region. No home-office activities are to be foreseen except mobilisation, procurement (if in EU), and logistics. All reports are to be written on site. No off-site Project Director is to be included in the team. It is crucial to the success of the project that there be a strong Project Director or Team Leader permanently on site with a full mandate to run the project, including its sub-contracts and consortia participants. There is to be a permanent project office in both the Caucasus and in Central Asia, from three months after commencement of the project, until its end. Some in-EU time for senior staff liaison with Brussels and the IFI may be foreseen.
It is particularly important that the execution of the Modules comprising this project be carried out in an integrated and orderly manner.
Local counterparts will not be expected to provide routine data collection or logistic support services. Local experts, seconded employees, or Institutions must be engaged as staff by the consultant for such tasks. Time allocated to local staff (as distinct from Counterpart staff) must be clearly shown in the proposal. There should be a balance between inputs from experts in the different TRACECA states.
The ratio of working time spent in the region relative to working time spent in the home office should be clearly visible in the consultants Technical Proposition, as should time allocated to local experts, which should be maximised.
Any assemblies of counterparts or local experts within the NIS are to be arranged entirely at the expense of the consultant, including travel and accommodation of participants. Likewise office space, interpretation, secretarial services, and all other inputs required for the purposes of the work are to be provided by the consultant.
The consultant will be required to attend regular Co-ordination meetings in the region, to collaborate fully with the TRACECA co-ordination structure, and the Monitoring Team, to collaborate with and possibly integrate operations with the proposed Inter-Governmental Joint-Commission, and to attend occasional co-ordination meetings in Brussels or other EU locations.

4.3 Rough Timetable

The mobilisation and analytical aspects of this module must be concentrated in the first three months of the project. This exceptionally long time is to take account of the dispersed location of the Module, and to allow for correct planning of the output from this Module, which is crucial to the feasibility studies in the other Modules.
Data collection and the development of the forecasting methodology are to be carefully scheduled and intensive after the mobilisation phase, to avoid any risk of delay, particularly to Module E.
Support to the data-base should be continuous throughout the project, as should the institutionalisation of the Module.
The preferred timetable implied in the preceding is for the activities of this Module to be carried out as an integrated programme, and to feed output to the other modules. An alternative is for the data collection for the other Modules to be carried out independently, then to assemble their output into a data base, and to add on whatever may be missing to make it fully regional. This alternative risks losing the synergies and economies of scale in collecting broad sets of data and designing surveys for a regional data base.
A pragmatic approach is probably the best, and hence the need for strong team leadership on site to maintain the integrity of the project.

4.4 Global Budget

Approximately 50% of the total project budget may be allocated to this module (module A).
Attention of tenderers is drawn to the high input required from local experts in the tasks, and this should be reflected in the budget.

MODULE B - New Caspian Sea Shipping Services

2. Rationale and Objectives

2.1 Overall Objectives

The overall objectives of this module are to define the conditions under which new shipping services or lines could be inaugurated on the Caspian Sea.

2.2 Project Purpose

The module should create a feasibility study or business plan for the establishment of new shipping services. It should detail the potential for such a venture, with reference very much to the present and probable future operating environment within the Caspian. The operating environment shall include the legal framework.
The module will provide in addition some support to local maritime professionals based in the TRACECA Caspian coastal states:

- Identify the professional mariners organisations and training institutions, and determine the new economic circumstances, and familiarity with international practices
- Design in collaboration with them a training or familiarisation programme, preferably for them to carry out autonomously (as follow-up to this module is not presently foreseen in the TRACECA programme)
- Provide basic documentation for such a program, and possibly some material support (eg. Computers, printers, photocopiers)

2.3 Results

The sought after result is that the beneficiaries decide on a well informed basis whether or not it is advantageous for them to pursue the idea of establishing new Caspian Sea shipping services.
Furthermore, the module output will clarify the opportunities for EU operators to enter the Caspian Sea, and be useful as a document for negotiating development bank support, if the basic economic circumstances are favourable.
The training component should satisfy beneficiaries request for some support from TRACECA to the mariners associations.
A legal and regulatory Annex to the report should point out specific actions required in the field of legislation, adhesion to and application of international norms and standards.

3. Risks and Assumptions

The establishment of a new shipping services on the Caspian is an ambitious idea, which should be carefully investigated before any operator, be it private or state owned, EU or local, invests in such an enterprise. It is unlikely that private EU operators would risk the effort necessary to undertake such investigation, so it appears appropriate for TRACECA to take this first step. This is to be an objective study and there is no predisposition to assume that there is a case to be made for the establishment of new services.
There is some risk to the clarity of the module output, in that the legal environment in the region is known to be confusing. Even so, the project would be worthwhile if it highlighted the details of such difficulties, so that corrective action could commence.

4. Main Components

4.1.1 Geographic Focus

The full beneficiaries of this module are:

Azerbaijan Kazakhstan
Turkmenistan

In so far as concerns the training module then the states of Georgia and the Ukraine should be added.
In particular Kazakhstan has requested this Module as it does not at present operate any vessels on the Caspian.

4.1.2 Traffic Forecasts – Demand Analysis

Maritime traffic forecasts necessary to identify the potential demand for shipping should be prepared within module A. They should be comprehensive and cover all categories of cargo transported on the Caspian, or out of it via the Volga-Don, or eventually up to the Baltic or Russian inland destinations, if their volume is sufficient to justify interest. The TACIS Russian IWT study might clarify this, but it will probably be necessary to carry out further investigative work.
State cargo quotas and long term contracts should be reported and taken into account.
Representatives of the major oil companies should be interviewed and intentions determined.
Tariffs should also be available from the data base.
The various alternative routes for all cargoes, the tariffs, times, facilities and inconveniences likely to determine demand should all be analysed.
The eventual split in demand due to the refurbishment and opening of new pipelines should be taken fully into account.

4.1.3 Availability and Operating Costs of Vessels

Investigations should cover:

- the availability of vessels appropriate to the foreseen demand, on charter or to purchase.
    - particular consideration of the availability of vessels to transport petroleum products between Dubendi, Turkmnebashi and Aktau, with reference to possible investments in the oil terminals which is the subject of Module E
- the total operating costs of the vessels, including harbour dues, Volga-Don fees, registration fees etc.

4.1.4 Technical Constraints on Navigation and Operating Shipping Services

Certain technical limitations exist and should be analysed, including:

- limitations on the use of the Volga-Don as an access channel for vessels to work on the Caspian, and to navigate into and out of the Caspian
- maintenance facilities for vessels
- navigation aids and possible unsafe operating conditions
- draught and tonnage limitations due to whatever factors

4.1.5 Personnel, Training

The question of the availability of human resources (crews), and training for mariners who might work or be re-employed on the Caspian Sea is to be investigated, and the present facilities for training such staff, is to be investigated. There are mariners associations whose institutional objectives apparently border on, or extend into, training, and advising Ministries on maritime questions. It may be opportune for the consultant to mobilise resources from such an association(s) to assist in the study.
In the course of the investigation the consultant is to pay attention, beyond the needs of the shipping services business plan, to training needs of local mariners. The consultant should recommend for the beneficiary states concerned their most advantageous strategy for providing future training needs:

- creation or support for national institutions, or usage of which regional institution
- probable numbers of personnel who should be trained annually in each necessary category of qualification
- the present reserve or lack of qualified staff, and opportunities for redeployment
- alignment of training practice and curricula content with international norms (e.g. International Convention on Standards of Training Certification and Watch Keeping for Seafarers)

Beyond recommendations, the consultant should provide some basic documentation to, and hold a regional seminar for, local institutions or organisations, in Russian, to familiarise them with international practice, and revise their training regimes to meet the challenges of the future.

4.1.6 Establishment of a Management Structure

To start new shipping services not just a business plan and financial backing would be necessary but also, just as essentially, a management structure would need to be set up or imported.
The consultant should investigate the position and intentions of all present operators on the Caspian Sea, and of any who express interest on operating there, particularly EU operators.
The consultant should propose options and recommend on this aspect.

4.1.7 Legal, Regulatory and Political Environment

The consultant should fully investigate and report on the legal and regulatory environment affecting shipping on and into the Caspian via Volga-Don.

The TACIS Azerbaijan national project "Reorganisation of the Transport Sector Administration In Azerbaijan" contains a Module dealing with the establishment of a Maritime Authority for Azerbaijan. The output from this is to include the legal environment and should be provide some input adaptable to the broader regional interest of this present project. Likewise the TACIS project "Inland Waterway Transport in Russia" should provide insights into the legal environment.
The consultant should point out the restraints and opportunities that this environment presents for the venture under study in this module. Five countries border the Caspian and it is quite possible that trade restrictive regulations and practices are applied by each to the net disadvantage of all (registration, technical standards, qualification of seamen, customs and immigration procedures, tariff rules,....).
Where the regulatory environment is hampering economic development of Caspian Sea traffic the consultant should make recommendations on changes needed. He should discuss such issues with the proposed TRACECA Intergovernmental Joint Commission.
There is a protracted disagreement on the status of the Caspian at least in so far as the exploitation of oil fields is concerned. This study should disassociate its work as far as possible from such non-transport sector fields.
Within this section mention is also made of the need to analyse factors such as:

- the national fiscal regimes applicable to vessel operators (no other TACIS projects are believed to deal in any way with this question)
- company and vessel registration,
- IMO membership, adhesion to and application of International Conventions in general.

4.1.8 Business Plan

The consultant should assemble all of the preceding analysis and discuss options for a possible new or extended shipping services with interested beneficiaries, development bank representatives and EU private operators.
He should formulate a full business plan including:

- The market segments or lines of business of most interest, why they are of interest and with what certitude
- A full financial analysis in sufficient detail and rigour to allow negotiations with possible financial backers
- A step by step development plan indicating the most potentially profitable programme to establish any such line (procurement of fleet, staffing, registration, sources of financing,..).
- The non-financial risks and opportunities presented by the venture

A separate annex should detail any legal and regulatory, or non-technical restraints affecting Caspian Sea traffic and to be resolved, and recommend to the TRACECA state governments, preferably through the Inter- Governmental Joint Commission, how to proceed (e.g. accession to and application of international conventions, model national regulations, simplified operating or control practices within present rules...)

4.2 Implementation Procedures

See Section 4.2 Module A

4.3 Rough Timetable

The study is to be substantially completed within 21 months, which is intended to allow time for orderly data collection and forecasting within Module A to feed into this Module, and for input from the Azeri national project.

4.4 Global Budget

Approximately 10 % of the total project budget may be allocated to this module.
Ample provision should be foreseen for local staff.

MODULE C – Aktau Ferry Terminal Redevelopment

2. Rationale and Objectives

2.1 Overall Objectives

The overall objectives of this module are firstly to reveal the investment merits of the redevelopment of the Aktau Ferry Terminal for road and rail traffic on the northern branch of the TRACECA route.
If there is shown to be investment merit, and the Ministry of Transport of Kazakhstan and the EBRD commence negotiations for the financing of the project, then documentation for tendering the works will be prepared.

2.2 Project Purpose

The module should:
- Refine, verify and complete previous technical investigations which have defined three options and related costs for opening the ferry terminal
- Develop financial projections for redeveloping and operating a ferry terminal
- Prepare and present a feasibility study based on the foregoing

2.3 Results

The sought after result is that the Ministry of Transport and Telecommunications of Kazakhstan, and the Port Authorities of Aktau, be provided with a feasibility study allowing them decide on a well informed basis whether or not it is advantageous for them to redevelop the ferry terminal.

3. Risks and Assumptions

The risks for the successful completion of the feasibility study are quite minimal. Previous similar studies have been completed successfully by TRACECA projects for the ports of Baku and Turkmenbashi.
The potentially most uncertain issue for the study is the traffic forecasts, and Module A of this project provides consultancy resources for the forecasts to be made with fully as much confidence as the state of the art and the local circumstances permit.

4. Main Components

4.1.1 Geographic Focus

The beneficiary of this module is the Ministry of Transport and Communications of Kazakhstan, represented by the Maritime Section of the Ministry and the management of the Port of Aktau.

4.1.2 Refine, Verify and Complete Previous Technical Investigations

The previous investigation carried out by TRACECA comprised a mission report which identified three options for re-opening the single-berth ferry ramp (road traffic only, road and rail, and variations on the shoreside facilities).
- Further engineering work is necessary, in particular to examine the condition of, and redesign:
- mechanical-electrical installations,
- the ramp structure,
- the civil works,
- whatever architectural facilities may be necessary (eg.ticketing, administration, specific customs and immigration facilities, etc).

Underwater inspection of the ramp installations should be foreseen.
A full site topographical survey should be produced.
The design of the access and holding areas for the ferry ramp land approaches needs to be finalised with the counter-parts (road, and rail links and parking areas, etc).
The role of Customs (also Immigration) operations and facilities needs to be properly integrated into the project. This should build on previous TRACECA projects (Trade Facilitation), in conformity with the TRACECA Multi-lateral Agreement and Intergovernmental Joint Commission. Customs authorities at the Port and in Astana should be involved.
The ferry terminal should be conceived to be adaptable to probable future changes in the level of the Caspian Sea over its design life.
The ramp design should correspond with the Baku and Turkmenbashi ferry ramps, as they will be rehabilitated within the presently planned TACIS/EBRD projects, to allow for:
- the full range of vessels which could eventually dock at those other ports.

- identical or greater tolerance for future variation of the Caspian sea level.
- similar loading and off-loading conditions for vehicles (permissible vehicle weights, profiles, etc.)

4.1.3 Traffic Forecasts – Demand Analysis

Traffic forecasts necessary to identify potential demand for the ferry terminal should be prepared within module A. They should be comprehensive and cover all categories of cargo which might be transported.
The principal correspondent port for the ferry service is Baku but others might be considered.
In a previous TRACECA study considerable road traffic was observed using the Baku-Turkmenbashi ferry and driving north through Aktau to connect with Russian destinations north of the Caspian. This high traffic was apparently temporary and due to the closure of a border during the Chechen civil war. This is an illustration of the need for great care in the preparation of the traffic forecasts.

4.1.4 Cost Estimates

Cost estimates for redevelopment works should be prepared on the basis of the tenders for similar works underway or foreseen at the ports of Turkmenbashi and Aktau (and Baku, if available).

4.1.5 Financial Projections

Financial projections should be made to allow appraisal of the ferry terminal redevelopment according to standard development bank criteria, and in particular those of the EBRD.
Current fees for berthing at Baku, Turkemenbashi and Astrakhan should be reported. The consultant should carefully appraise the range of fees which might be applied at Aktau, the sensitivity of demand, and the revenues which might be generated by the ferry ramp.
Operating costs should be estimated, as should depreciation, loan servicing and repayment.
The financial projections, tariffs, and their presentation should be discussed during the course of the project with the EBRD, to ensure satisfaction of that institution's criteria.

4.1.6 Environmental Due Diligence

An environmental due diligence study should be prepared according to EBRD criteria.

4.1.7 Recommendations for Redevelopment

The consultant is to present to the Ministry of Transport, to the Port authority, and to the EBRD, a detailed feasibility study containing his recommendations and justifications.
The study report should be sufficiently detailed, and of a format, suitable for inclusion in a Build-Operate-Transfer type concession tender, or a Design and Build tender, including well defined layouts, typical details, schematics, performance specifications, and design criteria.
A plan for ownership/operations/management options, and Customs procedures, is to be included.
The consultant is to respond to any questions raised on the study, but according to the Implementation Procedures for this project very close collaboration with the beneficiary on site is required throughout the work, so that questions should be minimal.

4.2 Implementation Procedures

See Section 4.2 Module A
Much of the work connected with this module should be carried out at the Port of Aktau.

4.3 Rough Timetable

The feasibility study is to be substantially completed in draught form within twelve months, which is intended to allow time for orderly data collection and forecasting within Module A to feed into this Module. The final report is to be presented two months later.

4.4 Global Budget

Approximately 10 % of the total project budget may be allocated to this module, inclusive of preparation of tender documents.
Adequate provision should be foreseen for local staff.

MODULE D – Navigation Channel for Turkmenbashi Port

2. Rationale and Objectives

2.1 Overall Objectives

The overall objectives of this module are to ensure the continued accessibility of navigation to the Port of Turkmenbashi.

2.2 Project Purpose

The module should:
- carry out field investigations and report on the siltation regime of the port access channel
- propose a maintenance plan to assure the security of navigation to the port.

2.3 Results

The project should deliver a detailed annual or periodic maintenance plan using as far as possible equipment owned by the port, or to be contracted, under a reasonable maintenance budget given the ports traffic and revenues.
The plan should assure that maritime traffic calling on Turkmenbashi is subject to no unreasonable delay or danger due to the condition of the access channel.
The results of the study should indicate clearly:
- the security of future revenues to the port from risks posed by any perceived present or future inadequacies of the navigation channels
- the costs of and dispositions for routine maintenance of the channel
- investment recommendations, or explanation why no investment is required

The module should deliver an investment plan, detailing whatever large or small capital works or equipment procurements are necessary to assure the overall objectives.

3. Risks and Assumptions

Several uncertainties are included in the background to this project. Different versions of consultants' and operators' commentaries exist, of the degree of severity of the problem of siltation, and navigational marking, for the access channel to Turkmenbashi port, and of the need or not for a sophisticated computer based study and maintenance plan to be developed. Given the difficult experience of previous TRACECA projects with sophisticated specialist software, these TOR choose to avoid such methodology altogether, whatever their technical merits. Previous consultants' commentaries do not make it clear whether the port will be able to carry out channel maintenance under their own maintenance budget or not.
There would appear little risk that this project cannot clarify the matter, but beneficiaries could disagree of the findings, with vessel operators calling for higher factors of safety, and port authorities claiming that the channel is adequate.

4. Main Components

4.1 Task

4.1.1 Geographic Focus

The beneficiary of this module is the Cabinet of Ministers of Turkmenistan, represented by the Vice-Prime Minister for transport and the management of the Port of Turkmenbashi.
Vessels of the Caspian Sea Shipping Company are the most frequent callers at the port, and their involvement in the project is also necessary.

4.1.2 Determination of the Existing Situation and Environment

- Review of previous consultants' reports and mission notes.
- Collection of existing charts and maps to describe the geography of the bay and channel system.
- Collection of existing data to determine natural conditions (hydraulic, meteorological, geophysical)
- Spot checks and surveys to confirm and augment the preceding
- Survey of channel markings
- Interviews with vessel operators
- Identification of current operational guidelines and practices, for vessel operations and for channel maintenance
- Identification of port services and equipment for assisting vessels during passage of the channels (pilot service, pilot vessels, radio equipment,…)

- Appraisal of past and present dredging practice, available equipment, staff, contractual arrangements, management practice, budget, suitability of locations for disposal of dredged materials,...)
- Identification of alternatives options for carry out dredging operations.
- Past, present and forecast traffic and revenues for the port (from Module A)
- Analysis of the possible impact of fluctuating water levels for the Caspian Sea
- Comparison between actual situation and international norms
- Relevance of international standards in so far as concerns Turkmenbashi port access, including draught parameters, lighting requirements etc.

4.1.3 Maintenance and Improvement Recommendations

- Review of the adequacy of the channel system, including layout, navigational aids, buoys, etc.
- Review of operational practices for channel navigation, including the ports services and equipment
- Recommend and justify possible operational improvement measures with respect to safety and continuity of operations, costs, benefits, environmental aspects
- Review the ports capacity to correctly maintain and dredge the access channel
- Recommend and justify a maintenance policy and working maintenance plan, with justifications for any changes from the present situation. Provide budget estimates for such a plan and relate it to expected port revenues and expenditures
- Recommend and justify any capital works or equipment procurement, if required, including costs, benefits, safety and environmental considerations
- Provide outline specifications for any equipment procurement, if equipment is required

4.2 Implementation Procedures

See Section 4.2 Module A

4.3 Rough Timetable

The module is to be substantially completed within twelve months, which is intended to allow time for orderly data collection and forecasting within Module A to feed into this Module, collection of existing technical data, arrangements of contacts with the port management, then a completion of this module within about four months.

4.4 Global Budget

Approximately 5 % of the total project budget may be allocated to this module.

Adequate provision should be foreseen for local staff.

MODULE E - Transport of crude oil and oil products on the Caspian Sea

2. Rationale and Objectives

2.1 Overall Objectives

The overall objective of the project is to ensure adequate and safe transport of crude oil and oil products on the Caspian Sea TRACECA routes. This will allow the countries bordering the Caspian Sea to fully exploit and export their natural resources, without unnecessarily endangering the sensitive ecology of the Caspian Sea. Oil revenues may help those countries to develop their economy in general, and their industrial apparatus in particular.

2.2 Project Purpose

The objectives of the present Module are :
(1) to forecast the transport of crude oil and oil products on the Caspian Sea (conjointly with Module A);
(2) to evaluate the existing infrastructure for transport of crude oil and oil products on the Caspian Sea; (oil terminals and links to their adjacent shore facilities) for transport of crude oil and oil products on the Caspian Sea, in terms of: technical design, capacity, extension potential, state of wear, operational suitability, obsolescence, safety, environmental impact, and staff requirements;
(3) to prepare feasibility studies;

- for the rehabilitation of the oil terminal at Dubendi, including a detailed engineering appraisal of urgent works required at berth No 3.
- for the rehabilitation of berths 4 & 5 at Aktau, and the adaptation of berth 8 to transfer of petroleum products
- for the oil berths at Turkmenbashi (less specific requests for assistance and previous consultancy work has been performed on the oil berths at Turkmenbashi)

2.3 Results

The results of this Module should indicate to beneficiaries and to potential investors the most appropriate investments to make in terminal facilities to ensure achievement of the Module's overall objectives.
The report should allow the beneficiaries to negotiate on an informed basis with IFI or private sector investors. It should be made possible for the beneficiaries to correctly value their present terminals and to estimate the cost of additional works required in future years.

3. Risks and Assumptions

It may be quite hard to get accurate and reliable information on the strategic oil reserves and in the Caspian Sea. Further, the extent to which those reserves will be exploited depends heavily on exogenous, market and political factors, such as the evolution of the region's economy, oil prices at the world market, political agreements and strategic alliances.

Without the findings of the technical investigations foreseen in this module, by independent consultants, there would be a risk that terminal improvement and operating concessions could be too hastily conceded to the most daring private sector operator, while in ignorance of the technical and commercial worth of the assets in question.

4. Main Components

4.1. Tasks

The beneficiaries of this module are the Cabinets of Ministers of Azerbaijan, Kazakhstan and Turkmenistan, represented by the Ministers for Transport and Communications, the Ministers for Energy and Mineral Resources and the Committees for External Investment. National shipping companies and terminal operating companies are also to be involved. In each of the concerned ports, the consultant should arrange regular common meetings of a "steering committee" type, involving all of the key players (port authorities, oil products transhipment operators, clients etc).

4.1.1 Geographic focus

The geographic focus of this Module is on the oil reserves, the oil terminals and the vessel fleet on the Caspian Sea. The main terminals are situated near Aktau (Kazakhstan), Turkmenbashi (Turkmenistan) and Baku (Azerbaijan).

4.1.2. Traffic Forecasts

Various information sources need to be consulted : traffic records, databases, forecasts and plans of the authorities and

players concerned, international media and organisations including specialist petroleum industry journals, multinational oil companies and traders, leading commodity exchanges for petrochemical products.
The divers information thus gathered must be analysed, validated, refined, assembled and extrapolated over the lifetime of the infrastructure assets under consideration.
The aim is to obtain a coherent range of forecasts for the main oil fields and oil terminals concerned.
Forecasts need to be broken down to location (oil fields, oil terminals, refineries, petrochemical plants), commodity (crude oil of the different grades extracted, refined products, petrochemical products), place of destination (domestic, neighbouring states, EU and world markets) and mode of transport (tanker, general purpose vessel, pipeline, rail, truck).
The sensitivity of the forecasts to uncertainties beyond the consultants control should be clear.

4.1.3. Evaluation of infrastructure transport, storage and transfer of crude oil and petroleum products

The existing infrastructure off-shore, on-shore and inland must be inventoried, as well as the present vessel fleet (included in Module C): location, nature, accessibility, dimensions, design parameters, operational, environmental and safety standards, available and presently used capacity, age, state of wear, maintenance and rehabilitation requirements, staffing etc.
The present ownership and operating management structures in place should also be noted, as well as tariffs charged, debts outstanding between operators etc.etc., as far as can be determined.
Plans for future infrastructure development should also be investigated, and appraised for probability of realisation.
This inventory should be represented in text and graphic form : on political, geological and topographical maps, in charts and in tables.
The existing infrastructure must then be compared to the demand forecasted in the previous section. The consultant will clearly point out any inadequacies (technical, operational, cost, non-conformity to international standards, staffing), surpluses and lack of capacity, investment requirements and opportunities, and threats encountered. Suggestions for improvements, and rough estimates of their costs and benefits will be made.
Special attention should be paid to the possibility of planned pipelines, the capacity limits of railways, and costs of transport by any mode, all of which will influence the future traffic through the Caspian port oil terminals.
The adaptation of non-oil berths to oil tproducts transhipment is to be considered (eg.berth 8 at Aktau).

4.1.4. Feasibility study for rehabilitation of the Dubendi, Aktau oil terminals, and Turkmenbashi terminals

The consultant will make a detailed technical survey of the present state of the oil terminals at Dubendi, Aktau berths 4,5 & 8, and Turkmenbashi, covering : facilities for berthing vessels, for pumping, conditioning and storing crude oil and oil products, technical design, capacity, state of wear and decay etc.
Underwater inspections should be carried out to determine any degradation of civil works.
The ship/shore interface is to be the principal focus of the study. The eventual use of larger tankers is also a key issue.
The consultant will make detailed plans for short term (emergency repairs), medium term (rehabilitation of vital parts) and long term (total rehabilitation, upgrading to international standards) rehabilitation of the berths and loading equipment including links from adjacent storage facilities.
Detailed cost estimates should be prepared.
The consultant should recommend possible ownership and operating structures which the beneficiaries could adopt, and a programme for concession tenders or other restructuring procedures, as the consultant may judge to be in the best interests of the beneficiaries. These should consider the berths, the equipment, and links back to the adjacent storage and conditioning facilities.
Recommendations on berthing fees, concession fees, should be formulated, and an overall financial plan for development of each element of the terminals should be developed.
Envirronmental impacts will be reported, according to IFI standards of due diligence.
Oil-spill contingency plans should be recommended for each port.
The consultant will maintain contact with and liaise with IFI throughout the project. An EBRD study is presently considering the development of petroleum berths 9 & 10 at Aktau. This development might include an outer extended breakwater and other measures which would would improve the availbility of all berths in the port. Scenarios to be considered by the consultant should take account of, and advise on such possible developments.
The consultant must discuss the project with private companies, but the interests of the beneficiaries should remain paramount.
Two complete and technical and financial feasibility reports of these rehabilitation plans will be prepared, for Aktau and for Dubendi according to typical IFI standards. The exact scope of work required at Turkmenbashi may be determined after the initial work carried out in the previous sections. In terms of resource allocation the consultant may assume that the work required will be comparable to that at Aktau and Dubendi.
The format and level of detail of the reports should allow for their eventual inclusion in concession tenders, or for later easy development of working drawings and works tender documents.

4.1.6 Solicitation for Investment

On the basis of the feasibility studies above, the consultant will create an Information Pack (eg.the Executive Summary of the feasibility report with graphics) and diffuse it to potential financing agencies, equity or operational participants, world-wide. He will actively encourage investment interest in the project by investors from the IFI and private sector.

4.2 Implementation Procedures

See Section 4.2 Module A
The consultant should foresee that one professional expert acts as module leader, and pilots most of the tasks foreseen in this module. All experts involved in this module should be of senior level. Overall expertise should include:

- Ports (quays and jetties) engineer
- Petroleum products handling engineer
- Petroleum economist/financial analyst
- Environmental impact appraisal and spill contingency planning

Local professional assistance should be engaged.

4.3 Rough Timetable

This module is to be considered as the most urgent component of the whole project, and the feasibility studies are to be completed within nine months of commencement of the project.
A technical deliverable based on Sections 4.1.2. and 4.1.3 is to be issued six months after project commencement.

4.4 Global Budget

Approximately 25% of the total project budget may be allocated to this module.

ALL MODULES

5. Reporting

All Inception Reports, Progress Reports for the whole project, and Deliverables for Module A (Manuals, CDs, case studies, etc.) , are to be delivered in the numbers, languages and locations as follows:

	Bound		Loose-leaf		Diskette
	English	Russian	English	Russian	(Eng.+Rus)
TACIS Brussels	2	1	0	0	0
TRACECA CU Brussels	5	1	1	1	1
TRACECA CU Tashkent	3	3	1	1	1
TRACECA CU Tbilisi	3	3	1	1	1
TACIS National CU (all 11 TRACECA states)	1	5	1	1	0
TACIS Monitoring Team, Caucasus, Central Asia, Europe	3 (1 to each location)	3			
Counter-parts	As necessary	As necessary	As necessary	As necessary	As necessary
Development banks and others	3		3		

A CD with the data-base and the forecasting methodology should be issued at three month intervals commencing in month six.

Technical Deliverables for Module B (New Shipping Services) are to be provided as follows:

	Bound		Loose-leaf		Diskette
	English	Russian	English	Russian	(Eng.+Rus)
TACIS Brussels	2	1	0	0	0
TACIS National CUs (Azerbaijan Kazakhstan Georgia Turkmenistan Ukraine)	2	5	1	1	0
TRACECA CU Brussels	3	1	1	1	1
TRACECA CU Tashkent	3	3	1	1	1
TRACECA CU Tbilisi	3	3	1	1	1
TACIS Monitoring Team, Caucasus, Central Asia, Europe	3 (1 to each location)	3			
Counter-parts	As necessary	As necessary	As necessary	As necessary	As necessary
Development banks and others	3		3		

Technical Deliverables for Module C (Aktau Ferry Terminal) are to be provided as follows:

	Bound		Loose-leaf		Diskette
	English	Russian	English	Russian	(Eng.+Rus)
TACIS Brussels	2	1	0	0	0
TACIS National CU Kazakhstan	2	5	1	1	0
TRACECA CU Brussels	3	1	1	1	1
TRACECA CU Tashkent	3	3	1	1	1
TRACECA CU Tbilisi	2	1	1	1	1
TACIS Monitoring Team, Caucasus, Central Asia, Europe	3 (1 to each location)	3			
Counter-parts	As necessary	As necessary	As necessary	As necessary	As necessary
Development banks and others	3		3		

Technical Deliverables for Module D Turkmenbashi Navigation Channel, are to be provided as follows:

	Bound		Loose-leaf		Diskette
	English	Russian	English	Russian	(Eng.+Rus)
TACIS Brussels	2	1	0	0	0
TACIS National CU in Turkmenistan	5	5	1	1	0
TRACECA CU Brussels	3	1	1	1	1
TRACECA CU Tashkent	3	3	1	1	1
TRACECA CU Tbilisi	2	1	1	1	1
TACIS Monitoring Team, Caucasus, Central Asia, Europe	3 (1 to each location)	3			
Counter-parts	As necessary	As necessary	As necessary	As necessary	As necessary
Development banks and others	3		3		

Technical Deliverables for Module E (Transport of crude oil and oil products on the Caspian Sea) are to be provided as follows (country specific reports are only to be made available in the country concerned):

	Bound		Loose-leaf		Diskette
	English	Russian	English	Russian	(Eng.+Rus)
TACIS Brussels	2	1	0	0	0
TACIS National CUs in Azrbaijan, Kazakhstan and Turkmenistan	2	5	1	1	0
TRACECA CU Brussels	3	1	1	1	1
TRACECA CU Tashkent	3	3	1	1	1
TRACECA CU Tbilisi	3	3	1	1	1
TACIS Monitoring Team, Caucasus, Central Asia, Europe	3 (1 to each location)	3			
Counter-parts	As necessary	As necessary	As necessary	As necessary	As necessary
Development banks and others	3		3		

Lists of addressees for each issue of the reports are to be provided to the TACIS CUs concerned. At least one copy of each report should be delivered directly to the key project counter-part in each country.
Copies of the Delivery Notes to all recipients are to be provided by fax to the three TRACECA co-ordination team offices.
The word processing programme to be used will be agreed with TACIS. The format of diskettes delivered should allow easy inclusion on the TRACECA.ORG web site.
The importance of high quality Russian texts, delivered on time, cannot be overemphasised. The reporting dates in this TOR are for the delivery of the Russian language text and the English language text to be provided at the same time.
Any software to be provided as a deliverable should be in Russian and in English, as should the manuals.
Reporting is to be in accordance with standard TACIS Guidelines, to cover administrative issues. These foresee:

Project Inception Report
An Inception Report shall be issued within 3 months of the start of the project (see note on languages above). 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.
The report distribution lists will be included.
Project Progress Reports
These reports will be submitted at the end of month 6, and month 12, and 18. They will cover progress to date.
Final Report
The Draft Final Report will be submitted at month 21 for comments and the Final Report at the end of Month 24.

Separate Technical Deliverables will be required to convey output foreseen in the Modules. Reports and technical deliverables, in particular feasibility studies, should be complete volumes for separate distribution, and not cross-reference with other modules.
The tenderer is to compose and provide in his Technical Proposal a schedule of separate Deliverables appropriate to specific Components of the Modules. Formal Draft versions are not required, but the contractor should carefully discuss the proposed contents with, and provide draft extracts upon request to the Beneficiaries, Monitors, and TRACECA co-ordination team, before issuing Deliverables.
All Reports must include an Executive Summary.
It would be incorrect to assume that changes to project scope which require changes to the project contract can be effected by a Report.

6. Factors Ensuring Sustainability

6.1 Institutional Appraisal

Module A – The need for the regional institutional establishment of the data base is woven into the tasks, and should be a principal occupation of the Consultant carrying out this project.
Module B – Institutional aspects of the creation of new services or a new line, and the changes necessary in the regulatory environment are emphasised. There could in the future be a need for follow up technical assistance to implement regulatory changes, but such needed changes should first be defined within this Module, and the scale of the problem identified.
Module C and E – Institutional development for operation of the proposed new or rehabilitated infrastructure is to be included in the feasibility studies.
Module D - Institutional aspects are relatively minor

6.2 Economic and Financial Appraisal

This feasibility studies included in this project are linked to investment prospects for the TRACECA corridor, mostly by development banks.
The financial sustainability of the data base is an open question to be addressed by the project.

6.3 Political Environment

No particular factors appear to be present and threatening to the sustainability of the project other than those common to all TACIS activities in the TRACECA region.

7. Environmental Impact

Environmental impacts are an issue for the feasibility studies and will be addressed within the project.

8. Monitoring and Evaluation

Key indicators:
Module A
- Institutional acceptance of a sustainable regional data base
- Local experts being able to present and justify traffic forecasts using the module methodology
- Creation and maintenance of a data base
- Provision of useful output to the other project modules
- Output of utility to concurrent and future TACIS and other donor projects
- Delivery of a re-worked and re-edited Chardzev Bridge feasibility study

Module B
Provision of:
- a clear overview of the maritime potential of the Caspian (supply/demand) in physical and economic terms
- a business plan(s) for new services or a new line
- a clear overview of the legal and regulatory framework for maritime operations in the Caspian

Module C
- Provision of a feasibility study acceptable to support decision making by beneficiaries and IFI

Module D
Clear indication of actions which need to be taken to assure continuity of service of the approach channel
Module E
- provision of detailed traffic forecasts for the transport of crude oil and oil products on the Caspian Sea
- thorough evaluation of the existing infrastructure on the Caspian Sea
- provision of a complete feasibility study for emergency, intermediate and total rehabilitation of oil terminals at Aktau and Dubendi; provvision of equivalent studies for Turkmenbashi