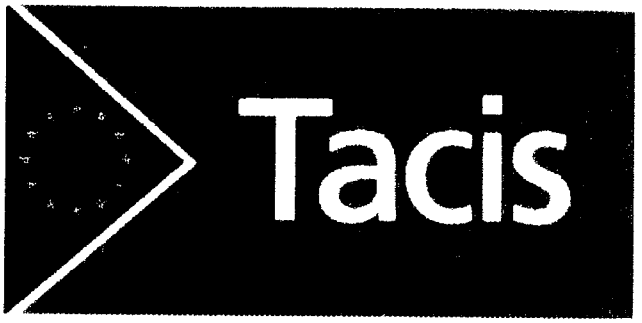

Forwarding - Multi-modal Transports Systems

Final Report

May 1997

FORWARDING-MULTIMODAL TRANSPORT SYSTEMS ON THE TRACECA ROUTE

FINAL REPORT

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1. EXECUTIVE SUMMARY

1.1. Project Background and Context

The overall objectives of this study are to assess the condition of the multimodal transport system, determine priority actions for the design and development of commercially oriented multimodal transport services in the TRACECA Region. This is to be achieved, first by enhancing the capability of various groups of technical and administrative staff, and secondly, through providing assistance and training to intermodal organisations on multimodal business management

The consultant services awarded to an International group of Consultants led by BCEOM, France, comprises the following three phases:

- Phase 1: Identification of the existing problems and recommendations to organise the multimodal transport.
- Phase 2: Transfer of intermodal technologies to a TRACECA intermodal freight transport working group through a study visit in E.U. countries,
- Phase 3: Case studies and training: proposals for future investment to promote and develop commercially attractive and competitive intermodal services from both the economic and technical point of view

The Technical Assistance programme was commissioned in December 1995. The project was started in January 1996.

The initial programme consisted of a survey of the existing technology through specific questionnaires and a series of on-the-spot visits to each of the eight TRACECA countries. These two activities were designed to provide a comprehensive view of the nature of multimodal sector problems and design appropriate strategies and investment projects to develop freight movements by container. In Phase II, in May 1996, a Multimodal Transport Group was set up and in June 1996 this Group participated in a Study Tour of E.U. countries in order to examine intermodal technologies and organisations. A third and final phase included a set of case studies prepared to facilitate the development of Multimodal transport. The practical workshop which followed allowed the team of experts to present the case studies and discuss the proposed strategy with local counterparts.

Additionally, the Multimodal Project Team conducted a specific survey of the cotton market in Uzbekistan to examine the potential for using multimodal techniques in the export of cotton from Uzbekistan. This enabled the project to examine the buyers' attitudes towards the use of multimodal transport technology. The main conclusions and recommendations of the whole Project are set out below.

1.2. Current problems and recommendations

1.2.1. Current problems

The main theoretical requirements for the development of multimodal traffic flows on the TRACECA routes are generally satisfied:

- General goods traffic is expanding.
- Distances are generally well above 1000 km.
- The railway network includes considerable spare capacity.
- A network of transhipment terminals already exists.

	Poti	The container terminal has a platform of 24 000 m² (congested by rail tracks). Only 6 000 m² are available for operating and storing containers (about 560 TEU). The general cargo and grain berth are also congested by rail tracks not embedded into the ground. This restricts the storage capacity to only 16 000 m². Difficult circulation for trucks.
	Batumi	There is only a small container terminal. Limited port storage facilities for general cargo.
Vessel fleet	**Caspian Shipping Company**	The fleet of the Caspian Shipping Company includes: • 20 tankers, of 5 000 Dwt • 5 tankers of 12 000 Dwt • 9 tankers of 5 500/7500 Dwt • 12 dry cargo ships of 3 000 Dwt • 11 dry cargo ships of 4 000 Dwt • 2 RO/RO ships 125 m. long, with a capacity of 365 cars or 84 trucks and 107 cars, or 33 trailers and 105 TEU. • 8 Railroad sea cargo-passenger ferries of 154 m. long Most of the container-carrier ships owned by the company have been chartered and operate out of the Caspian Sea. Only ferries operate on the Caspian Sea. Out of ten, five are hardly damaged, and two could be repaired. Three are serving on the Caspian sea, (three trips a week, each).
	Georgian Shipping Company	The GSC has 44 vessels. One third are reported to be too expensive to operate. They need repair, but are technologically obsolete. Joint ventures with foreign firms are under negotiation to repair 19 vessels.

2.1.3.4. Rail Container Terminal Network

This section describes the present state of the key multimodal installations and equipment.

a) location of container terminals,
b) terminal layout,
c) terminal equipment

a) *Location of the Railway Container Terminals*

The FSU railways operated about 240 container terminals. About 50 of them (excluding terminals for medium sized containers) are located in the TRACECA region (20%). About 20 rail terminals are directly located on the main TRACECA corridor. Besides the railway terminals, some large industrial plants receive containers in their own private sidings.

Most of the railway terminals in the region are concentrated in Kazakstan (about 40%) and in Uzbekistan (about 25%). An under developed network of container terminals has been working in Azerbaidjan, Georgia, Kyrgyzstan and Tadjikistan, consisting of two terminals per country only. The following figures summarise the situation:

Also, vertical handling equipment is insufficient, even for 20 feet containers (especially in the port of Turkmenbashi).

In railway terminals: Transhipment technology, designed to handle small containers is also a handicap (lifting capacity is limited to 20 feet containers)

The predominance of the railway side explains also the slow technological development of the road side. This includes poor provision of road chassis and road trailers for the organisation of the concentration flows by road around the rail terminals.

b) Deficiencies at an operational level

Container transport, mainly subjected to classical railway running regulations, is carried out through the simple addition of separated "mono-modal" services, almost without any intermodal coordination.

Road operations are disconnected from the rail activity. There is no system specifically designed to concentrate/distribute available freight in a given area. Local companies do not have contractual partners to operate at the "other end" of the chain.

As any other type of traffic, container train formation is carried out by a hierarchical three level system of marshalling. The notion of "specialised freight container through train"[3] is not applied. Port and maritime operations are suffering from the lack of special facilities for container traffic. All consignments are on direct delivery basis whereby cargo is loaded straight from vessels onto rail cars for immediate dispatch. This explains the limited storage facilities, and the lack of CFS shed (Container Freight Services) for stacking and unstacking containers. Furthermore, the technique of using ferry-wagons means 35% of the shipload is tare and waste of space (due to no stacking possibilities).

c) Deficiencies at an organisational level

Multimodal provision is also affected by the lack of specialised operators within this type of transport. As a consequence of the choices of the Soviet Era, the current trade participants (sellers, buyers, operators) are not experienced enough in the process of commercialising and organising container transport at an international level. Such operations were carried out by two or three experienced operators based in Moscow. Therefore, there is no real multimodal traffic management structure left.

The lack of entity capable of grouping and coordinating all transport operations required to ship containers on the TRACECA itinerary does not encourage traders to use multimodal techniques. The recent initiative carried out in Uzbekistan to compensate for this deficiency, is quite promising and should be highlighted as a possible model for the future[4].

d) Deficiencies at a commercial level

Current uni-modal operators have a poor perception of marketing techniques. They do not have any elaborate marketing strategy. Customers often have to make their own arrangements to transport their freight to the destination point using their own trucks or a trucking company they selected and paid. The tariffs applied to container traffic are still based on the general railways regulations used in the past. As a result, container transport tariffs are particularly high. The cumulative addition of rates from the various mono-modal services makes a "door-to-door" overall operation rather prohibitive.

[3] Traction between two quite distant terminals, a fixed timetable, no intermediate stopping or sorting, evolving in an integrated transhipment process of a container between one point close to the producer and another point close to the customer.

[4] The enterprise "Shosh-Trans" is in fact the only proper multi-modal organisation currently operating in the TRACECA region.

The particular characteristics of demand related to container usage.

Independent of the deficiencies of providers, commercial operators have real difficulties in satisfying both commercial requirements related to special exchange modalities and the requirements of efficient container transport, namely "door to door" transport[5] and the use of the container in both directions of traffic flow.

In the Europe --> TRACECA direction, the most common commercial practice is a direct relationship between a maker-seller and a final producer. There is no intermediary buyer, or when there is one, he is situated near the final buyer. The first condition of efficiency for container transport is fulfilled ("door to door"). The choice of container therefore seems particularly appropriate.

However, the container must also be useful on the return journey. In the TRACECA -->Europe direction, packing the goods in containers from a place near the sender is not easy, as commercial practice often requires the services of an intermediary selling agent, situated far from the final destination. In this context, the producer-seller knows the content of the agent's order, but not the requirements of the final customer (quality and quantity per type of product, size of parcel, frequency required, etc.). Not being able to anticipate the orders of the final buyers, he must follow transport requirements set out by the intermediary commercial agent. The commercial agent tends to prefer transport solutions by rail wagon for the first phase of transport, as they offer a better loading capacity and therefore a lower cost per ton transported. If the intermediary agent was to receive the load in containers, he would need to unload them in his depot in order to reorganise the goods according to the requirements of the final buyer. This requirement for loading and unloading imposed by commercial practice dissuades operators from using containers in this direction of exchange flow.

This difference in commercial practices certainly has a negative impact on the use of containers, as the condition of making use of the container in both directions is often not satisfied. At the present time only some 10-20% of containers used for import are reutilised for export purposes.

The example of cotton transport provides a good illustration of the current situation. Current methods of commercialisation of cotton[6], combined with mediocre configurations of the means of transport and storage facilities of the seller (designed around the notion of transport of semi-finished products by rail wagon), result in a situation which is not really favourable to the more intensive use of containers[7]. Despite this, it should be emphasised that in 15-20% of cases, the Uzbek seller is aware in advance of the final order and therefore could adapt to the use of containers for the required volumes.

In order to overcome the problem of "empty running" of containers during the return trip, some operators resort to the solution of "last trip container"[8] for sporadic sales or sales of minor importance. For markets of an industrial character, which are more or less permanent and where mainly new containers are used, the question of the return of containers used for imports provides a real headache.

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[5] A proper multi-modal corridor in the TRACECA region involves at least 6 transhipment operations (two on land and four at ports). In the purely transport sense, containers can only be efficient if there is no requirement for supplementary manipulation: the contents of the container does not permit manipulation between one extremity and the other. In terms of commercial agreements, this type of operation implies that the "cost and risks" are transferred from the seller to the buyer at one of the two "doors". As a result, the terms of sale can only be: "free delivered" or "Ex-works". The expression "Ex-works" means that the seller's only responsibility is to make the goods available at his premises. The buyer bears the full cost and risk involved in bringing the goods from there to the desired destination. The term "Free delivered" denotes the other extreme: the seller's maximum obligation. All other types of sale are not well adapted to the circumstances.

[6] See in relation to this subject, the first results of the study "Transportation of Uzbekistan cotton" produced jointly by Scott Wilson Kirkpatrick and BCEOM.

[7] The cotton is actually sold "FOB" (Free-on-board) to intermediate buyers and shipped to the ports in conventional wagons. At a lower unit cost, shipment by wagon is preferred to shipment by container (a train with 50 wagons can carry up to 2,500 tonnes, whilst a train carrying containers cannot carry more than 1,500 tonnes). From the ports, the intermediate buyers resell, after classification, under "free delivered" terms and expedite it by container on a "just-in-time" basis. This enables the buyer to avoid costly stockpiling, but requires on behalf of the seller an efficient and reliable means of transport.

[8] The use of this type of container is considered viable because it reduces the overall cost of imports compared with the use of a new container which is returned empty.

1.2.2. Recommendations

There is unanimous agreement about the need to develop multimodal transport along this commercial itinerary. The political will to bring about the transformation of the existing non-integrated transport system into a modern integrated transport corridor to serve the trade development between the TRACECA States and Europe has been clearly expressed[9].

The necessary redefinition of the multimodal transport system requires not only investment to readapt the existing installations, but also - and of particular importance - modifications to the whole structure. This includes changes to the management methods, from both a technical and commercial point of view, of multimodal traffic and also the regional harmonisation of regulations and transhipment and customs documentation[10].

This process of redefinition can only be carried out efficiently through a strategic approach whereby all the different elements are considered within the context of the system as a whole. It would be a mistake to invest large sums of money in multimodal transport, without ensuring the creation of the necessary conditions for its successful development. It is therefore essential to install an adequate structure for the management of multimodal traffic as well as carrying out the required infrastructure investments.

The implementation of a strategy of simultaneous actions is proposed in two related programmes :

1. A programme of technical assistance to create the basic conditions for the development of the multimodal transport system :

2. A programme of investments for the modernisation of the multimodal transport system (accompanying programme) :

    * Investment projects to re-adapt port container facilities

    * Investment projects to up-grade rail terminal equipment

1.2.2.1. A Technical Assistance Programme

The technical assistance proposed has as its aim the creation of the basic conditions for the development of multimodal transport. The Technical Assistance Programme consists of the two following modules:

- **STEP 1**: Creation of favourable conditions to give rise to at least a minimum level of container traffic,
- **STEP 2**: Creation of a network of multimodal transport companies in the region.

STEP 1: Creation of favourable conditions to give rise to at least a minimum level of container traffic,

The Technical Assistance Programme incorporates the four following tasks:

⇒ **Task 1**: To define the minimum level of traffic necessary to amortise the operating costs,

⇒ **Task 2:** To identify and bring together all the partners involved in multimodal transport,

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[9] A series of initiatives both in Central Asia and the Caucusus ("Regional Agreement on Transport Issues, treaty signed on the 14 May 1996 by Uzbekistan, Azerbaidjan, Georgia and most recently by Kazakstan) as well as at the European level (the TRACECA programme).

[10] The recommendations presented hereafter are based on the needs for the planning of the infrastructure, organisation and management of operations for containerisation and multi-modal transport on the TRACECA itinerary. Actions in the regulatory and customs documentation fields and related to the facilitation of commercial activity form the basis of other complementary TRACECA projects, most notably "Trade Facilitation and Customs Procedures" and "Legal Issues".

⇒ **Task 3:** To produce an "Operational Plan" for Transport, which specifies the role of each participant and defines working procedures,

⇒ **Task 4:** To implement the "Operational Plan" and carry out regular monitoring of progress.

STEP 1 / Task 1: To define the minimum level of traffic necessary to amortise the operating costs.

A study of the market in each country will be carried out in order to fix the objective of the minimum traffic level. This will include specifying the types of products and initial volumes which could be shipped by containers in the TRACECA corridor. At this stage, support from the responsible public authorities is essential as the activation of the TRACECA corridor (a corridor of common collective interest) can only be successful if a minimum level of traffic necessary to amortise operating costs is reached: a volume of 1 000 TEU/country/year[11] would be enough to produce multi-group container trains from Almaty to Poti. This traffic corresponds to a 20 wagon container train, three times a week (that is 120 to 150 containers per week).

STEP 1 / Task 2: To identify and bring together all the partners involved in multimodal transport.

It is essential to create a "High Level Working Party" in each of the interested countries, consisting of representatives of the different groups involved in multimodal transport (Ministry of Transport, railways, road companies, forwarders, shippers and TRACECA experts). The aim of this working party would be to identify the conditions necessary to achieve container traffic volumes of the order of 1 000 TEU per year and to specify the role of each participating partner.

STEP 1 / Task 3: To produce an "Operational Plan" for Transport, which specifies the role of each participant and defines working procedures.

A group of TRACECA experts (both local and foreign) working on behalf of the "High Level Working Party" should prepare an " Operational Plan » for Transport. This plan must specify in detail the method of operation to be applied in order to achieve the threshold level of container traffic along the whole TRACECA multimodal traffic chain. Preparation of this plan will comprise two tasks:

* Sub-task A: A market appraisal
* Sub-task B: A description of the operating methods (Operational Plan)

STEP 1 / Task 3 / Sub-task A: Market Appraisal

In addition to the market study carried out in TRACECA countries (Task 1), it is also necessary to survey the opinions of European buyers in order to better understand the commercial constraints and to adjust the operating methods in order to satisfy the stated desires of the two parties involved. Conducted under the guidance of the "High Level Working Party", a TACIS marketing expert in Europe and a local expert in each TRACECA country should produce within one month a report on the traders' position in this respect.

STEP 1 / Task 3 / Sub-task B: Definition of an Operational Plan

The local and TACIS European experts should prepare, within three months after the market survey, an "Operational Plan" that clearly specifies how the first container shipment should be handled. This plan will include the following items:

[11] This is equal to 50,000 tonnes/year for the five Central Asian countries (or 5,000 TEU/year) corresponding to 30% of the present system capacity (and 6% of the whole potential traffic).

I. organisation of the shipment to and from terminals,

II. definition of the conditions under which the railways make transport rolling stock available,

III. organise the administrative aspects and transport documents,

IV. negotiate tariffs with the Shipping Companies and international railways (tariff, availability of means of transport, choice of routes, documentation..),

V. negotiate the conditions under which empty containers generated by import flows can be used by TRACECA State exporters,

VI. establish co-operation agreements with the owners of containers,

VII. establish a "Specification Manual" for the loading of containers and the certification of goods,

VIII. organise the transfer of responsibility along the entire combined transport chain,

IX. assign a representative from the "High Level Working Party"

X. establish a commercial agreement with European shippers exporting to Central Asia and the Caucasus in order to encourage them to accept the return of containers to Europe loaded with "targeted" products.

STEP 1 / Task 4: To implement the "Operational Plan" and carry out regular monitoring of progress.

Once the "Operational Plan" has been designed and approved by the national working groups, a multi-lateral meeting should be organised in one of the countries of the region in order to establish a regional accord relating to three issues:

I. shipment using a specialised multimodal train via the essential "key" terminals with a fixed train schedule coordinated with the "Trans-Caucasian-Container Train", and further with the Pan-European network (a specific case study has been prepared within this project),

II. the tariff policy to be applied to multimodal transport (a specific case study has been prepared within this project),

III. simplification of the paperwork and procedures (to be based on the "Document Package" proposed by the project "Trade facilitation and Customs procedures").

The first shipments should then be initiated and monitored by the same team of specialists. The problems encountered should be reported to the "High Level Working Party". They must decide, during a second multilateral meeting (if required) how to resolve them.

STEP 2: Creation of a network of multimodal transport companies in the region.

Once the technical and operational conditions are in place, it will be necessary to encourage the signature of partnership agreements between the various participants in order to create, within each country, truly independent multimodal transport companies.

A programme of technical assistance will include the two following tasks:

⇒ Task 1: The creation of multimodal transport companies at national level,

⇒ Task 2: The creation of a regional multimodal transport network connected to the Pan-European network.

STEP 2 / Task 1: The creation of multimodal transport companies at the national level

Specific technical assistance is required to create the multimodal transport companies (statute, organisation, financial management, definition of activities etc.) and in order to assist with the search for potential Western European partners who may be willing to invest in the capital of these enterprises.

STEP 2 / Task 2: The creation of a regional multimodal transport network connected to the Pan-European network.

It is envisaged that a true TRACECA Multimodal Transportation Union should be set up, capable of integrating the inter-modal activities in an international community of interests at the TRACECA corridor level.

The technical assistance programme represents an effort of 17 man-months of expatriate TRACECA experts and 42 man-months of local experts per country involved.

1.2.2.2. Accompanying Investment Programme

The existence of an appropriate operational and institutional framework established thanks to the previous Technical Assistance programme will enable the necessary finances to be obtained and properly managed in order to carry out improvements to the existing physical infrastructure. The programme of investments proposed will be aimed at the modernisation of:

- The existing rail terminal infrastructure,
- The port container facilities and maritime transport.

Upgrading the existing rail terminal infrastructure

These investments are urgent in character, but must be carried out selectively. They are intended to increase the capacity of transhipment of large containers at a target number of terminals located on the main branches of the TRACECA corridor. This will involve investment in reach stackers with spreaders for 40 foot containers (one per terminal), repair of one crane per terminal with folding grapple arm (or simple gear to lift 20 foot containers) and paved surfacing of the storage areas.

These investments must inevitably come from external sources of financial aid because the initial returns will inevitably be modest. The newly-created multimodal transport companies will be unable to provide sufficient levels of investment to finance these improvements during the initial years of operation. However, in the medium to long term, as their activities increase, these companies will increasingly be capable of reinvesting the profits from their activities and should create, on their own, the required supplementary container infrastructure: new terminals, handling equipment, nodal points, etc.

The preliminary evaluation carried out within the framework of the current study has led to the estimation of a short term volume of investments in handling equipment per terminal of the order of $US 0,3 to 0.7 million (The investment volume might be lower for terminals in relatively good condition, e.g. Shumilova, but higher for terminals in poor conditions, e.g. Baku-Khyrdalan). The reconstruction of the « key » terminals, to be considered in the medium-long term, has led to the estimation of a volume of investments of the order of $US 1 million per terminal.

Modernisation of port container facilities and maritime transport

The existing port facilities and maritime transport technologies, designed around rail transportation and horizontal transhipment direct from rail to ferry, explain the lack of handling and storage facilities for container transport.

As the economies of TRACECA countries move closer to the profiles of Western European economies, the predominant wagon-load traffic will decrease, while container traffic will increase. This means that there is an urgent need to create port container facilities in all the ports. The handling equipment and storage areas must be upgraded accordingly.

On the other hand, maritime container transport technologies should be renewed, especially in relation to the Caspian Sea. The ferry-wagons, well adapted to conventional wagon traffic, result in containers being relatively inefficient, both in terms of capacity and in terms of unit costs per ton transported.

However, to shift from a conventional ferry transport system to a container carrier requires significant investment in gantry cranes. At present, this is not urgent as the container traffic is non-existent. To satisfy, at lower cost, the existing traffic demand (dominated by wagon traffic) the renovation of ferry terminals is required. The general renovation of ferry terminals, contemplated within the TRACECA programme[12], integrates the need for creating container facilities. The implementation of the renovation project should allow the revitalisation of container transport. Consequently, In the short-term, container transport using a renovated existing system emerges as the first option.

However, within this renovated system, containerised transport will probably have difficulties in evolving in a satisfactory manner. It is therefore appropriate to examine other alternatives as soon as the first signs of revitalisation appear. To give containerised traffic a better chance of developing in the future, it is recommended that the following alternatives should be considered:

- container transport using a RO/RO ship,
- container transport using a Container-carrier.

The investment required will depend on the transport technique to be used.

The RORO alternative consists of using one of the two RORO vessels belonging to the Caspian Shipping Company (capable of transporting 33 trailers and 105 TEU). This solution has the advantage of being able to accommodate, with containers, the growth of truck traffic (which constitute 40-50% of ferry traffic) while the ferry-wagons are used to accommodate conventional traffic (freight wagon and passengers). This alternative implies (in addition to various restoration works to ground surfaces in order to allow for the circulation of trucks and fork-lift handling vehicles) the construction of a RORO ramp at the port of Turkmenbashi.

The RORO alternative appears to be an interesting solution to accommodate a low container traffic and truck traffic which is increasing rapidly. However, if the intention is to develop an efficient multimodal transport system in the longer term, the use of a container-ship is certainly a much better solution. A container-ship is specially designed for containers and its operating cost is low enough (compared with a RORO vessel) to compensate for the double handling expenses at the inner ports. However, investment to facilitate the vertical transhipment of containers will also be necessary. A preliminary study, carried out within the framework of the present study, has shown that the resulting reduction in operating costs compares favourably with these required investments which include:

⇒ Adaptation of the port facilities at the TRACECA ports concerned, involving:

- re-allocation of some of the available space or creating new storage areas near the ports and equipping the ports with reachstakers and trailers for moving containers to the storage areas and stacking them. (on the Caspian Sea ports, these measures are contemplated within the « Renovation of Ferry Terminals» Project).

- rebuilding of the pavement: part of the rail tracks must be embedded into the ground to facilitate the circulation of trucks and trailers. (on the Caspian Sea ports, these measures are contemplated within the « Renovation of Ferry Terminals» Project).

⇒ Modernisation of the system of vertical transhipment, notably at the port of Turkmenbaschi, and to lesser extent at Baku, where special cranes for lifting 20 foot and 40 foot containers must be provided,

[12] « Renovation of the ferry Terminals of Baku and Turkmenbaschi », a TRACECA project led by the Consultant RAMBOLL.

⇒ Bringing back into use in the Caspian Sea a cargo ship of the type such as the "Buniat Sardarov" or putting into service a RORO vessel. In this case, the RO/RO ramp of the Port of Turkmenbaschi must be renewed.

A detailed cost benefit analysis is necessary in order to verify the economic viability (for containerised traffic) of moving from the existing conventional system to a proper multimodal system. The preliminary evaluation carried out within the framework of the current study has led to the estimation of a volume of investments in the Caspian Sea ports of the order of $US 10 million if the RORO alternative is adopted and $US 15.8 million for the second container-ship alternative. Depending on the alternative adopted and the traffic level, the payback period for the investment is estimated to be about 8 years time. For the Black Sea ports, the payback period on investments for a total amount of a little more than $US 8.7 million(first step) is estimated to be 8 years.

1.3. Case Study and Training

Inter-modal case studies were prepared to provide short-term solutions to facilitate container traffic, to train staff in appropriate technology and medium-term solutions for advanced systems. The different topics were addressed during a practical three-day seminar held in Tashkent on the 15, 16 and 17 January 1997. The seminar also allowed organisations from different countries and from different transport modes to be brought together around the same table to discuss the Multimodal Transport Strategy proposed by the European team of experts.

During a round table, the participants concluded that the seminar's case studies and investment projects, and the presentations of results from other related projects[13] were prepared and conducted at the right level. However, the participants stated their concerns on the financing means to achieve the proposed technical assistance and investment projects.

Unanimously, the possibility to meet each other at the same table during three days was found to be one of the most important aspects of the seminar. The various delegations have had the opportunity to meet individually with Uzbek transport authorities involved in the TRACECA programme as well as with the recently created Multimodal Committee to facilitate Uzbek cotton movement. Furthermore, various delegations were invited to visit the installations of the Uzbek Multimodal company SHOSH-TRANS and mutual cooperation agreements were discussed.

1.4. Transfer of intermodal technologies

The second Phase of the study consisted of a Study Visit in Europe to ensure a real exposure of multimodal groups to the European Unions' practices through a series of visits to selected multimodal sites and organisations.

The Study Visit was carried out during the period 15-27 June 1996. It covered the different means of transport (rail, road and maritime) and facets of multimodal transport as well as technologies and associated logistics-related services in two European countries (Germany and France). Among others, it included meetings and visits to multimodal companies belonging to INTERCONTAINER and the IURR[14], (the two European competing groups) as well as the EUROPEAN INTERMODAL ASSOCIATION. It also comprised the visit to multimodal operators: Maritime operators' facilities (The Hamburger Hafen und Lagerhaus-Atiengesellschaft) and Road companies (Calberson-GE and TAB).

In the opinion of all the participants the objectives of the Study visit matched with TRACECA Countries multimodal needs. All the participants stated their satisfaction with the information received, and the

[13] Presentation of the special "Container pilot train" serving Baku-Poti, prepared by TEWET, and the preliminary results from the project "Uzbek cotton Movement" conducted by Scott-Wilson Kirkpatrick and BCEOM.
[14] International Union of Rail-Road Companies.

opportunity they have had to create good contacts (specially with INTERCONTAINER and NOVATRANS, a IUUR's member) and are ready to develop them. Unanimously, what the participants appreciated most was the organisational aspects related to the multimodal transport system in Europe. They concluded that such a multimodal chain is not only feasible in the TRACECA region, but also essential.

Report structure

The present Draft Final report summarises the results from these three Phases. The structure of this report is as follows:

Section 1: Executive Summary

Section 2: Identification of the existing problems

Section 3: Proposals for Improvements of systems

- Section 3.1: Creation of the basic conditions for the development of multimodal transport
- Section 3.2: Re-adapting port container facilities.
- Section 3.3: Up-grading rail terminal equipment.
- Section 3.4: Development of a terminal network in Kazakstan.
- Section 3.5: Case studies and training.

Section 4: Transfer of technologies

- Section 4.1. The E.U. experience with Multimodal Transport
- Section 4.2. Study Visit in EU Countries by a TRACECA transport group
- Section 4.3. Evaluation of the Study Visit

Annexes: these present detailed information on the various project components.

2. ANALYSIS OF THE CURRENT SITUATION

This section provides a comprehensive view of the multimodal sector problems and summarises the proposed strategy and investment projects to develop freight movement by container on the TRACECA corridor (Phase 1). The information is based on a survey of the existing technology and interviews. The consultant's team travelled along the whole corridor and met with the main organisations involved in each of the eight TRACECA countries.

2.1. The main problems identified

To gather intermodal transport supply and demand data, a Survey of the Multimodal system (Task 3) was conducted through a specific questionnaire shown in Annex 1. The information collected was then completed through a series of visits: in February 1996, in May and during the period July to August 1996. The interviews with relevant counterparts (the list of relevant contacts made is shown in Annex 2), allowed the team of experts to produce the assessment of the existing system (Task 4).

The results from these two activities are summarised here below. The organisation of this part of the study is as follows:

- General multimodal transport environment,
- Traffic flows through the selected TRACECA corridor,
- Technological aspects,
- Operational aspects,
- Management and marketing aspects.

To facilitate the understanding of what the experts have identified to pose a problem, the concept used as reference is, wherever necessary, introduced.

2.1.1. General multimodal transport environment

2.1.1.1. The concept of multimodal transport

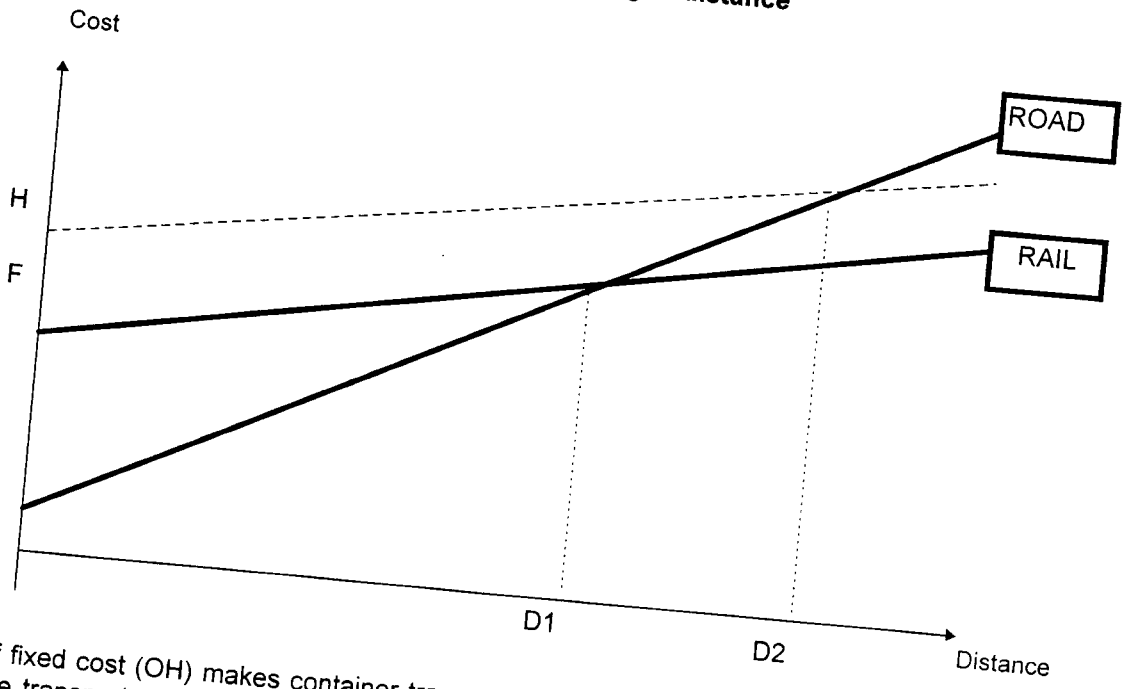
The concept of multimodal transport is here defined as:

> « The organisation of the carriage of goods in one and the same loading unit (container, swap body or semi-trailer) which uses successively several modes of transport without handling of the goods themselves in changing modes. The organisation falls under the control and responsibility of one unique organiser (for example, freight forwarder, etc.) ».

Given the landlocked position of Central Asian countries and the long distances to reach the main trade markets, the multimodal transport technique appears to be a more cost-effective choice, as compared with the dominant mono-modal currently used practices.

The economic advantage results from modal complementarity as shown in the following chart.

Figure 1: Transport costs according to distance



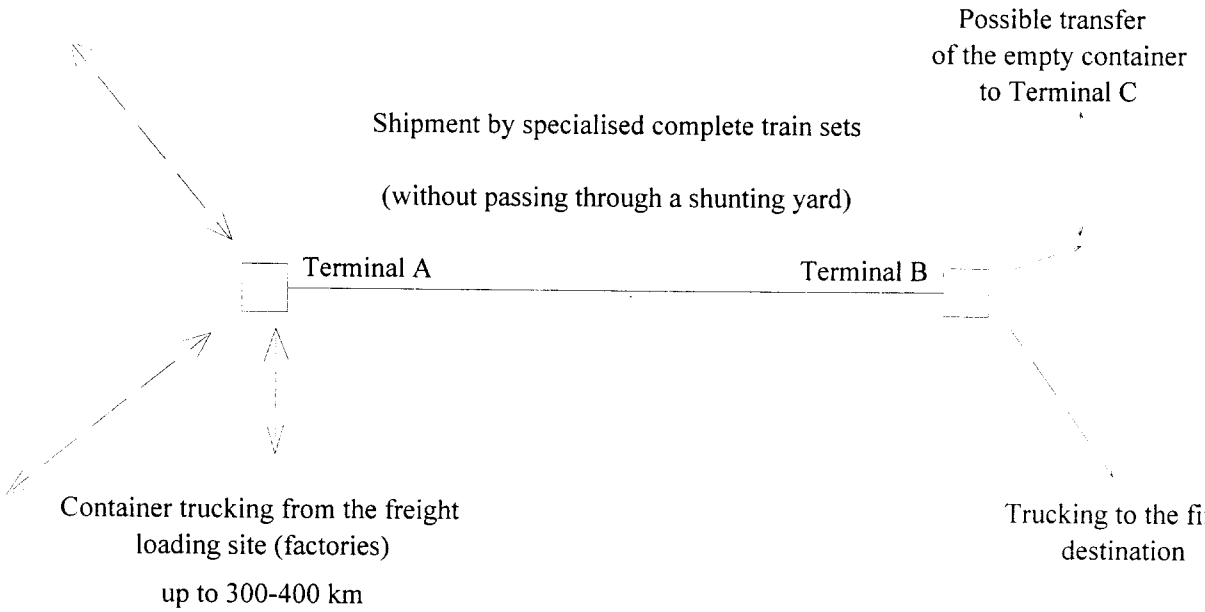
The importance of fixed cost (OH) makes container transport more expensive by rail than by road for short distances since the transport costs by road are largely variable (fuel, tyres, maintenance, driver cost, etc., represent about 70% of the total cost). Not withstanding this, the variable costs of rail transport increase slower than for road transport. As a result, up to a certain distance (D1), road transport is more economic. For longer distances (distance > D1) rail transport has a clear economic advantage. However, multimodal transport requires investment in handling equipment. When taking account of handling costs (FH), this « break-even distance » is longer (D2, approximately equal to 1000 km). To combine within a single chain the advantages from all transport modes, the conditions required are:

- The concentration of container traffic flows by road at a selected reduced number of rail-road terminals (In Europe, a typical « catchment area » is about 150 km²). In the TRACECA region, it is conceivable to collect containers up to 400 km from a main terminal). Road carriers must also be able to operate at the other «end» of the single chain. To achieve this, they must negotiate and establish co-operation agreements with fellow companies.
- A rail traction from terminal to terminal by specialised container freight train (« Block Trains »). These are trains running directly from one terminal to another terminal located quite distant from the origin (more than 500 km in Europe), without marshalling operations and without stops.
- Maritime transport of containers from/to ports requires specific container facilities at the ports (a CFS container freight service, fixed and mobile handling equipment),

The grouping and co-ordination of intermodal transport operations require a specific Management [illegible]isation[15] working for the benefit of all the partners involved. Furthermore, tariffs must be different from those applied to the general railway traffic. Tariffs must be simple, easily applicable, understandable and competitive in comparison with those applied to other single mode transportation organisations or competitive [illegible]. This implies international co-operation agreements between railways companies operating in the [illegible]ridor. The following chart summarises the principles behind the functioning of the multimodal chain:

[15] evaluating the transport needs of individual firms, the independent combined transport company is able to negotiate [illegible]ve tariffs from the Railways Company (they buy rail traction on a basis of the wholesale price). By reselling these services [illegible]dual firms (on a basis of attractive retail prices) they make a profit. The benefits are reinvested to finance the required [illegible]ure (they act precisely as a "freight transport wholesaler". Examples of such organisations are INTERCONTAINER and [illegible]mpanies (International Union of Rail-road Companies), two structures visited during the study tour (more details in

Figure 2: The Multimodal chain



The whole system is based on the notion of modal complementarity. Such a system helps operators to increase their profit margins (by reducing operating costs) while providing cheaper and better services to their customers:

- Shippers benefit from cheaper, faster and better quality transport: the use of containers eliminates the needs for manipulation of goods themselves (only the « boxes » are handled). It improves security (against breakage, theft, etc.) and reliability of transport, which is under the responsibility of a combined transport operator. It makes transportation time shorter, it simplifies commercial, transport and customs procedures and also payment transactions.

- Road carriers can find a solution for the long-distance transport which reduces need for investment in truck fleet, lowers driver costs and can give a better quality service.

- Railways and Shipping Companies benefit from additional freight traffic while optimising the use of the existing infrastructure and fleet (rolling stock and vessels).

2.1.1.2. Organisational environment in TRACECA countries

The observed situation in TRACECA countries is characterised by a poor perception of the notion of complementarity between the various transport modes. The main reasons for this are:

- strong preference for railways which have practically been the only transport mode in use: transport policy, was and still remains focused chiefly on the railways,

- organisation is largely compartmentalised at the economical and political level: poor interaction between transport modes, with a large predominance of railway structures,

- poor development of road transport companies,

- poor adaptation to multimodal transport at the factory premises,

- competition from other traditional or new mono-modal routes.

Currently, each participant (railway, national and international trucking companies etc.) has a specific and mono-modal approach, which excludes any type of collaboration and joining of interests with other partners. Thus, there is no independent combined transport operator able to assume the responsibility of organising international multimodal container traffic from the origin to the final destination.

Railways continue to use the general organisation and procedures (tariffs, liability regulations, container exchange, use of wagons etc.) which were in force for container traffic in the former Soviet Union. The fracturing of rolling stock resources (specialised wagons and container fleet) between the various national railway networks did not facilitate common work. Indeed, container traffic is considered by each railway network as a type of railway traffic used for a specific type of goods. It is never dissociated from railway operations set up for freight traffic. Although the technology used is specific to container traffic, old habits and behaviour inherited from the Soviet era continue to prevail. Specific technical and operational constraints (final collection and delivery by truck, provision of containers, special tariffs for containers, special high speed through trains, simplified documents, procedures and regulations, etc.) are not integrated and accomplished.

As for the trucking sector, whereas its traditional role, largely confined to local distribution by small lorries, is changing, the direction of such changes is not altogether appropriate. Instead of concentrating on the natural short/medium distance market, most of the road hauliers who are generally poorly equipped, are operating individually in particularly long distance markets, without co-operating with railways (for example without sub-contracting agreements to perform the main long distance traction by rail from terminal to terminal).

However, in most TRACECA countries a reorganisation of trucking activities is underway thanks to the efforts of freight forwarders such as «TERMINAL» and «KAZINTERFRAKT» in Kazakstan, «CAUTREX» in Georgia and «BK-INTRANS» in Uzbekistan. They are able to propose international container services. These dynamic private companies are partially filling the gap left by the absence of specialised combined transport companies.

The most remarkable company is SHOHSTRANS (Uzbekistan), a specialised subsidiary company which represents the Uzbek Railways General Management and manages container traffic in a relatively autonomous way. The company was established two years ago by an initiative from the Cabinet of Ministers. The creation of this company was decided by the authorities to reduce the dependence on foreign forwarders of Uzbek international traffic. Nevertheless, SHOHSTRANS mixes the functions of a multimodal transportation operator for the Railways and a forwarding agent. Although the firm's effectiveness is reinforced by this situation, other container traffic operators have doubts regarding the neutrality of the firm. Indeed, even if SHOHSTRANS can take advantage of its railway affiliation, the firm is submitted, as any other container traffic customer, to the rules and regulations regarding multimodal traffic enacted and applied by the Railways.

The multimodal transport business is also restricted by the low number of local shippers using container instead of the traditional transport by rail wagons for their export operations. For theses reasons, local established foreign firms are suffering because they cannot easily make use of unloaded containers used for imports. Most of the containers are either parked or sent back empty.

Although the TRACECA corridor involves various transport modes, the existing system, strongly concentrated on railways technologies, presents a rigidity peculiar to this mode which makes container transport rather inefficient. This is particularly true for the maritime facet of the corridor: transhipment systems and storage functions have been designed for rail-wagons. Such a configuration handicaps the TRACECA corridor as compared with traditional mono-modal competing routes. The North route, a rail link via the Russian Federation, under strong influence of the MPS (Russian railways information system), is quite reliable. For countries such as Kazakstan, and to a lesser extent for Kyrgyzstan, Tadjikistan and even Uzbekistan, this corridor is still the preferred choice. « Pure » road transport is developing significantly in all directions, including with Turkey and Iran and, to a lesser extent, with Pakistan and Afghanistan.

2.1.2. Traffics flows and planning aspects

2.1.2.1. Introduction

For planning purposes it is important to make an inventory and compare the existing infrastructure and equipment with the minimum physical requirements for the practicability of container transport, taking account of traffic flows on the main links. The organisation of this part of the study, as far as traffic is concerned, is as follows:

- Traffic from/to main rail terminals,
- Traffic from/to the Caspian Sea and the Black Sea Ports:
    - * from/to Aktau,
    - * from/to the port of Turkmenbashi,
    - * from/to the port of Baku,
    - * recent trends in container traffic flows between Turkmenbashi and Baku,
    - * from/to the port of Poti,
    - * from/to the port of Batumi
- Container traffic potential

2.1.2.2. Traffics from/to main rail terminals

Available statistics are particularly poor: as rarely dissociated from the railway normal traffic, data on the number of containers handled is unreliable and incomplete. Final destinations are not known or in the best case only up to the « destination frontier ».

The following table summarises the container traffic in terms of loaded and empty containers in the TRACECA rail terminals (detailed traffic figures, terminal by terminal, are attached in Annex 3).

Table 1: Container movement in railways terminals (Year 1995)

COUNTRY	TERMINAL	LOADED			EMPTY		
		Large size (ISO 20-40")	Medium size	Total	Large size (ISO 20-40")	Medium size	Total
ARMENIA	Karmir/Blur	158	0	158	426	6	432
AZERBAIDJAN	Baku	0	400	400	0	166	166
GEORGIA	Total (country)	74	757	831	58	20	78
KAZAKSTAN							
Almatinskaya		4 597	34 098	38 695	1 344	9 317	10 661
Tselinaya		2 859	24 171	27 030	2 648	5 163	7 811
Z.Kazakstanskaya		2 923	13 690	16 613	NA	0	0
	Total (country)	10 379	71 959	82 338	NA	14 480	18 472
KYRGYZSTAN		1 300	7 895	9 195	2 583	842	3 425
TADJIKISTAN	Total (country)	8 421	16 507	24 928	407	940	1 347
TURKMENISTAN		1 789	11 605	13 394	NA	0	0
UZBEKISTAN	Total (country)	6 983	31 640	38 623	NA	0	0
Total Caucasian C.		232	1 157	1 231	484	186	676
Total Central Asia.		28 872	139 606	168 478	NA	16 262	23 244
TOTAL MOVEMENT		29 104	140 763	169 709	NA	16 448	23 920

As the table shows, it is rather hazardous to base a serious analysis on the available data. However, some comments, made exclusively on large containers (20 feet ISO-containers), are as follows:

- In the Caucasian countries, the container traffic from/to rail terminals is reported to be low. Not having any rail terminal in good conditions, Azerbaidjan is serving container traffic by trucks. Similarly, in Georgia and Armenia, traffic is largely served by road transport. Loaded containers represent only 37% of the overall large container movements. This reflects the « unbalanced » character of the traffic which results in low productivity as most of the containers must be sent back empty.

- In Central Asian countries, large containers (95 % are of 20 ISO container type) represent only 17% of the total « loaded » containers, reflecting the predominance of small containers, mainly used in the domestic market. The traffic appear to be unbalanced in all cases, but the reasons differ from one country to another. An in-depth analysis would be necessary to explain this situation (domestic and international traffic are considered together). However, from discussions with large operators, specially in Uzbekistan and Kazakstan, the international traffic is largely unbalanced. This is posing a huge problem to foreign firms established in the country as about 80 % of unloaded containers must be either parked somewhere or sent back empty.

Considering all container types, it is possible to recalculate traffic volumes expressed in TEU. The results, presented in the following table allow the rail terminals to be classified according to the present traffic volumes.

Table 2: Present traffic volumes in TEU/year

Concentration area */from West to East/*	**Terminals**	**Formation in main corridor TRACECA**	**number of containers (TEU)**			
			per year	**per month**	**per week**	**per working day**
Tbilissi / Eastern Georgia	Tbilissi Tov., *Rustavi gruz., Gori Gruz.*	yes	200-300	< 50	< 10	< 5
Armenia	Karmir Blur, Abovyan, Vanadzor, Sevan 2	no	1000-1500	100-150	20-30	5-10
Western Azerbaidjan	Gyandzha	yes	<100	< 50	<10	< 5
Baku / Eastern Azerbaidjan	Baku-Kishly (Khyrdalan)	yes	500-1000	< 50	10-20	< 5
Turkmenbashi	Turkmenbashi, Nebit-Dag	yes	300-500	< 50	< 10	< 5
Ashgabat	Obezberdy Kuliev, *Tedzhen, Kizil-Arvat, Kaakha*	yes	1500-2000	200-300	30-50	5-10
Tchardzhev/Mary	Mayskaya (Mary), Zerger, *Bairam-Ali, Tchardzhev 2, Sejdy, Amudarya*	predominantly	1500-2000	100-150	30-50	5-10
Atyrau	Atyrau	no	500-1000	50-100	10-20	< 5
Aktau/Mangyshlak	Mangyshlak	no	1000-1500	100-150	20-30	5-10
Tashauz/Nukus	Gazatchak, Tashauz (TUR), Nukus, Urgentch, *Kungrad, Khodzhejli* (UZB)	no	1000-1500	50-100	10-20	< 5
Bukhara/Navoi	Bukhara 2, Tintchlik, *Kyzyltepe, Utchkuduk, Yangizerafshan*	predominantly	1000-1500	100-150	20-30	5-10
Samarkand	Ulugbek, Karshi, *Kattakurgan*	partly	2000-3000	150-200	30-50	5-10
Southern Tadjikistan/Termez	Dushanbe 2, *Kurgan-Tyube* (TAD) Termez/*Galaba, Denau* (UZB)	no	> 5000	> 500	> 100	> 20
Fergana Valley	Andizhan Sev., Asaka, Kakir, Margilan, Raustan, *Kokand, Utchkurgan, Namangan* (UZB), Khodzhand, *Kanibadam* (TAD), Osh, *Dzhalal-Abad, Kyzylkiya* (KYR)*t*	no	> 5000	300-500	> 100	> 20

Based on the volume of all container transport (incl. medium-sized) recalculated in TEU

Concentration area	Terminals	Formation in main corridor TRACECA	Number of containers (TEU)			
			per year	per month	per week	per working day
Tashkent	Tashkent-Shumilova, Dzhizak, *Angren, Akhangaran, Syrdarya, Tashkent Tov., Khavast, Tchirtchik, Yangiyul, Bekabad*	predominantly	> 5000	> 500	> 100	**> 20**
Tchimkent/Dzhambul	Tchimkent, Dzhambul, *Arys, Turkestan, Zhanatas, Karatau*	predominantly	3000-5000	200-300	50-100	
Kzyl-Orda	Kzyl-Orda, Tyuratam	no	500-1000	50-100	10-20	< 5
Aktyubinsk	Aktyubinsk	no	2000-3000	200-300	30-50	**5-10**
Uralsk	Zhilayevo	no	500-1000	50-100	10-20	< 5
Tchu	*Tatty, Lugovaya, Kuragaty, Tchu, Sary-Shagan*	predominantly	300-500	< 50	< 10	< 5
Northern Kyrgyzstan	Bishkek-Alamedin, *Rybatchye, Bishkek 1, Karabalta*	no	2000-3000	150-200	30-50	**5-10**
Dzhezkazgan	Dzhezkazgan, *Karazhal*	no	300-500	< 50	< 10	<5
Akmola/Karaganda	Akmola, Karaganda, *Agadyr, Zhana-Arka, Osakarovka, Temirtau, Aksu, Atbasar, Yermentau, Maj-Kuduk*	no	3000-5000	200-300	50-100	**10-20**
Arkalyk	Arkalyk, *Derzhavinskaya, Dzhaksy, Yesil*	no	300-500	< 50	< 10	< 5
Pavlodar/Ekibastus	Pavlodar Yuzhn., Ekibastus, *Pavlodar, Yermak, Yermak Gruz., Shtcherbakty*	no	1000-1500	100-150	20-30	**5-10**
Koktchetav	Koktchetav, *Novoishimskaya, Volodarskoye, Suly, Tajntcha, Makinka, Kzyl-Tu*	no	500-1000	50-100	10-20	< 5
Kustanaj	Kustanaj, *Amankaragaj, Dzhetygara, Mailin*	no	1500-2000	100-150	30-50	5-10
Almaty	Almaty 2, Taldy-Kurgan, *Almaty 1, Sary-Ozek, Ush-Tobe, Otar, Tekeli*	predominantly	> 5000	> 500	> 100	**> 20**
Druzhba	Druzhba (no data for local shipment)	yes				
Semipalatinsk/ Ust-Kamennogorsk	Semipalatinsk, Zashtchita, *Ayaguz, Konetchnaya, Korshunovo, Neverovskaya (Russia), Shemonaikha, Leninogorsk, Serebryanka, Zyryanovsk*	no	2000-3000	150-200	30-50	**5-10**

Comments: Four terminals register a traffic of more than 20 TEU/day (Termez; Fergana; Tashkent and Almaty). For upgrading purposes, they must be considered with the highest possible level of priority . Two terminals (Akmola and Tchimkent) are between 10 and 20 (Level 2). Ten are between 5 and 10 containers/day (Level 3).

As for recent trends, available figures produced by railways companies suggested that container movement in rail terminals is rapidly decreasing.

Table 3: Recent trends in container movements in railways terminals

COUNTRY	Railway Company	LOADED CONTAINERS					
		Large Size			Medium Size		
		1993	1994	1995	1993	1994	1995
Armenia			135	158		14	0
Azerbaidjan					2 451		400
Georgia			466	74		3 505	757
Kazakstan	*Almatinskaya*		7 927	4 597		66 401	34 098
	Tselinaya	8 586	5 206	2 859	58 713	42 986	24 171
	Zapado-Kazakh.	8 760	4 739	2 923	36 135	27 182	13 690
	Total (country)		17 872	10 379		136 569	71 959
Turkmenistan		7 311	4 025	1 789	40 807	24 117	11 605

Rail container traffic in Kazakstan decreased from 9 000 units in 1993 to 3 000 units in 1995 and in Turkmenistan from 7 300 units in 1993 to 1800 units. From discussions with freight forwarders, road container traffic (mainly carried by Iranian and Turkish hauliers) is developing rapidly to the detriment of the railways. The deterioration of the rolling stock and handling equipment at rail-terminals as well as at customer's premises also helps to explain this situation.

2.1.2.3. Traffic from/to the Port of Aktau

Although still low, container traffic from/to Aktau is increasing rapidly. The following table summarises the situation (in thousands tons):

Table 4: Container traffic from/to Aktau

	Export	Import	Total
1993	0	1.1	1.1
1994	2.2	1.0	3.2
1995	3.5	6.6	10.1

During the first 8 months of 1996, the number of loaded containers (for export) represented 1 512 tons (or about 150 TEU) while the empty containers represented 1 183 tons. Virtually all movements of containers are to or from Iran. They contain consumable goods, asbestos, polystyrene and plywood. There are loaded containers on the decks of cargo ships with a maximum of 30 units per trip. This means that not always all containers can be loaded on a particular ship.

In the short-term, only limited volumes of containers from Aktau can be expected to follow the TRACECA corridor. Long distance traffic cannot justify a ferry service between Aktau and Baku. However, trade between

Azerbaidjan and Kazakstan (petroleum products from Azerbaidjan, cereals from Kazakstan) may be sufficient to justify it.

The oil Industry may be interested in transporting cargo from Europe and USA through the Black Sea. An oil company visited during in-site visit last August stated that they are currently bringing 20-25 containers/year from the US through St Petersburg Port and further south by railways. The interviewed company is not satisfied with present transport conditions. A difficulty they face is the absence of forwarders. Several companies expressed interest in setting up an office in Aktau - including SAGA of France - but it has not been done yet. On the other hand, some spare parts or drilling equipment are coming from Frankfurt by air with transhipment in Baku.

2.1.2.4. Traffic from/to the Port of Turkmenbashi.

The following table summarises the general traffic trend (including the two existing terminals), since 1987, expressed in thousand tons.

Table 5: Container traffic from/to Turkmenbaschi

	1987	1991	1992	1993	1994	1995
Via Ferries terminal	5 803	2 061	1 247	855	698	782
Via Piers	2 132	2 032	991	388	214	263
Total (oil excluded)	7 835	4 093	2 238	1 243	912	1 045

In general, the traffic has decreased dramatically, from almost eight million tons in 1987 to only one million in 1995. Detailed 1995 traffic figures provided by the port of Turkmenbaschi (in tons) are as follows:

Table 6: Detailed traffic figures (Port of Turkmenbaschi in 1995)

Nature of the Traffic	incoming	out-going	Main destinations
VIA PIERS			
Building materials	42 000	42 000	to Baku and other ports
Salt	79 000		from Bekdash (46 000 are sent to Turkmenistan by train)
		33 000	to Baku
Cotton		12 000	to Baku for Azeri. textile factories
Metal products		10 000	export
Chemicals/fertilisers		10 000	
Flour	4 000		imported via Baku
Equipment and others	27 000		from Iran
Full containerised (in 20 TEU)	4 000		about 400 TEU
TOTAL via piers in tons	156 000	107 000	TOTAL in and out = 263 000 T.
VIA FERRY TERMINAL			
Total volume from BAKU	314 000		
Total volume to BAKU		468 000	
Num. rail cars from BAKU	4 133		
Num. rail cars to BAKU		5 663	
TOTAL via ferry services in tons	**314 000**	**481 000**	equal to 782 000 Tons
TOTAL OF RAIL CARS	**4133**	**5 663**	equal to 9 799 units

Comments:

- Apart from 47 000 tons of salt[16] and 27 000 tons of equipment from Iran, the traffic of this port is connected with Baku (about 90 %). Via piers, commodities such as equipment, cotton, fertiliser and part of the metal products (ingots) are containerisable. However, only 4 000 tons are fully containerised traffic (about 400 TEU in 1995).

- The traffic via the ferry terminal is more than three times higher than the traffic via piers. Two ferries, three times a week (12 round trips/week) are serving this connection. The number of trucks and rail cars are reported. Trucks represent on average 50% of the loads embarked onto the ferries. (10 000 rail cars made up the rest). Some of them are carrying containers.

2.1.2.5. Traffic from/to the Port of Baku

The following figures provided by the Caspian Shipping Company summarise the structure and trends of the traffic registered in 1989 and 1995, expressed in thousand tons/year:

Table 7: Structure of the traffic reported in Baku

	1989	1995	1995 (in %)
TOTAL LIQUID BULK CARGO	**7 753**	**797**	**47.1 %**
Crude oil inbound	3 076	66	3.9 %
Oil products outbound	4 247	164	9.7 %
Oil products inbound	0	300	17.7 %
Fresh water outbound	430	267	15.8 %
TOTAL DRY BULK CARGO	**493**	**112**	**6.6 %**
Building material inbound	398	7	0.4 %
Salt inbound	95	105	6.2 %
TOTAL FERRIES (tares included)	**4 126**	**782**	**46.3 %**
Baku to Turkmenbashi	1 995	314	18.7 %
Turkmenbashi to Baku	1 722	468	27.6 %
Baku to Bektash	0	0	0 %
Bektash to Baku	392	0	0 %
Baku / Aktau round-trip	17	0	0 %
TOTAL ALL KINDS INCLUDED	**12 372**	**1 691**	**100.0 %**
of which ferry terminal	**4 126**	**782**	**46.3 %**

Comments:

- The total cargo loaded and unloaded via all the berths declined from 12.4 million tons in 1989 to 1.7 million tons in 1995. As a result, the port infrastructure is under used. The decline has been more pronounced for bulk traffic than for general cargo.

- At present, liquid bulk cargo and ferry traffic are the two main activities of the port.

[16] salt represents 50 % of the incoming traffic, via piers. It comes from the small port of Bekdash.

- Ferry traffic representing 30 % in 1989 is now amounting to nearly 50 % of the total throughput. Container traffic, via ferry terminals, is reported to represent only about 300 TEU.

2.1.2.6. Recent traffic flows trends between the ports of Turkmenbashi and Baku

The following two tables produced by the Caspian Shipping Company summarise the nature of the traffic flows and trends, in both directions, between these two ports for the period 1993-1995 (in thousand tons/year):

Table 8: Recent traffic trends Baku-Turkmenbaschi

	1993	1994	1995
BAKU - TURKMENBASHI			
Perishable foodstuffs	1.3	8.8	0.8
Frozen food		8.6	15.5
Beverages	12.1	11.0	7.9
Textile	67.0	2.9	5.9
Ore	4.4.	23.	25.4
Raw materials/ Building materials	9.3	5.1	7.9
Chemicals		9.4	10.6
Oil products	5.8	9.6	9.5
Equipment / vehicles/metal products	11.2	57.9	132.1
Other	22.7	18.2	19.2
Tares of rail cars	74.2	86.5	79.2
TOTAL WITH TARES	208.0	241.0	314.0
TOTAL WITHOUT TARES	133.8	154.5	234.8
TURKMENBASHI - BAKU			
Grain	23.6	34.5	39.4
Salt		4.4	7.3
Sugar	1.8	11.5	14.5
Perishable foodstuffs	2.9	8.8	5.8
Frozen food	0.8	5.3	2.8
Beverages...	0.3	1.9	3.6
Raw textile / Cotton	0.3	1.0	2.0
Cement	16.4	11.4	83.5
Raw materials/ Building Materials	30.3	7.8	32.8
Timber		.5	1.3
Chemicals	13.4	4.0	27.3
Oil products	46.4	60.6	6.2
Metal products	5.6	9.8	11.5
Equipment / vehicles/metal products	77.8	50.9	106.5
Paper / Cellulose		0.6	0.9
Other	18.6	4.2	13.5
Tares of rail cars	81.0	92.4	109.1
TOTAL WITH TARES	319.2	309.6	468.0
TOTAL WITHOUT TARES	238.2	217.0	358.9

Comments:

- The traffic is unbalanced: traffic from Turmenbaschi to Baku is one third higher than the traffic in the opposite direction. As a result, the net rate of loading is quite low. The dead-weight of rail cars in the total throughput is particularly high: the ferries are carrying about 35 % of dead-weight.

- The traffic from Baku to Turkmenbaschi is increasing faster than the traffic in the opposite direction. From 1993 to 1995, the total traffic from Baku to Turmenbaschi (without tares) doubled. This is mainly due to the spectacular growth of equipment/vehicles/metal products, specially in the direction Baku -->Turmenbaschi (multiplied by 12). As rail tare is almost stable, there is reason to believe that the largest part of the traffic increase (100.000 tons) is passing by trucks (via ferry terminals). It seems that road traffic is filling the gap left by the disorganisation of the railways and the absence of combined transport organisation.

- To a lesser extent, perishable goods traffic, such as fruit and vegetables (available from June to September) is also increasing rapidly. In 1995, foodstuffs and beverages, textile products and equipment represented about 53 000 tons in Eastbound (22 %) and 28 000 tons westbound (8%). If fertilisers are added (most of fertilisers are prepacked in bags), the volume of containerisable traffic increase to 63.000 tons east bound (about 6 300 TEU).

- Although the nature of the traffic is evolving towards easier containerisation, the use of this technique remains minor: less than 1% of the total traffic is containerised (about 350 TEU).

2.1.2.7. Traffics from/to the Port of Poti

The following two tables summarise the traffic movements from/to the Georgian port of Poti in 1995, expressed in thousand tons/year.

Table 9: Traffic movement from/to Poti

Commodities	Thousands Tons.	%	Countries Origin/Destination
Total IMPORT	1 388	100	
Bulk	**697**	**50 %**	
Coal	4		
grain	641		Georgia
ore	2		Georgia
bauxite	50		Azerbaidjan
Oil	**476**	**34 %**	**Georgia / Armenia**
General cargo	**137**	**10 %**	
Flour/Foodstuff, sugar	115		Georgia / Armenia
Meat	5		Azerbaidjan
Equipment	9		Georgia/Armenia/Azerbaidjan
Other break bulk	9		
Containers (1000 t.)	**78**	**6 %**	**Georgia / Armenia / Azerbaidjan**
N° of units	**(5 999)**		
Total EXPORT	**389**	**100 %**	
Bulk	**145**	**37 %**	
Manganese ore	43		Georgia
Copper concentrate	46		Armenia
Scrap iron	36		Georgia
Other	20		
Oil	**146**	**37 %**	**Azerbaidjan**
General Cargo	**81**	**22 %**	
Metal products	48		Georgia / Azerbaidjan
Timber	1		Georgia
Fertilisers / chemicals	23		Georgia / Azerbaidjan
Equipment	5		
Other	4		
Containers (tonnage)	**17**	**4 %**	**Georgia/Armenia/Azerbaidjan**
N° of units	**(3 296)**		
GENERAL TOTAL	**1 777**	**60 %**	**Georgia** (containers excluded)
		22 %	**Armenia** (containers excluded)
		18 %	**Azerbaidjan** (containers excluded)

Main comments from this table are as follows:

- As other ports in the former Soviet Union ports, traffic in Poti has declined dramatically: from 4.5 million tons in 1989 to 1.1 million in 1992. Nevertheless, from 1993 to 1995, the traffic increased to 1.6 million tons. This is mainly due to food products generated by the World Food Programme and to the recent the oil equipment traffic connected with oil industry. Part of the World Food Program traffic has been forwarded to Kyrgyzstan, Tadjikistan (about 15% of this food traffic).

  Although Poti still remains a port for Oil and Dry bulk, its traffic is diversified. It must be emphasise that rapid containerisation process in progress: imports and export containers increased from 23 000 tons in 1992 to about 90 000 tons in 1995 (9 000 TEU).

- With 50% of the container traffic passing through the port, Armenia is the biggest user of container followed by Georgia (30%) and Azerbaidjan (20%). The traffic is largely unbalanced. Most of the containers must be sent back empty.

- Other general cargo traffic consisting of pipes, metal products, or homogeneous cargo in bags are not containerisable. Containers excluded, the Georgian trade generates 60% of the traffic, Armenia 22% and Azerbaidjan 18%.

- Container movement from/to Central Asia is included in the 20% of container traffic registered with Azerbaidjan. According to discussions with some forwarders, container traffic from Central Asia represents only about 3% of the container traffic of Poti (270 TEU). It is mainly a question of food products forwarded by the World Food Programme.

- There is significant traffic of RO/RO vessels carrying cars and trucks from/to Bulgaria.

2.1.2.8. Traffic from/to the Port of Batumi.

The following table summarises the traffic movements from/to the Georgian port of Batumi in 1995, expressed in thousand tons/year.

Table 10: Traffic movement from/to Batumi

Nature of the traffic	1 000 ton	%	Origin/Destination
IMPORT. TOTAL	894	100 %	
Bulk	**533**	**60 %**	
Coal	4		
grain	529		
Oil	**238**	**27 %**	**Georgia / Armenia**
General cargo	**122**	**13 %**	
flour/Foodstuff, sugar	115		Georgia / Armenia
equipment	1		
other break bulk	6		Georgia/Armenia/Azerbaidjan
Containers	**0**	**0 %**	
EXPORT. TOTAL	490	100 %	
Bulk	**18**	**4 %**	
Manganese ore	18		Georgia
Oil	**404**	**82 %**	**Azerbaidjan**
General Cargo	**68**	**14 %**	
metal products	46		Georgia
foodstuff	20		Georgia
other	2		
Containers	**0**	**0 %**	
GENERAL TOTAL	1 384		

Main comments from this table are as follows:

- The traffic has declined from 3 million tons in 1990 to 1.4 million in 1995. Currently, the traffic level is almost the same as at Poti. However, being found more convenient, Poti is expected to play a greater role in export/import operations, specially for general cargo.

- The port of Batumi does not have container or RO/RO traffic. The existing traffic is mainly composed of bulk trade (oil and grain) which constitute 84% of the total throughput (grain amounted 529 000 tons and oil to 238 000 tons). As for general cargo, this is only 190 000 tons, essentially food products from the World Food Programme (flour, rice, sugar and foodstuff).

- There are about 10 000 tons of Uzbek cotton shipped by rail and stored in the sheds of the port. It is said to be a traditional practice of Uzbek traders. To store the cotton at port sheds and commercialise it from there (15 000 tons in Le Havre; 15 000 tons in Bremen, 15 000 tons in Trieste and the Baltic ports etc.).

- The road network around the Batumi port is in poor condition, with a very tortuous alignment including grades up to 20%. Consequently, articulated trucks experience difficulties in reaching the port. This explains the greater use of the railway and is somehow, the traders' preferences for Poti.

2.1.2.9. Potential for Intermodal Transport

It is very important for railway companies as well as for road carriers to forecast container movements so that they can plan investment and adapt their capacity to demand. On the other hand, it is very difficult to make such forecasts with accuracy because container use much depend on tariffs and the quality of service offered to transport users.

In TRACECA countries, the proportion of goods transported by container is presently very low. Traffic figures produced by the TRACECA project « Trans-Caucasian Pilot Train » shows that the current volume is 92 TEU/week on the Poti-Baku line. Only 2 TEU/week are from/to Central Asia. The same study produced container traffic forecasts. By substituting the road transport container movement on this line (120 TEU/month) and taking account of the growth potential, the container traffic would reach 261 TEU/week by the end of 1997. These developments mean that container movements could experience rapid growth in the coming years. By the year 2015, according to the same project, the transit traffic would represent a volume of about 700 000 tons (equivalent to 70, 000 TEU/year).

Within the present Multimodal project, the potential for containerised traffic has been estimated. A good indicator of the potential for growth is the number of containers which would be utilised if containerisation rates were to come close to those observed in international trade between industrialised countries.

Such an indicator of potential for container movements was calculated using available figures for the year 1995. The result of the calculation is interesting as it shows that present container traffic represents only a small proportion of the potential traffic. In other words, even if interzonal or international trade did not grow, transport by container could still develop considerably.

APPROACH TO DETERMINATION OF CONTAINER POTENTIAL

Since the TRACECA Multimodal Transport Project is essentially concerned with international traffic, the calculation of container potential was based on foreign trade statistics in volume as collected under the TRACECA Regional Traffic Forecasting Model Project. The calculation was done in six steps as indicated below.

TRACECA countries were divided into three groups:

i. "Caucasian Region" including Armenia, Azerbaidjan and Georgia;

ii. "Mid-Asian Region" including Kyrgyzstan, Tadjikistan, Turkmenistan and Uzbekistan; and

iii. Kazakstan considered separately as transport routed via the north of the country can be substantially different from routes for other Central Asian countries.

In the first five steps, calculation was done separately for the three groups.

Step 1 - Group countries and commodities according to the probability of using containers in transport of those commodities to/from those countries.

The result was six commodity groups and fourteen country groups including the three groups of TRACECA countries. Commodity groups are shown in Chart A and country groups in Chart B **(See Annex 10).**

Step 2 - For each element of commodity / country matrices, calculate export and import volumes.

This was done by aggregation of the 21 commodity groups / 27 country group matrices obtained from the Regional Traffic Forecasting Model Project. The figures are for year 1996 for Georgia and Uzbekistan and for 1995 for all other TRACECA countries. Aggregated matrices M_1 are given as Tables 1a, 1b and 1c for each of the three TRACECA groups Caucasian Region, Mid-Asian Region and Kazakstan **(see Annex 10).**

It is worth noting that for the Mid-Asian Region some 80% of the exports in Commodity Group 6 are cotton or wool.

Step 3 - For each element of the commodity / country matrix, determine the proportion of goods which may be transported by container.

Estimated matrices M_2 are given as Tables 2a, 2b and 2c for each TRACECA group (see Annex 10). It was assumed that for goods which are prone to be carried in containers such as those of Group 2 (foodstuffs) or Group 6 (textile- manufactured products), containerisation rates for transport over very long distance (America, Japan) would be similar to those observed in high-income countries, i.e. up to 90%. In trade with Europe the rate would be somewhat lower since door to door trucking is feasible. As for exchange between neighbouring countries such as between Central Asia and Caucasian countries, it was assumed that the potential rates were rather low.

Step 4 - Multiply each element of matrices M_1 by respective element of matrices M_2.

This gives the number of tons transported by container by commodity group and by origin (import) or destination (export). Dividing by the assumed container weight for each commodity group and summing all commodity groups results in matrices M_3 which gives the number of containers imported or exported by country group.

Assumed container weights for 20 ft containers were from 11 tons for textiles to 16 tons for metal.

Step 5 - For each country group, determine which percentage of the containers will take a specific corridor.

The resulting matrices P_1 are given in Table 3 for each of the three TRACECA regions.

The corridors correspond approximately to the following routes:

- North-Western Corridor: from Central Asia to Moscow and then to Finland and other Scandinavian countries or to Poland and Baltic Sea through Brest.
- Central-Western Corridor: from TRACECA countries to Central and Western Europe through European Russia or Ukraine.
- Southern Corridor: to Persian Gulf through Iran or to Indian Sub-continent and Indian Ocean through Kashgar or possibly Afghanistan.
- Eastern Corridor: from Central Asia to East Asia through Sino-Kazak border crossings, particularly Druzhba station, or through Siberia and Far-East ports.

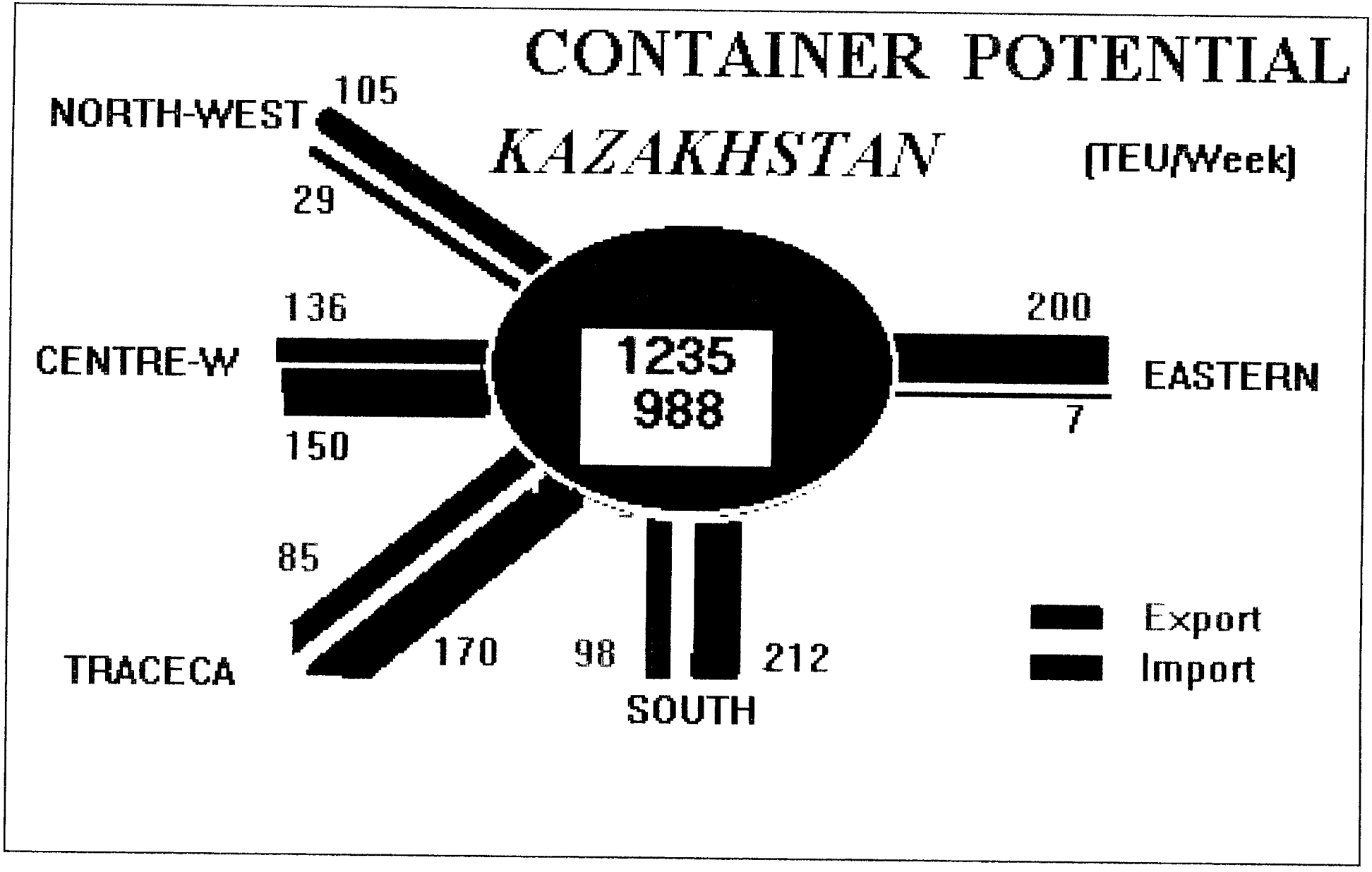
- TRACECA corridor considered at two locations: Caspian Sea crossing and Georgian ports on the Black Sea (Poti and Batumi).

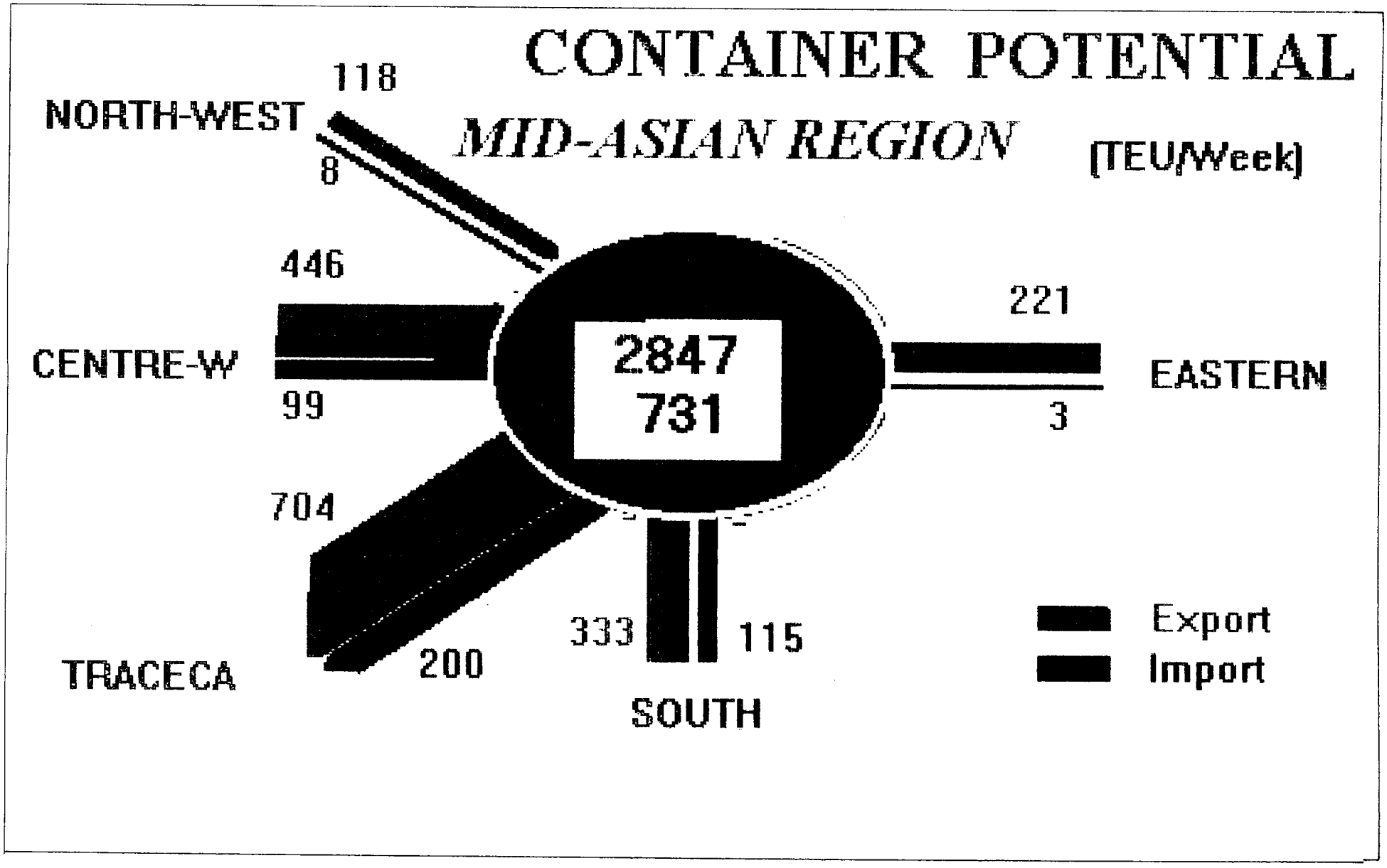
Step 6 - Multiply each element of matrix M_3 by the corresponding element of matrix P_1.

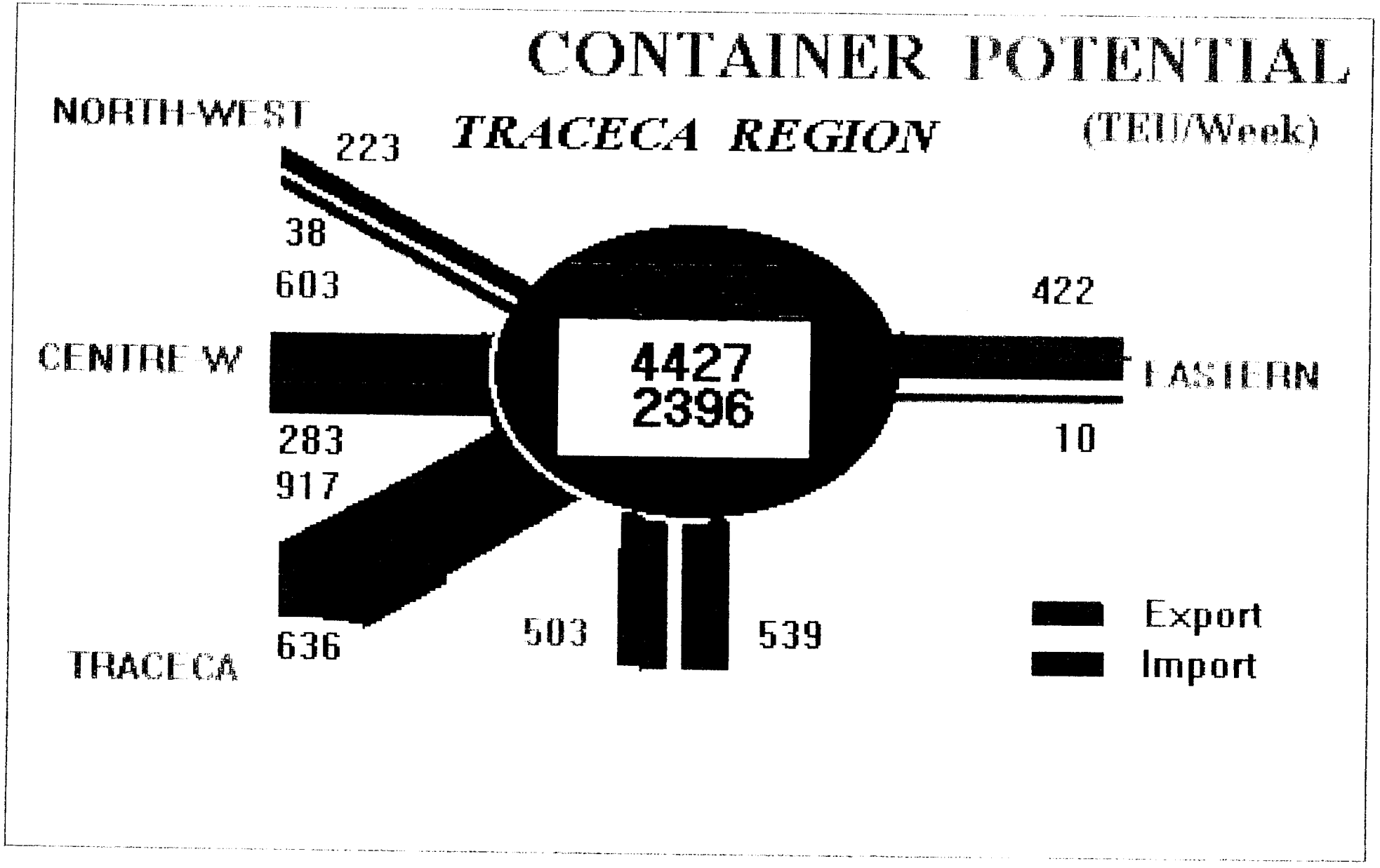
The result represents a potential container traffic on each corridor

RESULTS OF THE CALCULATION

Potential container traffic are given in Table 4 (see Annex 10) by corridor and by direction expressed in both TEU/year and TEU/week. They are represented in graphic form on the diagrams shown below:


CONTAINER POTENTIAL
KAZAKHSTAN
(TEU/Week)
NORTH-WEST
105
29
136
CENTRE-W
150
1235
988
200
EASTERN
7
85
TRACECA
170
98
212
SOUTH
Export
Import


CONTAINER POTENTIAL
MID-ASIAN REGION
(TEU/Week)
NORTH-WEST
118
8
CENTRE-W
446
99
EASTERN
221
3
2847
731
TRACECA
704
200
SOUTH
333
115
Export
Import


CONTAINER POTENTIAL
TRACECA REGION
(TEU/Week)
NORTH-WEST
223
38
603
CENTRE W
283
917
TRACECA
636
4427
2396
503
539
422
EASTERN
10
Export
Import

From the diagrams, the potential for development of transport by container seems very high since present volumes represent less than 10% of the computed potential volumes. The diagrams show that traffic will be unbalanced. If containerisation develops as could be expected, particularly for the transport of textile fibres, potentially more containers could be used for export than for import. Detailed results by region are presented in the section 5.4. Case studies.

In that sense, the « Regional Agreement on Transport Issues » (Uzbekistan, Turkmenistan, Azerbaidjan and Georgia) is an essential event which should boost the traffic from Central Asia to Georgia. The Government of Uzbekistan decided to ship part of the cotton exports to Europe through the TRACECA corridor: 10 000 tons in 1996, 30 000 tons in 1997 and 100 000 by the year 2000. More recently, the Uzbek authorities decided to increase these volumes and sent an important part of 30 000 tons of cotton by containers (3 000 TEU/year). TRACECA Project Managers were requested to incorporate active assistance to facilitate cotton movement by containers. The Inception study given in Annex 9 has been produced by the multimodal team and a specific project was started in November 1996.

Preliminary results from the TRACECA project « Uzbek Cotton Movement » show that existing trade and transport conditions must be improved before the introduction of new container techniques. Indeed, if cotton is containerised in Uzbekistan, it will be moved on a door-to-door basis. It means that the terms of sales must change from the current FOB (Free-on-Board) to a « Free-delivered » or « Ex-works ». Further investigations on the different terms of sale options adapted to container movements should be evaluated before introducing door-to-door container movements. On the other hand, there is a problem of credibility concerning Poti which will need to be addressed. Indeed, cotton merchants do not consider Poti to be an attractive port of shipment. According to them, storage facilities in Poti are still inadequate to cope with this additional cotton traffic.

Furthermore, the rehabilitation of the oil industry in Azerbaidjan has resulted in additional import containerised traffic and will soon contribute to increase container traffic between Poti and Baku.

2.1.3. Technological aspects

2.1.3.1. Introduction

A well-organised multimodal transport system based on a well-developed system of forwarding business did not exist in all countries of the Former Soviet Union (FSU) in the past. The only common kind of multimodal transport was the transportation of universal 20' Containers. The domestic container traffic was a strictly railway-based system. There were no forwarders involved in the organisation of this traffic. Additionally, there exist systems for carrying so-called medium-sized domestic containers and small-sized containers. Other kinds of combined traffic besides container traffic (transportation of trailers, swap bodies or lorries, etc.) are not used at all.

The railway-based container traffic can be understood as a kind of multimodal traffic, because there were involved railways, road traffic, inland navigation and maritime transport. In contrast to European practices, these traffic chains were not organised by forwarders, but had to be organised by the clients themselves with the assistance of the railways, the local road company, the shipping company, etc. International traffic was organised by Soviet monopoly forwarders. The Soviet railways operated common rolling stock and containers. Additionally, there was a container pool, including the 20' containers of all important container owners in the FSU (Railways, Ministry of Maritime Transport and some others).

In former Soviet times the part of container traffic in the total traffic volume amounted only to about 0.5 % (including medium-sized containers to about 1.0 - 1.5 %). In comparison with this, the proportion of the container traffic on the German Railways amounts to about 4-5% (including other kinds of combined traffic to about 8-9 %[17]). In general 10-15 % of the FSU railway container traffic was international traffic (export, import, transit). Thus, the main task of the container traffic system was to carry containers inside the territory of the FSU.

[17] figures for 1993/1994

With the splitting-up of the FSU 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 transformations, 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 KAZAKSTAN railway system already existed in the form of three separate railway districts. The former Transcaucasian Railways were also split into new national railways of Armenia, Azerbaidjan and Georgia.

The splitting-up of the unified FSU railway system and the creation of new independent railways or reorganisation of existing railway structures (KAZAKSTAN) profoundly distorted the organisation of railway transport and the execution of railway maintenance, repair and replacement activities for all railway assets in the TRACECA states. This also applies to the organisation and the equipment for container traffic.

The traditional economic, trade and traffic relations between the republics, regions, customers, etc. have also broken down because of splitting up of the FSU. Due to this, as well as to the general economic crisis in most of the TRACECA countries and the beginning of competition with direct road traffic, the domestic (real domestic and inner-CIS) container traffic has de facto fully collapsed. For example:

- the daily departure of loaded 20' containers in domestic traffic of all three Kazak railways together amounts only to 20-30 containers,

- the total daily departure of loaded containers in Kyrgyzstan amounts on average only to 2-3 containers,

- the average daily departure of loaded containers in July 1996 in Uzbekistan amounted only to 8 containers (on arrival 37 containers)

It is necessary to comment that in general, genuine domestic combined traffic does not have a real future because of the short distances in most of the TRACECA-countries (with the exception of Kazakstan). The international experience shows that the efficiency of combined traffic begins only with a limit of distances of 500 km and more. The extremely low operation costs of road traffic in all CIS-states and Georgia do not allow efficient combined traffic under this distance limit. Moreover, because of the existing freight tariffs, the break-even point in international container traffic amounts to a distance of 1500 km.

The organisation of this section dedicated to the technological aspects are centred around the following broad headings:

- rail and road multimodal infrastructure,
- ports infrastructure and equipment for containers,
- container terminal network:
    - * location of container terminals,
    - * terminal layout,
    - * terminal equipment
- road fleet and rolling stock dedicated to container traffic,
- container fleet and palletisation,

2.1.3.2. Rail and Road Multimodal Infrastructure

The railway network in all TRACECA-countries is a broad gauge network (Russian gauge with 1520 mm). Thus, normal gauge wagons (1420 mm) can't be used and the freight has to be unloaded at interface points (such as Brest, Druzhba, Sarakhs). In case of urgent need, it is necessary to change the bogies of the wagons or the space between the wheels in the wheelsets (this is needed for special wagons).

The types of permanent way on CIS-railways are heavier than on the UIC-Railways. Thus, the maximum load per axle for trunk lines is defined as 23 - 24.5 t (most of the railways visited defined the maximum load as 23 t). The track layout and the gradients used on the main lines cause no special problems for the practice of multimodal transport. However, it must be noted that the Georgian section Sestafoni - Khashuri has a particularly high gradient: 32% between the stations Kharagouli and Likhi. On this section, an assisting « pusher » locomotive is often needed.

In general, the maximum train weights amount to about 3 000 - 3 500 t with some exceptions (e.g. between Sestafoni and Khashuri 2 500 t). The maximum train length is 850 m (on some sections 1 050 m). Thus, there is no major problem to organise special multimodal trains as container trains are normally shorter and lighter than normal heavy freight trains (container special train capacity is usually 20 wagons and 60 TEU).

The lines are mainly constructed under the Soviet clearance "S" which was fixed by former Soviet standard GOST 9238-59. This clearance is valid for all new and reconstructed line sections and railway buildings of the public railway network, including siding tracks between the connecting station and the border of the territory of the owner of the siding track.

For existing lines, built before the coming into force of this standard, slight departures are possible. According to information from the railway administrations visited, there do not exist bottlenecks or problems for train operation of multimodal trains on main lines caused by the clearance.

In general, the permanent way is or was of a comparatively high standard (automatic or semi-automatic block systems on trunk lines, high share of all-electric interlocking, heavy types of rails, long sections welded without gaps etc.). However, the state of the permanent way has been obviously and rapidly worsening within the last few years, because of political instability or military conflicts (Azerbaidjan, Georgia, Tadjikistan), the overall lack of funds, as well as lack of spare parts and railway equipment (rails, sleepers, switches, rail fastening etc.). Very major problems in this respect have been met in Azerbaidjan and Georgia.

The most important problem on all railway networks is the poor condition of the track which was rapidly worsed in the last few years. Thus, the average service speeds are very low:

- Azerbaidjan 35 - 40 kph
- Georgia 20 - 30 kph
- Kazakstan 35 - 40 kph
- Kyrgyzstan 35 - 40 kph
- Turkmenistan: 40 - 45 kph
- Uzbekistan 40 - 45 kph

The maximal possible speed on the line amounts to 80 kph only (only some sections especially in Uzbekistan with 90 or 100 kph). Some thousand kilometres have permanent speed limits resulting from non-performance of necessary track maintenance works.

Because of the significant decrease in freight traffic volumes and therefore the number of freight lines, the railway administrations do not now expect such problems in the medium term (with the exception of some small sections).

The characteristics of the main TRACECA corridor can be summarised as follows.

Table 11: Characteristics of the Main TRACECA corridor

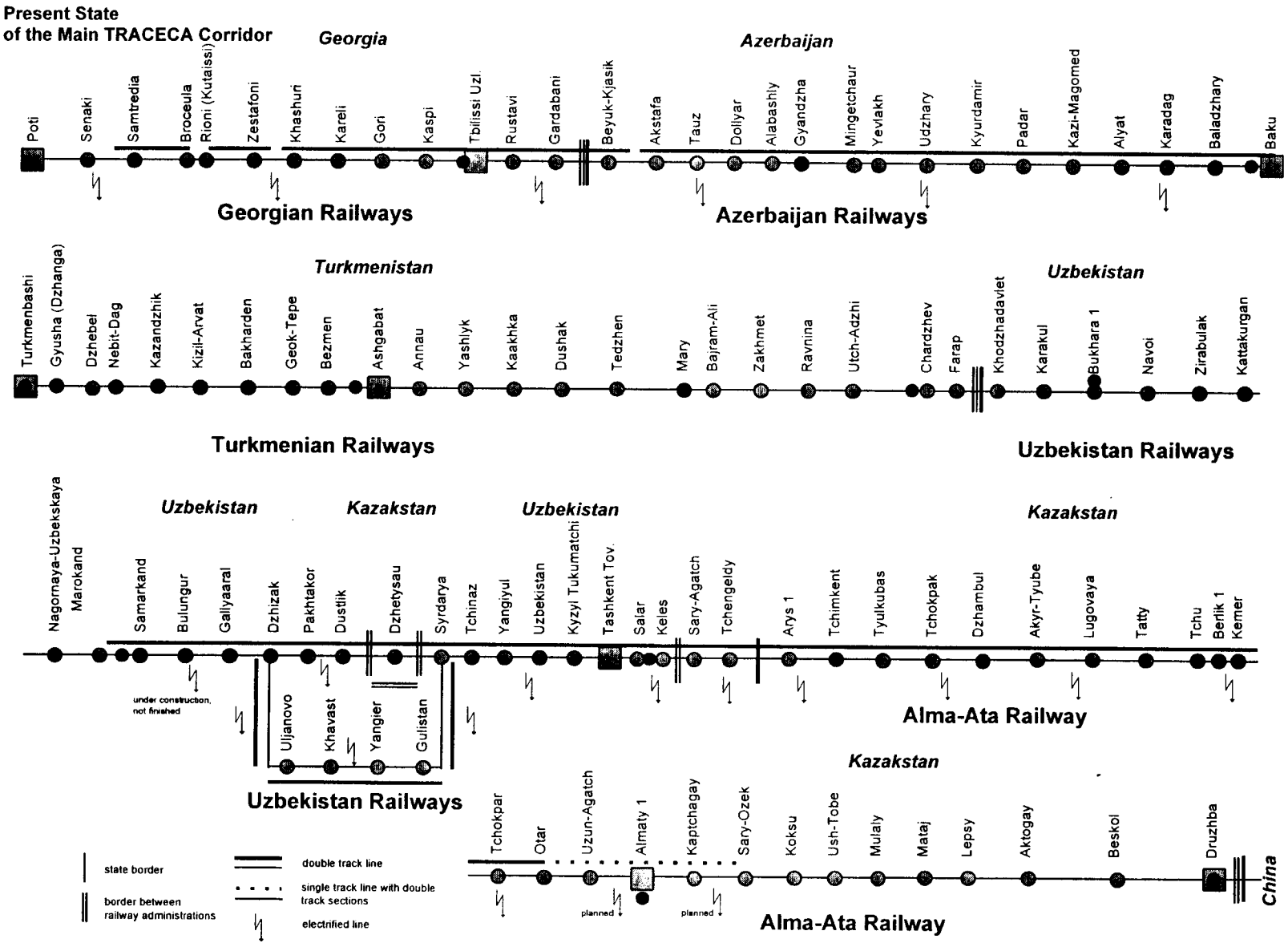
Section	State
Poti (GEO) - Senaki	single track line, electrified
Senaki - Kolobani	single track line, electrified
Kolobani - Samtredia - Brozeula	double track line, electrified
Brozeula - Rioni	single track line, electrified
Rioni - Sestafoni - Shorapani	double track line, electrified
Shorapani - Dzirula	single track line, electrified
Dzirula - Marelisi	single track line with double track sections, electrified

Marelisi - Tbilissi - Beyuk-Kjasik (AZE)	double track line, electrified
Beyuk-Kjasik (AZE) - Gyandzha - Baku	double track line with one small single track section near Akstafa (bridge over Kura river), electrified
Turkmenbashi (TUR) - Ashgabat - Chardzhev - Farap- Khodzhadavlet (UZB) - Bukhara - Marakhand	single track line, non-electrified
Marakhand - Samarkand - Dzhizak	double track line, non electrified, but electrification is planned for the short term
Dzhizak - Dustlik - Syrdarya	double track line, under electrification (completion expected in 1997)
Dzhizak - Khavast - Syrdarya	double track line, electrified
Syrdarya - Tashkent - Tchengeldy (KAZ) - Arys - Tchimkent - Dzhambul - Lugovaya - Berlik 1 - Otar	double track line, electrified
Otar - Almaty 1 - Sary-Ozek	single track line with double track sections, electrification planned
Sary-Ozek - Aktogay - Druzhba	single track line, non-electrified

The connecting lines to Armenia (from Tbilissi Uzl.), Kyrgyzstan (from Lugovaya station in Kazakstan) and Tadjikistan (from Samarkand or Bukhara in Uzbekistan) are single track lines and with the exception of the line to Armenia (Tbilissi - Gyumri - Vanadzor - Yerevan) non-electrified.

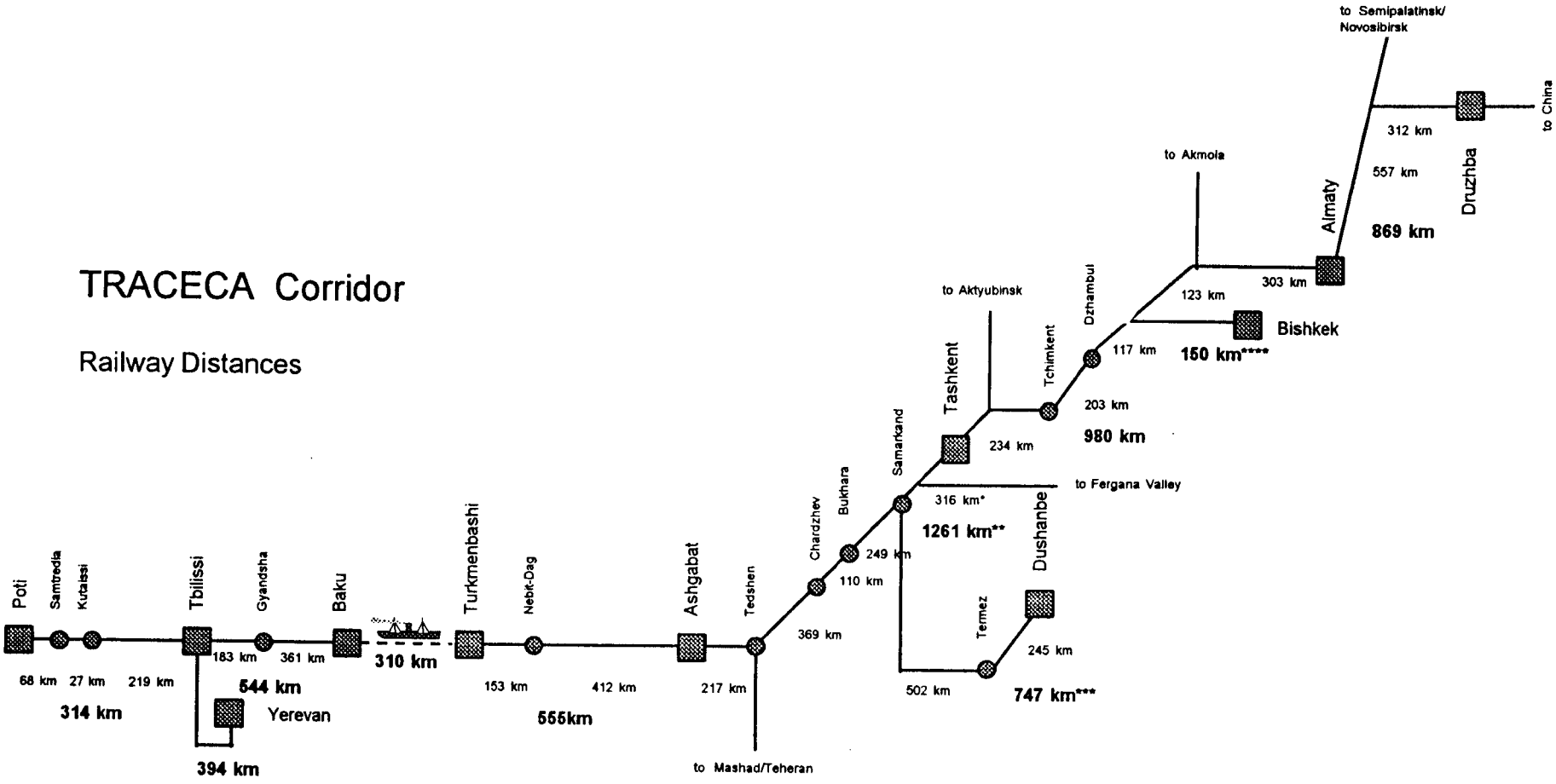
A specific problem of the corridor is the insufficient capacity of the interface Druzhba/Alashankou between Kazakstan and China (opened in 1991) caused by the inefficient unloading facilities and lack of wagons at the Chinese railways. Thus, considerable congestion of wagons from Druzhba into the Kazak network takes place (more than 1000 wagons) which results in serious operational problems on the Kazak railways. The result is a temporary stoppage on acceptance of goods to China from time to time. It must be noted that some improvements on the Chinese side are planned in the medium- and long-term.

The following two figures summarise the current state of the main rail infrastructure along the TRACECA corridor:


Present State
of the Main TRACECA Corridor
Georgia
Azerbaijan
Poti
Senaki
Samtredia
Broceula
Rioni (Kutaissi)
Zestafoni
Khashuri
Kareli
Gori
Kaspi
Tbilissi Uzl
Rustavi
Gardabani
Beyuk-Kjasik
Akstafa
Tauz
Doliyar
Alabashly
Gyandzha
Mingetchaur
Yevlakh
Udzhary
Kyurdamir
Padar
Kazi-Magomed
Alyat
Karadag
Baladzhary
Baku
Georgian Railways
Azerbaijan Railways
Turkmenistan
Uzbekistan
Turkmenbashi
Gyusha (Dzhanga)
Dzhebel
Nebit-Dag
Kazandzhik
Kizil-Arvat
Bakharden
Geok-Tepe
Bezmen
Ashgabat
Annau
Yashlyk
Kaakhka
Dushak
Tedzhen
Mary
Bajram-Ali
Zakhmet
Ravnina
Utch-Adzhi
Chardzhev
Farap
Khodzhadavlet
Karakul
Bukhara 1
Navoi
Zirabulak
Kattakurgan
Turkmenian Railways
Uzbekistan Railways
Uzbekistan
Kazakstan
Uzbekistan
Kazakstan
Nagornaya-Uzbekskaya
Marokand
Samarkand
Bulungur
Gallyaaral
Dzhizak
Pakhtakor
Dustik
Dzhetysau
Syrdarya
Tchinaz
Yangiyul
Uzbekistan
Kyzyl Tukumatchi
Tashkent Tov.
Salar
Keles
Sary-Agatch
Tchengeldy
Arys 1
Tchimkent
Tyulkubas
Tchokpak
Dzhambul
Akyr-Tyube
Lugovaya
Tatty
Tchu
Berlik 1
Kemer
under construction,
not finished
Uljanovo
Khavast
Yangier
Gulistan
Alma-Ata Railway
Uzbekistan Railways
Kazakstan
Tchokpar
Otar
Uzun-Agatch
Almaty 1
Kaptchagay
Sary-Ozek
Koksu
Ush-Tobe
Mulaly
Mataj
Lepsy
Aktogay
Beskol
Druzhba
China
planned
planned
Alma-Ata Railway
state border
border between
railway administrations
double track line
single track line with double
track sections
electrified line

TRACECA Corridor

Railway Distances



* via Dzhizak - Dustlik - Dzhetysaj - Syrdarya
(the distance via Dzhizak - Khavast - Yangier - Gulistan - Syrdarya is 354 km

** via Dzhizak - Dustlik - Dzhetysaj - Syrdarya
(the distance via Dzhizak - Khavast - Yangier - Gulistan - Syrdarya is 1299 km

*** from Samarkand

**** from station Lugovaya

As for roads, the existing infrastructure, although not always in good condition, does not represent any impediment for the practice of multimodal transport. In Kazakstan, nearly the entire road network is made up of at least two lanes. In general, roads are in a relatively good condition. Over 50 % of the 20 000 km of roads of Kyrgystan are paved and sufficiently well-maintained. However, one of the main roads connecting Bishkek to Osh, the two major industrial centres, is deteriorating. Road transport, with about 72% of the freight traffic, is by far the most important transport mode of Kyrgystan.

In Uzbekistan, there are two main links:

* A north-east↔south-west link connecting Tashkent to Karakul in Turkmenistan, (through Bukhara, Navoi and Samarkand) of which 42% is in good condition,

* A south-west↔north-west link between Termez and Nukus via Bukhara (677 kilometres) is in good condition or under repair while 58% is deemed to be in fair condition. The road from Turkmenbashi to Chardzhev is in good condition.

In the Caucasian region, the principal road in Georgia, the « Magisterial », running from the Azeri border through Tbilissi, along the Valley between the two ranges of the Caucasus has a pavement in an acceptable condition.

A complementary description of rail and road infrastructure, as well as a series of country maps is presented in Annex 4. More detailed information and analysis are provided by the following TRACECA projects: Railways infrastructure maintenance (state of railways) and Pavement management systems (state of roads).

2.1.3.3. Ports Infrastructure and equipment

The multimodal elements to examine are confined to:

- The design of container ports (container terminal and RORO terminal),
- The storage container capacities,
- Handling facilities,
- Vessels (here only RO/RO vessels and ferries).

The design of container ports

Ideally, a terminal designed for containers consists of a large platform, totally free of any building, where the storage and circulation around the container rows are easy to perform. Along the quay wall, rail mounted cranes of 40 tons are available to handle the container from a ship to any type of land transport support. To facilitate operations (circulation of trucks, roll-trailers, transfers, storage, etc.) rail tracks (from cranes or railways) are embedded into the floor. At one border of the platform or in a location near the port, there is a CFS shed (Container Freight Service[18]) for stuffing/unstaffing « LCL containers »[19]. At the opposite border, railway tracks are located. To accelerate the handling and transfer, the terminal is provided with mobile equipment (tractors, trailers, or roll-trailers, straddle carriers or stackers and forklifts). The administrative building is located at the entrance gate of the terminal so that container movements can be controlled.

As for RO/RO terminals, the main platform, which should be large enough, must be free of buildings or rail tracks to make truck circulation and control procedures (clearance before embarking etc.) as easy as possible. According to the type of RO/RO vessels, a RO/RO ramp may be needed. For ships with a stern

[18] a CFS is a station for stuffing/destuffing containers by container operators located in the port or near the port.: this is particularly useful for « LCL containers » or containers partially loaded which can be completed before sent to a final destination. For FCL containers (full container loaded), a CFS is not required.

[19] Less than Container Load

ramp, it must have an inclined slope on the quay apron. For ships with a quarter ramp or a side ramp, no specific installation is needed.

The following table summarises the situation observed in the TRACECA countries.

	PORTS	Key observations
General remarks	**all ports**	Apart from Baku, there is risk of flooding due to the rising level of the Caspian Sea (2 metres from 1977), particularly in Turkmenbaschi: at the ferry terminal the maximum operating limits are almost attained. Problems with the rail tracks (from railways and cranes) which are not embedded into the floor make operations difficult (open storage, circulation of trucks, waste of time, etc.) in all the ports. The backup areas for efficient container operations have been seriously underestimated in all ports. In Baku, there is a serious lack of parking space for trucks. It makes the co-ordination and operations particularly difficult (trucks represent about 50% of the ferry traffic).
Handling facilities	**Aktau**	Poorly underprovided because of the tradition of loading and discharging direct to rail wagons. Containers are currently handled over the general cargo berth, without specialised equipment.
	Turkmenbaschi	Restricted lifting capacity of the 6 cranes (insufficient for 20 feet containers). There is no RORO ramp.
	Baku	Sufficient handling equipment: 8 cranes along the western quay side of the mole (40 tons) and 3 others along the eastern quay side (20 tons) are sufficient to handle 40 feet ISO-containers. Two of these cranes are located on the western side of the mole which could be dedicated to containers. There are 50 container-mover available but these are under utilised.
	Poti	The general cargo has cranes with a lifting capacity of 16 to 32 tons. On the container terminal, there are 3 rail mounted cranes capable of handling 40 foot containers. One floating crane of 100 tons is also available.
Storage container facilities	**Aktau**	Inadequate provision because of the tradition of loading and discharging direct to rail wagons. There is no yard available for stacking containers.
	Turkmenbaschi	Inadequate provision. As container traffic is only 400 units, problems are not serious. If the traffic increases, as it is anticipated, the port will not be able to operate efficiently.
	Baku	Only 2 of the 8 hectares of the main complex can be used for container storage (most of the available area is congested by rail tracks not embedded into the floor). This could be largely sufficient, even if there is a traffic of 10 000 TEU to be handled.

	Poti	The container terminal has a platform of 24 000 m² (congested by rail tracks). Only 6 000 m² are available for operating and storing containers (about 560 TEU). The general cargo and grain berth are also congested by rail tracks not embedded into the ground. This restricts the storage capacity to only 16 000 m². Difficult circulation for trucks.
	Batumi	There is only a small container terminal. Limited port storage facilities for general cargo.
Vessel fleet	**Caspian Shipping Company**	The fleet of the Caspian Shipping Company includes: • 20 tankers, of 5 000 Dwt • 5 tankers of 12 000 Dwt • 9 tankers of 5 500/7500 Dwt • 12 dry cargo ships of 3 000 Dwt • 11 dry cargo ships of 4 000 Dwt • 2 RO/RO ships 125 m. long, with a capacity of 365 cars or 84 trucks and 107 cars, or 33 trailers and 105 TEU. • 8 Railroad sea cargo-passenger ferries of 154 m. long Most of the container-carrier ships owned by the company have been chartered and operate out of the Caspian Sea. Only ferries operate on the Caspian Sea. Out of ten, five are hardly damaged, and two could be repaired. Three are serving on the Caspian sea, (three trips a week, each).
	Georgian Shipping Company	The GSC has 44 vessels. One third are reported to be too expensive to operate. They need repair, but are technologically obsolete. Joint ventures with foreign firms are under negotiation to repair 19 vessels.

2.1.3.4. Rail Container Terminal Network

This section describes the present state of the key multimodal installations and equipment.

a) location of container terminals,
b) terminal layout,
c) terminal equipment

a) *Location of the Railway Container Terminals*

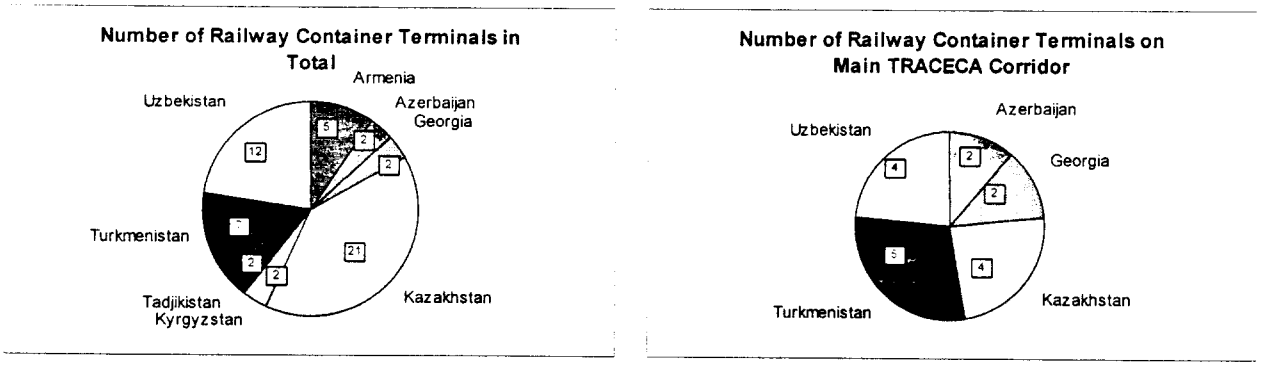
The FSU railways operated about 240 container terminals. About 50 of them (excluding terminals for medium sized containers) are located in the TRACECA region (20%). About 20 rail terminals are directly located on the main TRACECA corridor. Besides the railway terminals, some large industrial plants receive containers in their own private sidings.

Most of the railway terminals in the region are concentrated in Kazakstan (about 40%) and in Uzbekistan (about 25%). An under developed network of container terminals has been working in Azerbaidjan, Georgia, Kyrgyzstan and Tadjikistan, consisting of two terminals per country only. The following figures summarise the situation:

Table 12: Number of Railway Container Terminals for Handling of 20' Containers

Country	Length of Railway Network, 1000 km	Number of Railway Container Terminals [20]	Terminal located on the Main TRACECA Corridor	Number of Container Terminals on 1000 km network[21]
Armenia	0.8	5	0	6
Azerbaidjan	2.1	2	2 Gyandzha, Khyrdalan	1
Georgia	1.6	2	2 Samtredia 2, Tbilissi Tov.	1
Kazakstan	14.4	21[22]	4 Almaty 2, Druzhba, Dzhambul, Tchimkent	1
Kyrgyzstan	0.4	2	0	5
Tadjikistan	0.5	2	0	4
Turkmenistan	.3	7	5 Mary, Nebit-Dag, **Obezberdy Kuliyev**, Serger, Turkmenbashi	3
Uzbekistan	3.5	12[23]	4 Bukhara 2, Dzhizak, **Shumilova**, Ulugbek	3
Total	25.6	53	17	2

Figure 7: Distribution of Rail Terminals per Country



The level of coverage of the territory by container terminals as well as the physical position of the terminal network, are not worth mentioning as major weak points of the multimodal transport system. Existing terminals are located near all capitals of the TRACECA countries and all the most important industrial regions and large cities in Central Asia[24]. Taking into account the terminal location and the industrial centres around the terminal, it is possible to define the efficient area or field of activities for road transport[25]. In Europe, relatively small countries with a high industrial density, the distance from a considered customer to the closest rail terminal is under 120 km. The area of influence of a terminal, called « catchment area », is

[20] without terminals for medium-sized containers
[21] rounded to whole figures
[22] without terminals leased to Russia
[23] the old railway terminal in Shumilovo and the Shoshtrans-terminal were counted as one terminal
[24] Such as the Fergana valley (with Andizhan, Fergana, Kokand, Margilan, Namangan, Osh, etc.); Gafurov (Tadjikistan), Akmola, Aktyubinsk, Atyrau; Bukhara/Navoj, Chardzhev, Dzhambul, Dzhezkazgan, Ekibastus/Pavlodar, Karaganda/Temirtau, Karshi, Koktchetav, Kustanaj, Kzyl-Orda, Nukus, Petropavlovsk, Samarkand, Semipalatinsk, Taldy-Kurgan, Tashaus, Tchimkent, Uralsk, Urgentch, Ust-Kamenogorsk. Similar, in the Caucasus region, Gyandzha, Gyumri, Kutaisi (only via Samtredia, about 50 km distance), Rustawi (via Tbilissi), Sumgait, Vanadzor (former Kirovakan) are well covered.
[25] Under the multimodal concept, the role of road transport is to concentrate traffic flows around the closest rail terminal.

expressed in km² and has been defined for the main TRACECA-corridor. The following table summarises the «catchment area» for the 18 terminals directly located on the alignment as well as for two others, which can also easily be involved in container traffic services along this corridor.

Table 13: Average catchment area of the railway container Terminals

Terminal	Theoretical « Catchment area » covered by TRACECA terminals[26], in km²
(Poti Sea Terminal)	34
Samtredia	168
Tbilissi Tov.	154
Gyandzha	314
Khyrdalan (or Baku Sea Port)	188
Turkmenbashi	77
Nebit-Dag	271
Obezberdy Kuliyev	379
Mary	287
Serger	133
Bukhara 1	155
(Tintchlik)	95
Ulugbek	152
Dzhizak	192
Shumilova	148
Tchimkent	312
Dzhambul	378
Almaty 2	454
Taldy-Kurgan	210
Druzhba	498

Comments on the terminal location and level of covering the territory:

On the positive side:

- In general, the location of current terminals fits well with the requirement of the TRACECA trade (it does not concern the state of terminals). In principle, there is no need for the creation of new terminals (although an exception to this: private terminals in large enterprises or for important investment projects). These 17 terminals are able to serve Poti - Baku - Tashkent - Druzhba. Additionally to these terminals, there are some terminals located on branch lines very close to the main corridor[27]: Taldy-Kurgan in Kazakstan (about 50 km of the main corridor) and Tintchlik in Uzbekistan (near Navoj, about 20 km of the main corridor).

- The average distance between two terminals amounts to approx. 250 km. Only in Kazakstan are the distances significantly higher . Thus, efficient road services around the catchment area (delivery and collection of the containers between the terminal and the customers by the cheapest mode of transport for short distances) could be provided at lower cost.

- The catchment area, especially in Georgia and Uzbekistan as well as in parts of Azerbaidjan Turkmenistan, is particularly large. However, Kyrgyzstan, a mountainous country, and the Kazakstan terminal network have smaller catchment areas. In some areas of Kazakstan and Turkmenistan, the terminals have extended catchment areas, but this mostly concerns regions with a very low density of population and economic activity. In general, the main areas of concentration of the population as well as the main economic centres have container terminals namely:

    - all capitals of the TRACECA states
    - the Fergana valley

[26] The catchment area of a terminal on the corridor was defined as the mid-point to the neighbouring terminal (in both directions) or the border, if the neighbouring terminal was a foreign terminal.

[27] not mentioned in the figures (Annex)

- other important centres in Central Asia such as:

  Akmola, Aktyubinsk, Atyrau, Bukhara/Navoi, Dzhambul, Dzhezkazgan, Karaganda/Temirtau, Karshi, Kzyl-Orda, Koktchetav, Kustanaj, Nukus, Pavlodar/Ekibastus, Petropavlovsk, Samarkand, Semipalatinsk/Ust-Kamennogorsk, Taldy-Kurgan, Uralsk, Chardzhev, Tchimkent important centres in the Transcaucasus region such like: Gyandzha, Gyumri and others.

On the negative side:

- The biggest problem at terminals (as described in a further section: terminal equipment) is connected with necessary improvements of technical standards.

- Whilst in general, there is no need to create new terminals, there is a medium/long-term requirement for removing some of the existing terminals to more advantageous locations:

  * Bukhara: there is a project to build a large cotton handling centre, including a container terminal. If the project is confirmed, the existing very small terminal Bukhara 2 should be replaced.

  * Tchu: Kazak authorities would like to consider the creation of a terminal in the Tchu region (between Dzhambul and Almaty) to concentrate freight traffic flows from Dzhambul area, South Kazakstan and Kyrgyzstan. The problem of Tchu is the comparatively long road distances between the main users (origins and destinations) and the potential terminal site (approx. 320 km to Almaty, approx. 100 km to Bishkek and about 250 km to Dzhambul). On the other hand, the freight traffic available locally, in the region of Tchu, seems very low. An additional problem is that the Kyrgyz authorities are not prepared to accept Tchu or any other foreign terminal as a place to concentrate the traffic generated in Kyrgyzstan. For all these reasons, the possible traffic concentration in Tchu can not be recommended by the Consultant.

  * Almaty: the future removal of the terminal Almaty 2 to the Almaty 1 station was under consideration. A long term project, because of limited extension possibilities in Almaty 2. It must be noted that some forwarding companies are studying, (at a preliminary stage) the creation of new forwarding facilities, including container handling in Almaty.

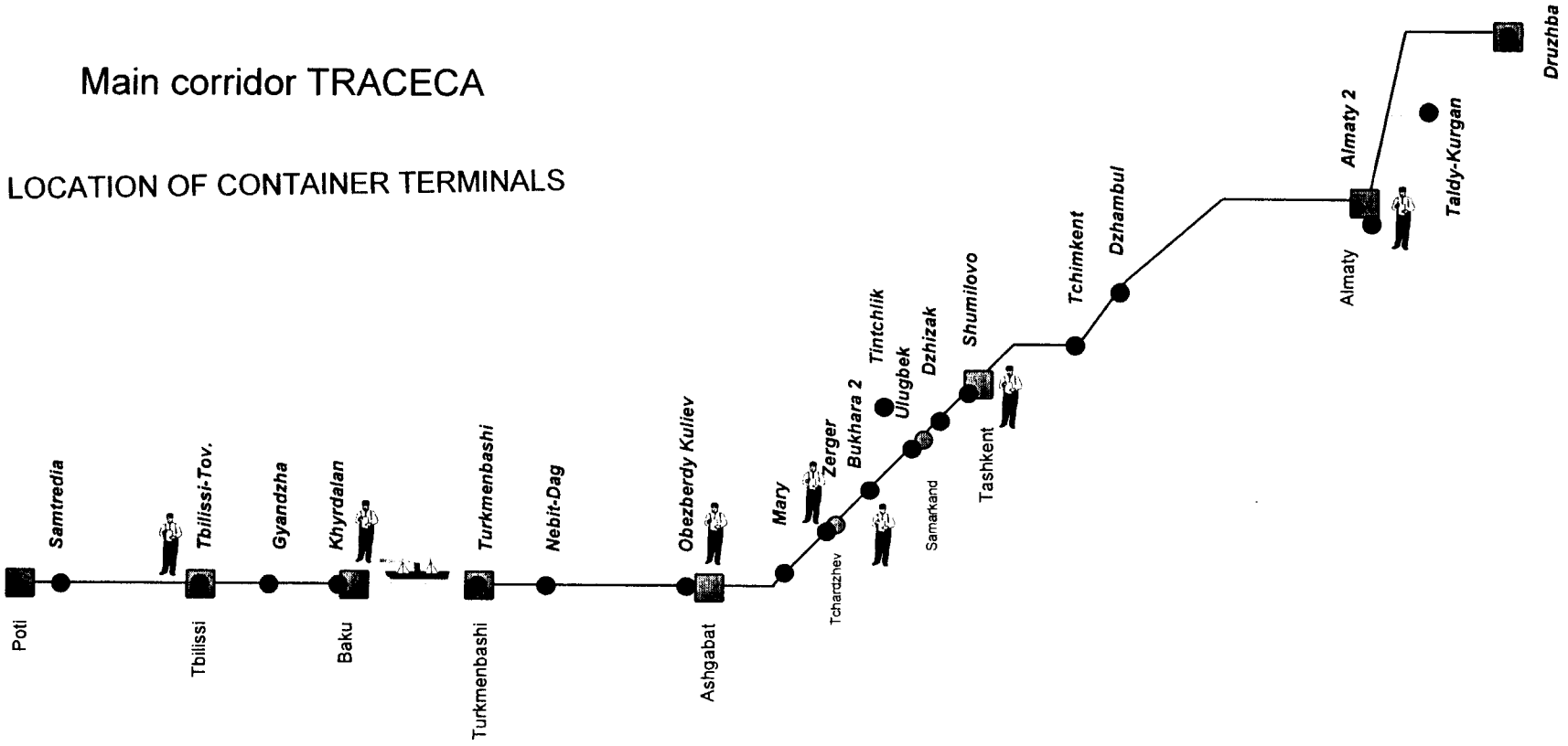
Taking into consideration the lack of funds in the region, it would be useful to up-grade existing terminals (handling systems) and concentrate the efforts on a reduced number of terminal locations where the population and economic activities are concentrated (e.g. Almaty, Ashgabat, Baku, Tashkent[28], Tbilissi, Bukhara or Samarkand, as well as the Fergana valley and Akmola which are both alongside the main corridor).

The following chart summarises the location of the main railway container terminals on the main TRACECA corridor.

[28] already done taking into consideration the well developed state of the Shoshtrans-Terminal in Tashkent-Shumilovo

Main corridor TRACECA

LOCATION OF CONTAINER TERMINALS



railway container terminal (without specialised terminals for so-called medium-sized containers)

terminals visited during field missions

b) *Terminal Layout and conditions*

Modern container terminals comprise several components which must be considered according to the container activity:

- efficient handling equipment (cranes and/or reach stackers or container handling lifts);
- the track length under crane should be long enough to receive a full train without any additional shunting operations (which result in operation time benefit)
- rail connections must allow a direct entrance and exit of trains from/into the long haul railway network (without involvement of shunting locomotives),
- clear separation of storage and driving lanes for road vehicles
- additional storage areas outside the crane track area,
- good connections with the road network,
- other facilities should be available: parking areas, auxiliary buildings, administrative building,
- railway tracks must be installed straight horizontal alignment (no curves)

The following table is an example (from Western Europe) of equipment requirements and layout for small and medium-size terminals according to the traffic.

Table 14: Example of Terminal equipment requirements according to traffic

TEU per day	up to 60	up to 125	up to 185	up to 250	up to 370
Units per year, optimum	13,000	26,000	39,000	52,000	78,000
Number of loading tracks	1	2	3	2	3
Length of loading tracks, m	350	350	350	700	700
Width of the module, m	19	22-25	29-30	22-25	29-30
Terminal layout (scheme)	S/D/L/R	S/R1/L1/D/L2/ R2 or S/L/D/R1/R2	S/R1/R2/L1/ D/ L2/R3	S/R1/L1/D/L2/ R2 or S/L/D/R1/R2	S/R1/R2/L1/D/ L2/R3 or S/L1/D/L2/R1/ R2/R3
Handling equipment	mobile equipment	1 crane	1 crane	2 cranes	2 cranes

S - storage lane; L - loading lane
D - driving lane R - railway track

As for the TRACECA region, the layout of the existing terminals is based on the Soviet Standards. According to these standards, container terminals were classified in several size categories. The final decision to build a terminal depended on the planned capacity. According to the planned capacity, the equipment to be included (number of cranes; number of tracks / storage capacity / length of the storage area / useful length of tracks under the crane) were defined according to the following table.

Table 15: Terminal classification used on CIS-Railways

Planned unloading capacity (containers/day)	Number of cranes	Number of tracks under the crane	Storage capacity (containers)	Length of the storage area, m	Useful length of tracks under the crane
more than 120	minimal 3	2	more than 500	more than 600	more than 650
101-120	2 - 3	2	420 - 500	532 - 623	545 - 640
81-100	2	2	335 - 410	435 - 520	450 - 535
55-80	2	2	225 - 325	300 - 415	310 - 425
30-54	2	1	120 - 216	167 - 282	175 - 282
less than 30	1	1	less than 120	less than 135	less than 140

In the eight countries of the TRACECA region, 50 terminals have been inventoried and studied. With the exception of Almaty 2, Shumilova (old and new) and Obezberdy Kuliyev, the existing terminals belong to the

medium and small categories. On the main TRACECA line representative terminals from each category (out of the 20 terminals in the corridor) have been visited:

- large: Almaty 2 , Shumilova (old + new), Obezberdy Kuliyev
- medium: Alamedin, Tbilissi Tov., Khyrdalan
- small: Serger (Chardzhev), Bukhara 2

It must be emphasised that the so-called terminal for « small and medium containers » (3 and 5 tons) and the terminal for handling « large containers » (20' containers) were designed and located in different segregated areas within the same station or, sometimes, in other stations on the same rail junction.

Besides the railway terminals, some large industrial plants receive containers in their own private sidings. Unfortunately it was not possible to visit and obtain reliable data from private sidings[29].

As far as the layout and technical conditions are concerned, the 20 TRACECA terminals suffer from the following:

- as a rule, the length of the terminal tracks has been calculated for a placement of a half or quarter train only. As a consequence, the length capacity, under the crane, can operate with a maximum of 10-12 flat wagons. Therefore, there is a restricted possibility for a full direct train (normally composed of about 20 flat wagons), to enter into the terminal. This restriction makes it necessary to split-up trains into parts which is a time consuming procedure.

- existing station layouts and signalling systems do not allow direct entry or departure of trains into/out of the terminal. Several shunting trips from/to the neighbouring station (or shunting yard) must be performed by shunting locomotive.

- as a rule, the unloading technology is based on a high portion of indirect unloading « via storage area ». This is partly due to the lack of information provided in advance to the terminal by the customers or their forwarders.

- as a rule, there are only one or two tracks under the crane/cantilever.

- as a rule, there is only one loading lane for lorries under the cantilever,

- the opportunities for future development are restricted by the lack of available areas on-site (particularly serious problem for Tbilissi Tov., Bukhara 2, Almaty 2, etc.)[30].

- the terminals do not have "independent" facilities. The available areas are part of the loading and unloading facilities of the existing railway station.

- apart from some large container terminals (Shumilova, Alamedin, Obezberdy Kuliev), the TRACECA terminals are in poor or even very poor condition, especially in the Transcaucasian region.

- with the exception of Bishkek-Alamedin, the connecting access roads to the terminals are in poor condition. This comment applies to the well-equipped terminal in Shumilova.

- damaged pavements (concrete, asphalt, concrete panels or simply consolidated grounds with gravel) obstruct the use of mobile reach stackers because the lack of necessary static stability for container handling as well as restricting use of all rubber tyred vehicles or equipment (because of the damage to tyres),

---

[29] Some of the railway administrations informed that the use of containers on private sidings of former large industrial plants has collapsed as a result of the economic crisis. Most of these local companies did not own terminals, they loaded and unloaded the containers directly on the railway wagon (because of the lack of heavy cranes or reach stackers). Doing this they require the assistance of a terminal nearby to rotate the containers so as to be able to open the front wall doors. This does not concern some Western companies (e.g. Daewoo in Uzbekistan) which are at present working with containers at their own private terminals.

[30] this does not concern to some terminals built outside or on the edge of existing stations (e.g. Khyrdalan, Obezberdy Kuliyev, etc.)

- the available storage areas under the crane are not paved. Additional storage areas are located outside of the crane area but, in general, the pavement of storage areas is also in poor condition.

- the fences are damaged and it is not possible to prevent the entrance of un-authorised persons into the terminal as well as larceny of freight or to assure the security of freight from theft.

- the terminals are not equipped with special power supply sockets in the storage area normally required to supply energy to the refrigerated containers. Accordingly, they have to use their own on-board diesel engines.

A particular case is the terminal of Khyrdalan in the northern outskirts of Baku (about 25 km from the city and the port), which has been out of operation for more than one year:

* The terminal is poorly designed to be served by road trucks carrying containers, with narrow access road in poor condition,
* Most of the cranes are out of order (with no spare parts, and partly cannibalised),
* The Valmet fork lifts are damaged or have been removed to Kishly
* Very poor condition of pavement of the storage areas and the loading lines (with large potholes, and steel reinforcement jutting out of the concrete),
* Fences are damaged or non-existent and there is no illumination,
* Poor condition of rail tracks.

Because of the critical state of this terminal the Transcaucasian Logistic Train from Poti is being temporarily handled on a loading area of the Kishly marshalling yard.

The Consultants were told that there is a project to reconstruct this terminal ($US 1 million investment, according to the Azerbaidjan railways calculation). However, the lack of funds has halted the work. Taking into consideration the unfavourable location of the terminal (with respect to the city and the port), the bad climatic conditions (exposed to stormy weather, with gale force winds exceeding 6 during about 240 days per year), it is advisable to construct the terminal in an alternative location, nearer Baku (e.g. in the port of Baku). Further pre-investment investigations are required.

The unloading terminals on the borders to China (Druzhba) and Iran (Sarakhs, just partly opened) are special cases. They have been designed for the direct unloading between railway wagons of different gauges and not for unloading between rail and road. Thus they have two tracks of different gauge under crane. A particular technical aspect of Druzhba terminal is that it was built as a covered terminal (length in operation 260 m, extension planned to 400 m, two 30.5 t cranes inside the bay) because of the stormy winds. Additionally a small open terminal is available and can be used for unloading between lorries and railway wagons.

As a conclusion on the layout and technical conditions, the terminals are able to handle the present and medium-term traffic volumes. Current traffic volumes are much lower than 60 units per day in all terminals. A limited upgrading and procurement of equipment for the existing terminals will be sufficient. In all terminals, it is necessary to make repairs to improve the pavements of the storage areas and the rail and road connections. The most important problem is connected with the handling equipment. The situation in Baku deserves special consideration to find a specific solution.

c) Handling equipment in rail terminals

The existing handling equipment in railway terminals is without doubt the major weak point of the network. For Europe-TRACECA trade purposes, the development of multimodal transport suffers particularly from the lack of handling equipment for 40' containers which is the usual type of unit load on these routes.

In total all container terminals of the former SZD were equipped with about 350 container cranes. That means that on average the container terminals were equipped with 1.5 cranes each. The lifting capacity of the cranes is up to 20 or 24 t. At present about 40 or 50 % of terminal cranes are out of operation due to lack of spare parts. Many of them have been cannibalised. As the traffic is low, there are no serious problems in

handling current 20' container traffic. However, if the traffic increases, in the medium - long term, a large proportion of the older cranes will need to be replaced.

Most of the cranes in the terminals are from older Soviet (KK series) or East German (TAKRAF, supplied in 1975-1979) production lines. The average age of the cranes is generally more than 20 years.

Table 16: Technical characteristics of cranes used on railway container terminals

Type	Lifting capacity, tons	Span, mm	Usable cantilever, mm	Speed of crane movement, m/s	Speed of trolley movement, m/s	Lifting speed, m/s
KK 25/25	25	25,000	5,000	1.00	0.80	0.20
KK 20/25	20	25,000	5,000	0.83	0.66	0.16
KK 32/25	32	32,000	8,000	1.05	0.53	0.13
KK 305N	32	32,000	-	0.36	0.41	0.13

These cranes are equipped with spreaders for fixing of ISO-20' containers. They are not able to work with the automatic fixings on 40' containers, or other types of containers such those in use in Europe, e.g. the "Transfracht-Binnencontainer" because the spreaders are not adjustable. In order to handle 40' containers, the terminals often use alternative unconventional methods such using 2 cranes and fixing with hawsers or using heavy cranes in other unloading areas outside the terminal or heavy mobile truck-mounted cranes or even railway cranes. Telescopic spreaders with folding grapple arms or simply gears for lifting of swap bodies or trailers are completely absent.

The Annex 5 summarises the handling capabilities of the existing terminals. As indicated, the terminals of Gyandzha and Samtredia (Georgia) are particularly poorly equipped: two cranes, each of 10 t lifting capacity, are required simultaneously to lift one 20' container.

Usually, the terminals are working only with fixed rail-mounted cranes. Mobile equipment such reach stackers or container handling front-lifts are not generally in use with two exceptions :

* the Khyrdalan terminal (near Baku, Azerbaidjan) has previously been working with two older heavy "Valmet" fork lift trucks (16-18 t lifting capacity) without spreaders. However, one of them is now damaged and the second one has been removed to Kishly station.

* the Shumilova terminal owned by the semi-private stock company Shoshtrans is equipped with modern container handling front lifts with spreaders able to lift 20' and 40' containers and five level stacking[31] (Boss G36-38 Retractor) of the BOSS company (UK). From the point of view of the handling equipment, it is the best terminal in the region and the only one which is able to handle 40' containers in a normal way (without using conventional methods).

The Alma-Atinskaya railway is planning the procurement of similar reach stackers for the terminal Almaty 2.

In conclusion, there is no immediate need to replace the existing handling equipment, since the traffic is flat and even decreasing. The reasons for this situation are connected with important deficiencies at the operational, organisational and commercial level. On the other hand, to stimulate an increase in traffic, it is necessary to equip small and medium terminals with lifting facilities able to handle 40' containers, particularly mobile reach stackers. In large terminals, in addition to mobile equipment, rail-mounted cranes should be necessary in the near future. Taking into consideration the lack of funds in the TRACECA countries, it is necessary to concentrate the effort on a few key terminals, with comparatively large catchment areas.

[31] In practice, containers are stacked no higher than three layers.

2.1.3.5. Other technological aspects

This section describes the present state of the other multimodal elements, namely:

a) container rail wagon fleet,
b) container related truck fleet,
c) container fleet,
d) palletisation.

a) Container rail wagon fleet

In 1992 all the rolling stock of the FSU's Railways was divided between the newly organised railways of the CIS-states including Georgia and the Baltic States (Lithuania, Latvia and Estonia). Every type of wagon was divided by a special ratio based on the contribution of each railway in freight traffic transport. The age structure of the types of wagons was also taken into consideration. This division concerned the open wagons, including hopper wagons (e.g. for cereals, cement and mineral fertilisers), covered wagons, flat wagons (including container flat cars), most of the tank wagons, as well as some of the specialised wagons.

Certain types of special wagons (including refrigerator cars, which were divided only in 1994) were allocated by other principles (mostly to the railway administration where the home depot of the wagons was located).

Now, all the CIS-railways and the Baltic railways have signed an "agreement concerning the mutual use of the stock of freight wagons". The main principles are:

- free movement of freight cars (with the exception of certain type of special wagons),
- no strong differentiation between own and foreign wagons in operational procedures,
- installation of a clearing system for the use of foreign cars (including sanctions calculated in UIC-Francs),
- each railway should repair and maintain only its own wagons. Foreign wagons will only be repaired, based on special agreements between the railways; thus the railways need an adequate system for checking the received wagons on the border stations and to reject the taking over of damaged wagons,
- the netwide distribution of empty wagons is centralised in Moscow for the territory of the FSU (the main computer centre of the MPS in Russia calculates a monthly plan of exchanging of empty wagons between all CIS and Baltic Railways. On this basis each Railway organises the internal operative disposition of the wagons inside its network).

For transport of 20' and 40' containers on the railways, the following wagon types are used:

- series-produced specialised container flat cars with prolonged axle-base and cushioning device for three 20' containers or one 40' container and one 20' container,
- converted wagons (former normal flat wagons or wagons with stanchions) for two 20' containers (or one 40' container)[32],
- normal flat wagons or open wagons (especially for empty containers), in this case additional fixing of the containers is required.

Normal flat wagons or open wagons will be used in the case of non-availability of specialised wagons only. In general the railway administrations indicated that the use of these wagons was insignificant, but during the field mission in some terminals those wagons with containers were observed.

The useful lifespan planned for the newer container wagons amounts to about 30 years (limited by the life of the bogies). In contrast to some types of Western Europe rolling stock the specialised container flat cars have wooden or metal floors able to carry different kinds of road vehicles, including military vehicles.

[32] a large proportion of the conversion of old flat wagons into container cars (3 000 wagons per year) was done at the Bukhara repair shop (Uzbekistan) of the former Soviet Central Asian railways. Now this programme has been stopped.

Table 17: Main characteristics of the exiting rail wagons

Type of wagon	Number of axles	Load capacity, tons	Tare weight, tons	Length over couplers, mm
13-470	4	60	22	19620
13-9904	4	65	26	19620
11-H004	4	60	22	14134
13-455	4	62	21	14620

The specialised container flat cars are cars with twin-axle bogies and roller bearing axle boxes. Two-axle cars are not used in commercial operations.

The broad-gauge wagons of all CIS railways are coupled by means of automatic central buffer couplers. The coupling of these wagons with wagons of European standard-gauge railways (screw couplings) is not possible without additional technical equipment.

Importantly, the static construction of the goods wagons of both technical systems is affected by the different coupling systems which results especially in differences of the static critical load. Goods wagons with automatic central buffer couplings are designed for a central transducing of the tractive and pressure force of the wagon body and have no side buffers. Concerning goods wagons with screw coupling the forces of pressure are transmitted at the sides by buffers and the tractive forces are transmitted in the centre by the screw coupling.

The specialised container flat cars as well as the converted container cars are equipped with twist locks or fixed arbors only (on most of the converted wagons) for fixing the containers using the standardised corner fittings of the containers. The admissible maximum construction speed of the wagons amounts to 120 kph.

The railway companies of the TRACECA region do not own specialised wagons for other kinds of multimodal transport besides container traffic. For example, special piggyback cars or ultra-low-floor wagons for the carriage of trailers and lorries are not available.

Since the division of rolling stock in 1992, the railways of the TRACECA countries have de facto not obtained any additional freight wagons for three main reasons:

- the number of wagons received as a result of the stock division fully covers the demand of the customers, because of the considerable decrease of traffic volumes for all kinds of wagons,
- the lack of funds to obtain new wagons,
- many railways wagons have been cannibalised due to the lack of spare parts for the working stock of cars.

Thus actually, the railways of Kazakstan, Uzbekistan, Turkmenistan and Kyrgyzstan have no problems in covering the demand for container traffic from the point of view of wagons disposal. On the contrary, many freight cars are out of operation and turned off (especially normal open, covered and flat wagons). In the medium and long term, problems could arise in the case of a rapid increase of traffic, especially on the smaller railways such as Azerbaidjan and Georgia[33]. For example the Kazak Ministry of Transport and Communication estimates that for the next 5-7 years no procurement of wagons will be necessary (with the exception of specialised tank wagons). Similar information was given by Turkmenian and Uzbek railway authorities[34].

Discussions held with the railway authorities indicated, that the railways at present have no plans to privatise parts of their rolling stock like some of the Western European railways. In general there was an interest in considering new models of operation and especially of future procurement of necessary rolling stock by private or semi private models. The existing legal framework of most of the countries does not allow privatisation of essential parts of railway assets or of railway property at all.

[33] In general as a result of the specific problems of the last few years in these two countries, the rolling stock situation is worse than on the Central Asian railways.

[34] The Uzbekistan railways plan only the procurement of specialised covered wagons for cotton transport

A main problem confronting most of the TRACECA railways was the covering of maintenance demand for the wagon stock after the separation of the Russian and Ukrainian railways, where most of the former repair shops were located. To solve this problem, the railways have undertaken consistent efforts in the last few years. Now most of them are able to maintain freight wagons in their own workshops or wagon depots (especially Kazakstan and Uzbekistan, which have already reached a very high level of demand coverage) or have plans to do this in the near future (Kyrgyzstan).

In summary, most of the railways have no problems to cover the demand for container traffic from their existing rolling stock. The container flat cars available are not compatible with Western Europe wagons (different gauge, different clearance, different braking and coupling systems). Wagons are aged and the condition is not always good, but there are not problems impeding container transport. The available fleet of container wagons is compatible with the short and medium term requirements. There is no need for new cars (except if there is a significant increase in traffic). The main problem is linked with maintenance and the procurement of spare parts, especially in the Caucasus region.

b) Containers truck fleet

In general, TRACECA countries are poorly equipped with trucks and chassis capable of carrying containers. The availability differs from one country to another: it is very limited in Tadjikistan, Turkmenistan and in the Caucasus. Kazakstan, Uzbekistan and Kyrgystan are better equipped. Turkish and Iranian operators, largely represented in the region, compensate for the lack of semi-trailers capable of carrying 20 and 40 feet ISO containers. However, they do not take part in multimodal transport (even though they do carry containers).

c) Containers fleet

The concept of container is the only type of modern unit load known in the TRACECA countries (swap body is unknown). Container transport is predominantly based on handling of 20' containers.

According to the former Soviet standards the system of unified transport units is divided into three groups:

- Large containers (20', 40')[35]
- Medium-sized containers (3 t and 5 t)
- Small containers (0.25 and 1.25 t)

Medium-sized containers are largely predominant and only used for domestic traffic and for internal CIS-traffic. The real stock of large containers consists of a fleet of 20' and 40' containers. The stock of 20 foot containers is large enough compared to the potential traffic. These containers comply with the international ISO-standards and other international rules for container traffic (e.g. CSC). The 20 foot container fleet comprises universal 20' ISO-containers (1-CC, 1-C) with a door on one front wall of the container. Special containers such as open-top, open-sided, flats as well as tank containers and refrigerator containers are not available. Some local industrial chemicals companies have their own tank containers (in Kazakstan for example). Concrete data on this was not available.

The owners of 20' containers are the railways, the maritime shipping companies, the inland navigation companies, road traffic companies, forwarders and industrial and trading companies. Road traffic companies, local forwarders and customers use containers predominantly only for their internal purposes and not in multimodal transport chains. The proportion owned by the railways in the overall FSU 20' container stock amounted to about 45 %. Now this railway stock has to be divided between new independent railway authorities.

The FSU railways did not own any 40' containers at all. Those containers were available only in some shipping companies. Most of the 40' containers in Central Asia are incoming containers from foreign operators. Most of them carry humanitarian aid (also refrigerator containers) and cargo for development projects (with Western assistance) or companies working with Western management (e.g. different mining companies, Daewoo, etc.). The number of such containers in the region is increasing, but there are a lot of

[35] The standards also included 10' and 30' containers, although these were not used in practice.

problems related to their use (e.g. lack of cranes or reach stackers able to handle them, lack of semitrailers/chassis, no return cargo).

Based on the number of containers in the property of the former Soviet Railways available in 1992 a methodology of division of container stock between the railways has been prepared by the Moscow Railway Research Institute and agreed between the Railways in the Framework of the Railway Transport Council of the CIS. Based on this, all the railway administrations have been assigned a part of the common container stock in accordance with their share in container traffic. The methodology of division considers the age structure of the container stock by division inside age groups and not by division of the total stock.

The railway administrations of the TRACECA countries expect the following numbers of 20 ' ISO containers:

Table 18: Number of expected containers by country

Railway administration		number of 20' containers expected
Armenia		
Azerbaidjan		1817
Georgia		1719
Kazakstan		9179
of them	Alma-Atinskaya Railway	36 % = about 3300
	Tselinnaya Railway	26 % = about 2400
	Western-Kazak Railway	38 % = about 3500
Kyrgyzstan		
Tadjikistan		
Turkmenistan		1649
Uzbekistan		about 10,000

Until now the actual division of the container stock has not taken place because of problems with the method of division as well as operational problems associated with the handling of "foreign" containers. The container count of 1992, as well as an additional count of 1994, taken as a basis for division must be corrected taking into consideration existing redundant containers. Due to this, there will be changes in the actual number of containers assigned to the railway administrations. The date of real division and the future technology of container operation are still under discussion.

Because of the collapse of the former internal container traffic system based only on 20' containers, after the eventual division the railways will have container stocks exceeding their needs to cover the real transport demand. Thus, there is no necessity for the railways to obtain new containers within the next few years. This has been confirmed during discussions with the railway authorities in the countries visited. In the long term, the railways will have to decide their future strategy in obtaining and operating containers. Taking into consideration the Western European experience of the railways, it is useful to consider new organisational frameworks for the management of the container stock (for example, transfer of the containers into a special multimodal operation company).

Most of the 20' railway containers were manufactured in the Abakanvagonmash plant in Abakan (Russian Federation, Siberia). Some containers were foreign imports (especially from India). Thus the TRACECA countries have no capacity for manufacturing containers. There was no information about plans for the organisation of container production during the discussions with the MOT's and the railway administrations in the countries visited.

Up to 1992, the FSU railways obtained about 15 000 - 20 000 containers every year. After 1992 (following division of the railways) new containers were obtained only by Russia, Belarus and Ukraine but these containers are not part of the common stock to be divided. The railways of the TRACECA region did not purchase containers at all. A result of this is the increase of the average age of the stock, which may cause problems in the medium and longer term (currently, a large number of containers are older than their planned useful economic life.

A general problem of the container stock is often their poor condition. One of the reasons relates to the improper handling of the containers at the terminals and by the customers. Because of the deterioration of the age structure of the stock and the lack of supply of new containers, the condition of the containers has significantly worsened.

In general, a well-organised system of maintenance based on a whole framework of internal railway instructions did exist in the past. The maintenance procedures were organised based on age (time in operation) and condition of the containers. However, only two of the 19 FSU railways repair shops for containers are located in the TRACECA region (Almaty in Kazakstan and Termez in Uzbekistan).

Most of the railways have begun to organise the maintenance of damaged containers at the main container terminals. Additionally, in some of the wagon depots, there are now facilities for container maintenance (although not in all countries). These facilities allow the repair of defects on doors or locks of the containers. Seriously damaged containers are usually taken out of stock and this is not a problem at present because of the excess stock of containers.

In summary, container transport is predominantly based on handling of 20' containers. The technical compatibility of the existing container stock is not a problem. The technical condition of the stock is declining. In the short and medium term, there is no need for new containers. In the longer term, all the stock will need to be replaced.

d) Pallets

In TRACECA countries, palletisation is almost unknown. Operators do not consider the use of pallets as a module/fraction of an ISO container. The main reason has to do with the structure of the existing distribution channels, still largely dominated by small shop owners. Although major retail distribution networks are under development, the use of pallets is confined to some recent supermarkets created by foreign firms. The question of returning the unloaded pallets dissuades exporters from systematic palletisation of their consignment. When used, pallets are of « last use » type. Furthermore, the lack of pallet handling equipment (lift, trans-pallets, etc.) and appropriated stacking installations explain the little use made of pallets. This situation slows down the process towards further containerisation.

2.1.4. Operational aspects

2.1.4.1. General

As previously explained, the multimodal system is based on the notion of modal complementarity. Road and rail must « combine » their respective advantages in order to make the system at least as competitive as single mode operations. The question of reducing operating cost at each link of the single chain is the central key to reach this objective. That is:

- To reduce the cost of road haul operations which usually represent about 35% of a combined transport operation. This can be achieved by reducing the number of trucks assigned to long distance transport and concentrating the available road fleet on moving containers to the nearest main terminal within the « catchment area ».

- To reduce the rail traction cost, which usually represents about 30% of the total cost of combined transport. This is done by the introduction of special container « Block Train » techniques to replace traditional A to B traction by individual wagons through successive shunting.

- To reduce the maritime transport cost by using specific vessels such as container ships or even RORO, instead of ferry-wagons. Ferry wagons are an excellent support, but do not containers to be stacked on the ship and this makes the container an inefficient support in terms of capacity carried.

- To reduce the handling operation costs by improving the organisation of the rail terminal: direct transhipment from the road truck to the rail wagon instead of transhipment via the storage area. This requires modernisation of handling equipment and, as far as possible, introduce the automatisation of terminals.

The organisation of this part of the study is as follows:

- Road operations from/to terminals,
- Rail container terminal operations ,
- Rail traction operations,
- Operations at Ports,
- Documentary issues.

2.1.4.2. Road operations from/to Terminals

Besides the higher costs on long distance journeys, a driver alone is not able to deliver a shipment by road over distances more than 400 kilometres/day. To offer attractive freight rates on the long distance market, road carriers should concentrate their activity on the haulage of containers from the user's premises to the closest combined rail terminal. Ideally, the main traction may be subcontracted to one independent combined transport operator (in its turn, this company should subcontract main traction to the railways)

To assume responsibility for delivery from the destination terminal to the consignee, road carriers and/or freight forwarders must extend their operations at the « other end » which implies the need to find reliable contractual partners. All these operations must be carried out carefully as they represent, in general, 35% of the total cost of a combined transport.

In TRACECA countries, the trucking sector was traditionally confined to local distribution by small lorries and did not usually work together with the railways. Although poorly equipped, the road sector is increasing its market share to the detriment of the railways. The road industry is competing with the railways on long distance transport instead of concentrating its activities on the short/medium distance market, which is the natural market segment for the road sector. The road industry approaches container traffic as a type of long distance freight forwarding towards Russian ports in Europe or in Asia for freight loads requiring a high level of transportation protection and safety. The overall container profit margins are necessarily low.

The existing terminal trucking of containers has been designed by the Railways as a simple extension to the railway freight forwarding system. The system has not been specifically designed to group, concentrate and distribute available freight in a given geographical area. Customers use these railways-organised services only under exceptional circumstances. Otherwise, from each railway terminal, they have to make their own arrangements to transport their freight to the destination point, using either their own trucks or those of a trucking company they selected and paid (namely « Militzer und Munch » in Ashgabat, « Kazinterfreight » in Almaty , « Cautrex » in Georgia).

This general context partly explains why the system is encountering difficulties in spontaneously generating a multimodal organisation with additional services, re-loading of containers, and possible re-use of empty containers. Empty containers often remain idle. For example, BOUYGUES containers in Turkmenistan (Bikrava), DAEWOO containers in Uzbekistan, MAV in Ashgabat, etc. The recent evolution is rather remote from what could be the logical choice in the TRACECA geographical context. This is to say the multimodal choice where an independent management should work for the benefit of all partners involved.

2.1.4.3. Rail container terminal operations

With the exception of the Shoshtrans-terminal in Shumilova all the terminals are the property and are under the direct management of the railway administrations. The technology of the terminal operations is closely connected to the technology of the work of the whole railway station. The terminal siding service is as a rule, organised by using the facilities and the rolling stock of the neighbouring freight station.

Direct entrance of trains from the network into the terminal sidings as well as direct departure from the terminal sidings respectively is impossible. It has never been required in the past because of the lack of specialised container trains. The transfer of the wagons with containers to/from neighbouring stations (or inside the station respectively) is organised by traditional shunting trips.

If, at the beginning of the chain, containers are loaded directly from the road chassis to the rail wagon, at the end of the chain the operations of unloading from rail wagon to the road chassis are based on a very high proportion of transhipment via the storage area.

Containers are loaded in such a way that the front wall door is on the inside (door-to-door or door-to-front wall if there are three 20' containers on one wagon). Therefore the containers can not be opened on the way and this prevents theft of goods. Consequently, single containers have to wait for a second container to the same station or to the same CIS-railway. As a result, container terminal operations for single containers suffer long delay. In principle, if this rule is respected, it is impossible to carry 40' containers on shorter railway wagons or to carry them on the longer special wagons without a 20' container going in the same direction (to obstruct the front wall door). In reality, because of the lack of freight, 40' containers are, contrary to this instruction, partly loaded .

Traditionally, to concentrate the container traffic flow all the terminals have weekly plans describing when, which day and to which terminal (CIS-railway or RZD-direction) a train is planned. These plans are given to the clients in advance so as to allow them to plan in time their logistical processes. At present, some of the TRACECA-railways have stopped using these plans because the volume of freight is too low.

Some container terminals were equipped with local computer systems for terminal management and control. Because of the collapse of the domestic container traffic most of these systems have been switched off as it is not very useful to manage only 5 or 10 containers per day by computer, this can be done traditionally by pencil and phone. In the event of an increase of traffic, these systems will have to be installed at the terminals (but on a modern PC-base). For example, Shoshtrans is planning the installation of a computer-based terminal management system for Shumilova.

The collapse of the traffic is also the reason why only a maximum of one crane in maximum per terminal is still used and that the working time and the staff have been reduced to only one daily shift.

Normally the customer will be informed about the arrival of his only container after physical arrival of the container and the freight documents at the terminal. The internal instructions of the railways demand that the client is informed during the day of arrival, but not later than 12 o'clock of the following day. Prior information concerning progress is not usual and has to be organised and paid for separately.

The delivery and collection of the containers between the terminals and the clients was the responsibility of the railways in the past. The containers were carried by railway-owned lorries/chassis or by lorries/chassis of specialised road traffic enterprises on the basis of agreements with railways. Some clients organised the delivery of the containers by themselves with their own lorries. Now different systems will be introduced and these will include:

- involvement of general or specialised forwarders who will organise the whole traffic process or parts of it (such as companies inside the Zheldorekspedicija system of the railways, Shoshtrans, Kazinterfracht, international forwarders and others),
- responsibility of the railways and trucking by local road traffic companies,
- responsibility of the railways and trucking by own trucks and chassis of the railways,
- organisation by the client of delivery and collection.

The loading and unloading of the containers at the customers premises will be performed directly on the chassis because most of the clients and road traffic companies are not able to lift down the containers from the chassis.

Problems have been identified concerning the technical state of the trucks and chassis (including lack of spare parts and especially of tyres) as well as the lack of chassis for 40' containers especially in Azerbaidjan, Georgia and Kyrgyzstan.

2.1.4.4. Rail traction operations

This section describes the present rail traction operations applied to container traffic:

a) the principle of container train formation.
b) TRACECA container train formation system.
c) Railway-based Information Systems Related to Intermodal Traffic.

a) The container train formation principles

The performance of combined transport rail operations essentially depends on the transport techniques adopted: rail traction from A to B by « Block trains » or operation of single wagon trains by successive shunting. Special « Block trains » mean suppression of costly shunting operations and reduced number of stops. These techniques are the key of reducing rail traction costs which usually represent about 30% of the total cost. They also help to increase the speed, reliability and security of transport operations. Furthermore, by suppressing the shunting operations, railway companies do not need to deal with the collection and delivery operations. Hence, immobilisation of the rolling stock at the users' premises is suppressed, turnover is therefore improved, working procedures are simplified and the need for infrastructure is reduced to the lowest possible level. However, special block trains need regular traffic (for example, 100 000 tons/year allows the daily composition of a 20 wagon special container train with a capacity of 40 TEU).

b) TRACECA container train formation system

In Central Asia and Caucasia, a specialised freight container rail traction system does not yet exist. The transport of containers is still subjected to freight traffic rules and regulations applied by each railway network to general rail freight traffic. The train formation, as for general traffic, is still based on the « operational targets » and the stations form trains only when a pre-defined « target » (maximal gross weight or with the maximal train length) is attained (there is no transportation masterplan). Thus, all the train paths are, in principle, only optional trains (they only run if the number of wagons is found sufficient). As there is no real constant timetable for goods trains, clients cannot rely on the railway operational system and there is no guarantee of a regular or just-in-time train service.

The carriage of single wagons and groups of wagons is realised by a hierarchical system of marshalling and shunting yards:

- The first level: the marshalling stations as well as the border stations, are connected by inter-marshalling yard trains.
- The second level: small shunting yards are subordinated to the marshalling stations. They have to form/split up primarily local freight trains to/from neighbouring marshalling yards.
- The third level: stations (including the private sidings connected with them) are subordinated to the stations with shunting yards. Transfer trains run between the stations and the shunting yards.

Rail services are divided into service areas (depending on the existing locomotive depots). Changing of locomotive crew is always done together with the change of the locomotive. This means there are no through-running locomotives (the depots are afraid of theft of spare parts by crews of neighbouring depots or by foreign crews). Additionally, changes are necessary in the connecting points between electrified and non-

electrified sections (e.g. in Dzhizak and in Berlik). The time for locomotive changing amounts to some 30 - 40 minutes (this includes wagon and load control operations carried out by a wagon examiner).

As there is no special system for containers, the traction is always organised between stations and not between terminals. As the traffic decrease, the necessary number of containers to form a special container train is hardly ever reached. Thus, containers are only running as normal single wagons or groups of wagons in normal freight trains, without any consideration of their logistical characteristics.

This rail traction operating system results in:

- irregular container freight forwarding,
- a much lower level of traffic on the main line,
- excessive wagon downtime at singular points along the route and at borders,
- high collecting times,
- high throughout time of wagons in the marshalling and shunting yards,
- no guaranteed short throughout times for fast goods in single wagons.

The current operational train services on the TRACECA main corridor is as summarised in Annex 11.

c) Railway-based Information Systems Related to Intermodal Traffic

The railways of Kazakstan, Kyrgyzstan, Turkmenistan and Uzbekistan have a real time computer program on the main frame in the central railway computer centre which is called "ASOUP" (automatic system of management of operating processes). These national systems are a part of the whole FSU's railway system "ASOUP". This system is connected with all marshalling and shunting yards which have also personal computers as terminals of the system.

The main basic document of this system is the wagon list message which includes:

- information about the train (e.g. departure station, destination station, train number, date and time of departure, length of the train, gross train weight),
- information about each wagon (e.g. place of the wagon in the train, wagon number, brass-bearing axle boxes or roller bearing axle boxes, destination station, kind of goods, number of containers but not the container numbers and tare weight),
- summary (number of axles in the train, number of loaded and empty wagons, net, tare and gross weight of the train and number of containers in the train.

The input in the system contains all information about the changing of the state of the wagons and trains:

i) loading/unloading,
ii) including/excluding of wagons in/out of the trains,
iii) departure, arrival or through run of a train,
iv) changing of locomotive crews.

Thus, the railways are able to locate every wagon in their own network. In co-operation with the central Moscow computer centre of the Russian railways or with the computer centres of the neighbouring railways they are also able to locate a car in the whole CIS-network. The railways or special small companies (partly subsidiaries of the railways or of the computer centres) offer a special tracing service to their customers.

The customers have to conclude an agreement with these companies, with the railways or with railway forwarders, which will give information about the present state of the wagon and of changes of the state.

Up to now it was impossible to locate a container because the number of the container is not included in the computer system. Thus, container operators or other clients could only get information about a concrete container if the number of the wagon where the container was loaded on was known. For this service at the Brest station as well as in Druzhba special forwarding agents looked on which wagon the client's container was to be unloaded. After this the tracing of the wagon with the container is not a problem. Difficulties might

arise in case of changing the container flat car on the way (in case of defect for example) or on-the-way-handling in a terminal (in case of different destination stations of the containers loaded on one wagon).

Now the CIS-railways are undertaking steps to solve this problem. In the 1997 autumn sessions of the Council of the CIS railways it is planned to create the organisational framework for the creation of a specialised container tracking and tracing system. Therefore it is planned to adopt a new document and data message concerning the exchange of containers on border stations and exchange stations between railway administrations including the numbers of the containers carried and some other additional information. The introduction of this system will be done step by step. Local experts in Kazakstan and Uzbekistan estimate that a minimum two years will be needed for the full implementation of the system.

A special situation has been met in Azerbaidjan and Georgia, where the above system was in the phase of introduction only when SZD broke asunder. Thus, a functioning computer-based tracking and tracing system for wagons and containers does not exist. These railways dispose of traditional manual systems based on documents, notes, phone calls and telex messages only.

The railways need a short-term resolution of this problem to be able to offer normal logistical services to their customers, especially for the owners of high-grade goods. For that purpose the railways have to create their own tracking and tracing system, which should include all points of potential changing of the state of the train:

i) the important transhipment points, that means the ports of Poti, Batumi and Baku,
ii) the border stations (Gardabani, Beyuk-Kjasik),
iii) the main marshalling stations concerned in the train formation along the corridor (e.g. Samtredia, Tbilissi sort., Baladzhary, Shirvan),
iv) some important intermediate stations (e.g. the Broceula/ Rioni/Kutaissi junction, Rustavi, Gyandzha);
v) stations important from the internal operational point of view (Sestafoni and Khashuri where the pushing locomotive will be coupled to or uncoupled from the train).

In general it would seem to be useful to install the overall CIS-system for wagon tracking and tracing, too. This will be necessary especially in the case of re-integration into the Russian railways network by re-opening the lines Ingiri - Sukhumi - Tuapse as well as Makhatchkala - Gudermes - Astrakhan (Russian Federation) for regular traffic (in case of a political solution to the crises in Abkhasia and Tchetchnia).

2.1.4.5. Container operations at Ports

The existing transport system concentrates on railway techniques. The port facilities for operating with container traffic have been largely underestimated because all consignments are on a direct delivery basis whereby cargo is loaded straight from vessels onto rail cars for immediate dispatch. There is no CFS shed (Container Freight Service) for stuffing/unstuffing « LCL containers ». Most of the available areas are dedicated to shunting rail wagons to/from ferries and only small yards are available for stacking « FCL containers ».

On the Caspian Sea, the ferry-wagon vessels (« Dagestan » type) belonging to the Caspian Shipping Company are efficient for carrying traditional wagon cargo. Handling operations from/to vessels are simplified. However, it must be noted that 35% of the shiploads are the dead-weight of the rail wagons. For a fully loaded ship of 2 550 Dwt capacity, only 600 or 800 tons of goods can be loaded.

Since insulated containers are carried on trucks or rail cars, there is no possibility to stack containers. This transport system makes the container an inefficient support in terms of capacity. On the other hand compared to wagons, container cargo must support a relative higher freight rate per ton.

The maritime transport of containers crossing the Caspian Sea is subjected to the same rules applied to general rail wagon traffic. The three vessels serving Baku-Turkmenbaschi achieve on average three round trips per week. However, there is not constant time schedule. The ferry leaves when full or when the ferry on the other side is leaving. The current ferries can load either 28 rail cars or 30 trailers plus 4 trucks and 150 passengers. If the wagons are carrying containers, the maximum capacity of the ferries is about 60 units. When only wagons embark, operations take about one hour (40 minutes for disembarking). Taking account of

time for embarking passengers and some idle time for administrative procedures, the call lasts between three and five hours.

As the cross Caspian traffic declined, the RO/RO ships and container-ships owned by the Caspian Shipping Company were chartered in other seas. It appears that within this system -which is becoming saturated[36] - the container traffic can not properly evolve, as the advantages both in terms of capacity and cost per unit of this support are not put to use (stacking, flexibility, lower dead-weight, easier organisation of empty returns, etc.). Such a situation restricts the expansion of container traffic and does not help to reduce the proportion of wagon freight which could be transported by container.

It is convenient to examine all the possibilities to make better use of the advantage of containers. This is by modernising the existing facilities, including the creation of specific container stacking yards and by making a greater use, within the current ferry system, of the stock of roll-trailers (container mover) in good condition which are available in Baku and currently totally under used.

In a second step, container traffic should better evolve outside the ferry system. The separation of container flows and wagon flows requires a minimum container traffic level to allow a convenient turn-over of handling and storage facilities. At present, container traffic is so low that it seems difficult to contemplate such radical changes in the immediate future. However, as soon as container traffic reaches a level of 3000 TEU/year, it would be convenient to examine other possibilities, such as using container-carriers which could be brought back to the Caspian Sea.

2.1.4.6. Documentary issues

For the practice of international transportation the following documents are, in general, necessary.

Administrative documentation:

- A set of bills issued by the client which are accompanied by a « list of content: goods description » commercial invoice, etc. These bills must in certain cases contain specific details as required by the country's administrative bodies, the sender or receiver.
- A « transport instruction note » made out by the loader who takes on, if need be, the obligations of the transport operator in the carrying out of his duties.

Transportation documentation:

A contract of transport: bill of loading, waybill, international transport document LTA . This transport document may be established for the whole of the journey or broken down into corresponding sections of the journey. These take into consideration the journey taken through each country and the mode of transport used.

Legislative documentation:

Upon leaving the country of origin, at each border crossing and at the moment of entry to the country of destination, the respective customs' administrations require the presentation of documents concerning the freight and the mode of transport used.

Financial documents:

In order to process certain means of international payment, the following documents are required:

- On the part of the forwarding agent: a paper vouching for the taking in charge of the merchandise, e.g. a « Through bill of loading » TBL.,
- On the part of the receiving agent: partaking in the obtention of certain methods of payment on receivership:

[36] Since 1993, cross Caspian traffic is increasing at a rate of 30% per year in the Baku-Turkmenbaschi direction and 20% per year in the opposite direction. If this trend carries on, saturation could appear within five years time.

* acceptance draft,
* bill of exchange,
* bank statement, (freezing of funds), etc.

In the TRACECA countries, apart from the sending of SMGS rail waybill or CMR[37] international consignment, the above procedures along with their corresponding documentation are not well known by the senders and operators. In part, all of these operations were previously carried out under the responsibility of the sales centre located in Moscow.

As described and analysed within the TRACECA Project « Trade Facilitation and Customs Procedures », border customs offices are not set up with uniform custom procedures and standard formalities. This causes long delays, which slow down commercial train speeds and increases travel time. Transportation operations are not facilitated by the current heavy procedures. The INCOTERMS are poorly understood (confusion between CIF and FOB). The implementation of a simplified paperwork package as proposed by the above mentioned TRACECA project would be welcomed and appropriate staff training would be essential.

2.1.5. Management and Marketing Aspects

2.1.5.1. Management Structures

The large Central Asian countries are the most land-locked countries in the world. Four of them are 1 500 kilometres from the nearest seaport. To Western Europe markets, distances involved can reach up to 10 000 kilometres. From Tashkent, the distances by land and by « pure » rail, are:

- 4 200 km to Brest;
- 4 000 km St Petersburg;
- 5 200 km to Chop;
- 4 985 km to Istanbul;
- 3 885 to Bandar Abbas;
- 4 230 to Odessa.

The export/import transport problems posed by their land-locked position, combined with the remoteness from main trade markets calls for specific transport solutions. Current alternatives are inadequate, involving high transport costs and poor quality of service (delivery time, reliability, safety etc.). These handicaps are obviously affecting the competitiveness of export/import and consequently trade development with Europe.

The multimodal transport alternative via the Caspian Sea (2 950 kilometres to Poti and Batumi) provides the possibility to shorten this distance by at least 1 000 km. The transit of goods through the TRACECA countries would mean that only these countries control all the transport cost, at least up to Poti. In principle, these two advantages are sufficient to compensate for the additional handling cost required to cross the Caspian Sea. A multimodal operating approach is the logical and attractive alternative to meet the customer's desires (low cost, good quality) and facilitate the international commercial integration of the whole region.

Multimodal Management Structures do not exist (see section 2.4.1.2. Organisational environment). The creation of a multimodal management system is one of the key issues of the present project. Specific recommendations and case studies have been prepared to achieve this objective. A case study on Multimodal management structure describes who is in charge of what in the field of multimodal transportation. The next Chapter on Recommendation for improvement of systems describe the different steps necessary to built a multimodal system in TRACECA countries.

[37] Convention on the contract for the international carriage of goods by road

2.1.5.2. Multimodal Cost and Tariff aspects

The available data is inadequate and it is therefore difficult to make cost comparisons between competitive modes and routes to evaluate the competitiveness of the TRACECA corridor.

The organisation of this part of the study is as follows:

a) the cost of multimodal transport,
b) the tariff of multimodal transport,
c) conclusion on cost an tariff aspects related to multimodal transport.

Guidelines for the reorganisation of multimodal tariffs will be discussed in the Chapter 3 of the present report.

a) The cost of multimodal transport

Multimodal transport has a cost structure in which components evolve mainly as a function of the tonnage carried and the distance travelled. The cost components to be considered are:

- trucking costs (end haulage by road from/to rail terminals),
- handling cost at each terminal within the considered route,
- rail traction,
- ferry related cost and maritime transport.

The end haulage by road from/to terminals has without doubt a cost more or less constant in terms of ton/ kilometres. Of course, this is only an approximation which would need to be fine-tuned for the small carriers. For larger carriers, problems such as using a supplementary tractor or organising collection of containers around main terminals (with a view to providing full employment of drivers and tractors), has a minor impact. This justifies the consideration of a constant cost by ton/kilometre.

As for the cost of handling at each terminal, this component decreases considerably as the tonnage increases due to more intensive utilisation of equipment and space and to improved performance of more powerful equipment. Economies of scale also arise from operating with a reduced number of terminals and handling equipment where activity is concentrated. According to various studies, handling costs would decline significantly up to the level of 2 500 - 3 000 TEU/month. Beyond this volume, marginal costs decrease more slowly.

As for railway transport, it is well known that the cost is closely related to the tonnage: the cost of a supplementary ton carried decreases as the tonnage increases. This is true in general, but even in a specific case, the transport cost per ton/kilometre of a full train is clearly much lower than the cost of an individual wagon, which is itself much lower than the cost of an isolated truck. This is true for rail transport in general and for multimodal transport in particular.

Finally, ferry related and maritime transport costs also decrease as the tonnage increases.

By regrouping these elements, one can conclude that the unit cost of multimodal transport decreases as the tonnage carried increases. The decreasing scale effect is more pronounced than for a pure railway service and even more so, for « door-to-door » pure road transport.

The transported tonnage however is not the only important parameter. The distance travelled is just as important. Indeed, the incremental cost per ton/kilometre (the marginal cost) is lower for rail than for road. If road transport is often preferred by the shippers in market economies, it is mainly because it allows « door-to-door » services with relatively short delays. In good conditions, multimodal transport is able to provide an equal quality of service and make the users benefit from the lower cost of rail traction, although it has to support additional handling costs. From a certain distance, multimodal transport will be as attractive

(economically speaking) as long distance road transport[38]. The distance, however, must be long enough to compensate for the additional handling costs at container terminals. In European conditions, it is estimated that the cost of multimodal transport becomes lower than road costs for distances greater than 500 kilometres. American studies situate the cut-off point of balance higher, at around 1 500 kilometres.

On the TRACECA route, two of the main theoretical requirements for developing economically viable multimodal transport are fulfilled, i.e. distances are much longer than the minimum required and there is a coherent rail network and handling terminal network. What appears to be the key issue is the capability of current operators to allow the system to generate lower costs than competitors, particularly road transport. This is mainly linked to the four following aspects:

- The number and location of handling terminals. The logic of combined transport is in the utilisation of a reduced number of aligned specialised terminals. In the TRACECA region, most of the 50 inventoried terminals do not urgently need to be upgraded. An increase in the number of specialised terminals in many different areas can only push up the unit cost of container transport. The higher the number of terminals, the lower the traffic activity per terminal. The resulting handling unit cost will be high, since the overall cost must be shared among fewer containers handled. In general, investments and capital immobilisation should be avoided as far as possible. The 20 selected TRACECA terminals form a suitable network for TRACECA trade purposes.

- The rail traction technique in use: currently, the rail traction operating technique is the conventional rail traction of dispersed traffic by individual wagons. This mean costly marshalling operations and low turn-over of wagons since such operations entail delays which increase the length of time during which the wagon is used. Whilst the terminal network and the rolling stock are certainly aged, it is above all the operational side which needs to be renewed. The renewal of the operating rail container system should focus on elimination of avoidable costs (marshalling, slow turn-round of wagons, etc.). There is a need to concentrate traffic activity on trunk routes where the freight potential available is such that block trains can be formed.

  Indeed, the consolidation by road transport of dispersed traffic should allow the setting up of direct bloc-train[39] serving only « key » terminals. This technique is clearly the most effective since it reduces marshalling operations and increases the period during which wagons are travelling with loads. Typically, the traction costs of individual wagons involved in marshalling operations cost about 60 to 70% more than for an identical wagon in a block train.

- The port container handling and maritime transport system: the existing system designed around rail transportation and horizontal transhipment direct from rail to ferry, results in containers being relatively inefficient in terms of generated unit costs per ton carried. Indeed, current vessels are not adapted to container traffic as ferry-wagons do not offer stacking possibilities. Within this system, containerised transport will have great difficulties in developing in a satisfactory manner. The renewal of port container handling and maritime transport should focus on the elimination of present constraints. The creation of container freight depots and the use of vessels adapted to containers (with stacking possibilities) should certainly enable unit costs to be reduced.

- Limiting partial loads and empty returns as far as possible: in long-distance transport, the availability of return cargo is a condition *sine qua non* for an economic operation of multimodal transport. Empty returns have a considerable impact on multimodal transport costs. Presently, empty returns are creating serious problems and results in a series of costs which could be avoided. The organisational adaptations for the acquisition of return cargo must be introduced as a condition to reduce present costs. This necessitates the modernisation of the logistics organisation and the quality of service of commercial operations. The nature of goods carried has lower importance.

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[38] The logic of combined transport is in the utilisation of the (cost) advantage due to economies of scales on a relatively long trunk distance with the advantage of road transport in the connecting transport. In terms of transport time, quality of service and costs, road transport is the main competitor and must be used as a reference.

[39] Transport between two distant terminals, a fixed timetable, no intermediate stopping or sorting, evolving in an integrated transhipment process with a container travelling between one point close to the producer and another point close to the customer.

By regrouping these elements, it can be concluded that the unit cost (ton/kilometre) of multimodal transport will be attractive if the tonnage carried increases and the operating technique is changed, namely by concentrating the traffic activity on the main TRACECA trunk route where the freight potential is such that block trains can be formed.

The minimum potential traffic level when adequate turn-over of the rolling stock and handling equipment in terminals for the container cargo ship can be developed is estimated at 50 000 tons/year in one direction. The achievement of such traffic volumes and its organisation through a multimodal approach should allow the reorganisation of the tariff policy arising from the lower unit costs generated.

b) The tariff of multimodal transport

As discussed earlier, the cost function of combined transport is quite specific. Combined transport is a separate mode of transport which generates costs evolving in a manner different from railways or road transport. The relative combined transport tariff should be based on this specific cost instead of being established by simple addition of amounts resulting from the application of successive mono-modal tariffs.

Currently, container service tariffs, in TRACECA countries, are obtained by simple addition of:

- An international railway tariff used on other routes different from TRACECA,
- Domestic railway tariffs applied for domestic runs following the last border point prior to the final destination,
- Handling tariffs at each terminal,
- Ferry-related costs (Caspian Sea) deducted according to wagon-related costs,
- Trucking tariffs more or less negotiated with the trucking company in charge of transporting containers to the destination terminal,
- Container provision in the terminal where the freight will be loaded.

All the services listed above are carried out and priced by different professionals (freight forwarders and modal carriers) who act individually. Such a situation can apparently ensure that individual interests are protected. However, this fragmented approach disrupts work flow, causes delays, creates costly overlapping and also confusion with customers and users. For example, an interviewed shipper complained about the lack of clear responsibility, the high freight rates and lack of transparence (it being impossible to itemise each transportation cost component). As a result they make little use of container transport. It is possible and necessary to integrate three or four of the different roles (forwarding, handling, provision of containers and even initial/final road transport) into one typical company dedicated to combined transport.

Container rail services are not currently priced on the basis of any specific system adapted to multimodal transport but are based on the conventional MTT rail tariff (transit tariff applied by the railways network under the Soviet influence). Within the former unified rail territory, the tariff system worked relatively well. Within the new political-geographical context, the use of the MTT system introduces distortions resulting from passage over different national rail systems. This raises, at least, two kinds of distortions: the « distance distortion » and the payload distortion.

- The *distance distortion* . For a train whose composition remains unchanged (same number of wagons and wagon payload), MTT variations related to distance have a substantial impact on the rate: the longer the distance, the lower the freight rate. When using the North route, through Russia, one benefits in full from the decreasing scale effect since the tariff system is applied over the same territory in one continuous run. When using the TRACECA route, the total reduction is disproportionate, since the same tariff system is not applied on the total TRACECA distance, but on a country by country basis (by addition of shorter successive sections). Freight rate reductions are consequently higher through Russia than those through TRACECA, obtained by adding the reductions that each different TRACECA railway can provide. From Tashkent to Riga (4 286 km), rail charges for a 20' container are $US 2 000 (0.47

$US/km). From Tashkent to Poti (1 700 km on rail sections), rail charges are equal to $US 1 650 (0.97 $US /km).

- The *payload distortion*. Freight rate MTT considers variations with regard to the wagon payload. The heavier the train, the lower the freight rate. However, the MTT is a rail tariff system and logically does not consider the logistical advantages of the container. It does not take account of avoidable costs resulting from the multimodal approach. Container traffic is priced without particular consideration of its nature which is quite different from conventional rail traffic. In such a context, the MTT tariff system discriminates against container traffic as compared with wagon rail traffic because for example, a train with 50 wagons can carry up to 2,500 tonnes, whilst a train carrying containers cannot carry more than 1,500 tonnes. The resulting cost per ton is too high to make the container alternative an attractive choice. Furthermore, rebates granted for certain types of traffic (i.e. export of Uzbek cotton) are based on tariffs where the cost per container always exceeds that per wagon. Other regular export commodities such as fertilisers cannot sustain such tariffs.

  Furthermore, the ratio of service offered to cost is such that it further contributes to maintaining a high level of wagon traffic which could be transported by containers. Besides, there is no « door-to-door » set freight forwarding tariff and each current participant draws its fee without any concern for what the customer should pay for a « door-to-door » service.

To evaluate the competitiveness of the TRACECA route as compared with competing alternatives, a specific survey was carried out. It consisted of establishing the breakdown of tariffs for each segment and then of a comparison of transportation tariffs for a 20' container of approximately 10 tons shipped from the Tashkent region to Paris (Valenton terminal) or Milan (Rogoredo terminal). Calculations are not based on negotiated tariffs. They are approximate prices based on data from various sources from Uzbekistan, Georgia, Italy, Switzerland and France. It is obvious that the market reality is different. However these tariffs are indications of the tariff policy implemented on the different routes or by the different transportation organisations. It helps to clarify the current situation. The result from the calculation, presented in full in Chapter 3, is summarised in the following table.

Table 19: Current Freight Rates

(for a 20' container weighing 10 tons between TASHKENT and Western Europe (US Dollars).

TASHKENT - MILAN		20 feet (10t)
VIA	CHOP	3040
	Riga	3920
	Bandar Abbas	4410
	TRACECA	**5590**
TASHKENT - Paris		
VIA	BREST	3170
	RIGA	3860
	BANDAR ABBAS via Mediterranean ports	4975
	TRACECA	**6150**

The table shows that compared with various competitive routes, TRACECA is not currently competitive in view of the high volume of sea freight shipped towards POTI. For a 20' container weighing 10 tons between Tashkent and Western Europe, the freight rate is approximately similar up to the different CIS Borders or even Bandar Abbas (about $US 2 500), although the distances are quite different (4 286 km via Riga; 4 761 km via CHOP; 3 100 km via Bandar Abbas and 2 000 km via Poti). This is mainly due to the impossibility for TRACECA container customers to benefit in full from the reductions resulting from the decreasing scale of the rate which could be applied on the total TRACECA rail system (and not on a national rail by rail system).

On the other hand, it is clear that the current operating system generates costs which are too high to be attractive, as compared with other alternatives. The resulting freight rates are so high that users often prefer to avoid this route and use cheaper alternatives (road or rail). This is one of the reasons why TRACECA railways are experiencing a significant decline of container traffic. Container activity is evolving towards an increasing deficit which could become persistent and would lead to abandoning multimodal activity indefinitely.

A well adapted tariff scheme is necessary. It should cover generated costs and provide profits enough to invest and develop the system. This necessitates application of a « single TRACECA tariff » on the total TRACECA distance, (not section by section) which should be considered as a single route and served by a block-train (Almaty-Poti). This requires the adoption of a multimodal approach, eliminating as far as possible marshalling costs, low turn-over and capital immobilisation in terminals. The suppression of avoidable costs should allow the tariff system to be reorganised so that freight rates will become attractive compared with road transport. This tariff reorganisation would allow freight rate decreases without loss of money since it is based on a cost reduction approach (renewed operating technique) and revenue increases (a new commercial approach which will revitalise container activity).

The risk taken is moderate. As conventional wagon-load business can not meet the contemporary quality of services demanded (« door-to-door »; short delay, « just-in-time » requirements), railways will continue to experience an inescapable decline in their wagon activity. The adaptation to a free-market economic system will decrease the market for full load train while the demand for more frequent smaller consignments will increase. As the recent experience of Central and Eastern European countries shows, the multimodal approach to container transport is the key to economic recovery of former Soviet Union railways companies.

According to a recent ECMT study[40], most of the recently created Eastern European multimodal companies who are members of the IURR reported satisfactory results in 1995. They are only dealing with International traffic which represents a rapidly growing market. The satisfactory performance reported in 1995 is reflected by the excellent results of the company Adria Kombi (Slovenia) where container traffic grew by 10% in 1995. The Hungarian company Hungarokombi managed to increase container shipments in 1995 by 74%. The volume of freight carried by the polish company Polkombi is growing by 49.1% a year since 1993. The Czech company Bohemiakombi is developing rapidly and increased its capacity this year. On the contrary, conventional wagon traffic in Eastern and Central Europe has suffered significantly decline between 1988-1994 (-55% in tons/kilometres).

On the other hand, results from the cost survey also shows that prices differ considerably between CIS exit points and the final destination in Milan or Paris. In particular, the current high maritime cost between Poti and the Italian ports reduces the attraction of the TRACECA alternative.

c) Conclusions on cost and tariff aspects of multimodal transport

Within the current tariff system, container traffic on the TRACECA route has great difficulties in developing in a satisfactorily manner. Current traffic remains flat (400 TEU/year) even if the freight traffic is expanding rapidly: conventional traffic is increasing at a rate of 30% in the Baku-Turkmenbaschi direction and of 20% in the opposite direction.

Only a small number of customers ask operators for container services because the current multimodal system is too complex. The tariff system is opaque and expensive and the service offered does not reflect customer needs (reliable door-to-door service with frequencies adjusted to their production process to avoid costly storage). As a result, up to 90% of the containers used for import operations remain idle or are sent back empty.

The present organisation seems unable to generate spontaneously an appropriate multimodal framework. Support from official authorities is essential since combined transport, a complex transport mode of collective interest, is heavy to develop and poses multiple constraints. Whilst the terminal network, rolling stock and road fleet are certainly aged, it is above all the operational side which needs to be renewed. The reorganisation of the tariff policy is only part of the problem. At present, the fact that railway production is not

[40] Trends in the Transport Sector: 1970-1995.

based on the concept of a direct container train crossing the border, prevents any type of tariff policy suitable for trains scheduled with a minimum number of wagons.

The results from the survey on costs shows that, in order to be attractive, serious efforts must be made to reduce transport costs on the Tashkent-Poti route. The estimated reduction to be considered is about 15 to 20%. To reach this objective, it is necessary to reduce three costs categories: rail traction cost; transhipment cost and maritime costs,

- *Reduction of rail traction costs*: As the TRACECA economies move closer to the profile of West European economies, their freight intensity will decrease. Rail will face absolute decline in demand from its traditional customers and will have difficulties compensating for this loss by competing with road for new traffic, for which quality service at moderate cost is important. While rail traffic will decline, rail's future role is in longer haul international traffic. Railways should focus on the multimodal market segment which presents a real opportunity for recovery. This requires the railways to change their strategy and become container carriers. TRACECA railways may take the risk of becoming merely retailers (traction and schedule providers). It is their interest to promote the independent commercial combined transport structures which should be able to gain confidence of forwarders, shipping lines and road carriers. All of them, along with the railways, represent the potential investors. Consequently, the creation of specialised combined transport companies must be encouraged to the high degree. A combined transport organisation is the only possible way to reduce traction cost and offer flexible services comparable with road services.

  On the other hand, the reorganisation of the tariff systems implies a larger co-operation between national railways first, and between TRACECA railways and European railways as a second step. It is essential that railways agree on a single unified TRACECA tariff system, which should be set up within the commercial framework at the national and at the regional level. The reorganised future tariff can not ignore the logistical advantages and cost savings introduced by the use of containers within a multimodal chain. Indeed, multimodal transport fits well with the overall logistical approach. Container can help shorten the logistical chain. They facilitate the programming of customers production since the content of containers is carefully delivered to the final point of destination.

  - *Transhipment cost:* the number of terminals to be upgraded must be, in a first step, the lowest possible.

  - *Maritime cost:* as for railways, Caspian Sea shipping line (Turkmenistan and Azerbaidjan) should pay greater attention to the multimodal market segment. This necessitates the upgrade of container facilities at ports and to bring back to the Caspian sea at least one vessel able to cope with the increasing demand for lower container freight rates to cross the Caspian Sea.

  In addition, there should be an effort to find agreement between railways and Shipping lines to serve Poti more regularly. This will depend on traffic and should encourage TRACECA countries to join their efforts to attain at least a minimum traffic level.

More generally, TRACECA countries need to reform their entire « trade logistics » regime if they are to compete successfully in the world economy where concepts such as « just-in-time delivery are increasingly important. Trade logistics embraces not only transport but handling, packaging, storage, inventory control, insurance, financial services and related information.

The guidelines for the reorganisation of the tariff system applied to container transport is presented in a further chapter, Chapter 3.

2.1.5.3. Marketing related aspects

Current participants in container freight forwarding have a poor perception of marketing techniques as a tool to increase sales. They just try, when asked, to meet the needs of freight forwarders or shipping companies which intend to use container transportation in Caucasian countries or in Central Asia. In most cases, the initiative comes from the customer himself. Operators have no elaborated marketing strategy. Customers usually require special tariff measures or a general rebate, in the form of commissions shared with an

intermediary company (i.e. Zheldor or "transit" subsidiary company of the railway networks as Azerail in Baku). However, certain national transportation intermediary companies which display a great deal of imagination and use innovative approaches (CAUTREX in Georgia, SHOHSTRANS or BK-INTRANS in Tashkent, KAZINTER FREIGHT or TERMINAL in ALMATY) gradually replace specialised railway departments and try to successively require lower tariffs from multimodal transportation suppliers as well as an increased quality of service.

2.1.5.4. Commercialisation and logistics

Container technology has been conceptually designed to prevent goods themselves from any manipulation during the transportation process. Only the « boxes » must be handled, and this is to be made from a place near the producer to a place situated near to the final consumer. A second condition for efficient container transport consists of using the boxes in both directions of a traffic flow. These two requirements mean that containers are efficient when used in « door-to-door » transport operations, between two regions exchanging balanced volumes of containers, in order to avoid excessive empty returns.

As a consequence, the use of containers implies that only two terms of sale can be efficiently applied : « Ex works » or « Free delivered ». The term « Ex-works » means that the buyer is responsible for the total transportation, from its warehouse or factory up to the final consumer. The term « Free delivered » means the opposite: the seller is responsible for all possible damages during transportation and must pay for all transport charges from his warehouse to the end-user's premises.

In the Europe --> TRACECA direction, the most common commercial practice is a direct relationship between a maker-seller and an end-buyer. There is no intermediary buyer, or when there is one, he is situated near to the final buyer. The first condition of efficiency for container transport is fulfilled ("door to door") and the choice of container seems to be judicious. The problem is that « boxes » often return empty, because in the TRACECA -->Europe direction, packing the goods in containers from a place near the sender up to the final user is not easy. For leading export products such as cotton, commercial practice often requires the services of an intermediary selling agent who is often situated too far from the final-user.

If the producer-seller knows the contents of the intermediary agent's order, he does not know the requirements of the final-user in terms of logistics: quality and quantity per type of product, size of parcel, frequency required, etc. As final consumers in Europe are used to manufacture on « just-in-time » process (to avoid costly storage), a reliable and time-adjusted transport delivery is required. Currently, the lack of reliability of the current TRACECA corridor combined with the poor adaptation of the storage facilities for containers are obstacles to the easy use of containers in this direction of the traffic flow.

Currently, the intermediary selling-agents prefer to buy on « FOB » basis (Free-on-Board) and tends to prefer rail-wagon transport solutions for the first phase of the transport as wagons offer a better loading capacity - therefore a lower cost per ton transported. They are also not in favour of containers for this phase because they need to reorganise the goods (unload the container) according to the requirements of the final buyer. From their warehouses, they proceed to sell on « free-delivered » and « just-in-time », by container.

If producer-sellers from the TRACECA region desire to introduce more efficient « free-delivered » container sales, they must re-adapt their logistics and storage policy in accordance with end-user requirements. This implies adapting the handling facilities at the factory premises, still mainly wagon-oriented, and improving the layout of warehousing facilities. In this case, the TRACECA transport companies will also have to make agreements with European companies particularly when organising end-haulage transport.

If the producer-sellers desires to introduce more efficient « Ex-works» container sales, it is necessary to clarify the relationships between the sellers and the intermediary merchants. They must also accept the real meaning of ex-work contracts which implies that the trader has total freedom regarding the choice of mode and conditions of transport. In this case, local companies should take part in the transport activity, under the responsibility of the buyer's chosen operator.

Despite the above mentioned difficulties, opportunities already exist. Up to 20% of Uzbek cotton, for example, could be containerised at the origin because the producer-seller is in direct commercial relationship with the end-user.

2.1.6. Summary of strengths and weaknesses of the existing system

Definition	Strengths	Weaknesses
Organisation	Some dynamic private companies are partially filling the gap left by the absence of specialised combined transport companies	Each participant has a mono-modal approach which excludes any type of collaboration with other partners. There are no independent combined transport operators capable of assuming the responsibility of organising international multimodal container traffic from the origin to the final destination.
Traffic		
From/to rail Terminals	« Regional Agreement on Transport Issues » (Uzbekistan, Turkmenistan, Azerbaidjan and Georgia) is expected to boost the traffic from Central Asia to Georgia.	In the Caucasian countries, the traffic from/to rail terminals is reported to be low. It is « unbalanced » ; Most containers must be sent back empty. In Central Asia, although the overall traffic is increasing, rail container traffic is decreasing dramatically at the present time.
From/to Ports	Turmenbaschi: commodities such as equipment, cotton, fertiliser and part of the metal products (ingots) are containerisable	But only 4000 tons are full container traffic (about 400 TEU, in 1995). The traffic via ferry terminals is more than three times higher than the traffic via piers. The ferries are carrying about 35 % of dead-weight.
	Baku: From 1993 to 1995, the total traffic from Baku to Turmenbaschi doubled. The nature of the traffic is evolving towards easier containerisation. The volume containerisable is at least 63 000 tons. (6 300 TEU).	The largest part of the traffic increase (100 000 tons) is passing by trucks (via ferry terminals). Less than 1% of the total traffic is containerised (About 350 TEU).
	Poti: from 1993 to 1995, the traffic increased to 1.6 million tons. Rapid containerisation process in progress: from 23 000 tons in 1992 to about 90 000 tons in 1995 (9 000 TEU)	Container traffic from Central Asia is very low: about 3% of the overall container traffic.

Technological Aspects		
Rail and Roads	In general, there are no major problems to organise special multimodal trains as container trains are normally shorter and lighter than normal heavy freight trains.	However, it must be noted that the Georgian section Sestafoni - Khashuri has a particularly steep gradient: 32% between the stations Kharagouli and Likhi. On this section, an assisting pusher locomotive is often needed.
Ports General		Rising level of the Caspian Sea. Problems with the rail tracks (from railways and cranes) not embedded into the ground make operations difficult.
Storage capabilities	Largely sufficient in Baku, even for a traffic of 10 000 TEU. 6000 m² in Poti.	The backup areas for efficient container operations have been seriously underestimated.
Handling equipment	Sufficient in Baku and in Poti.	In Turmenbaschi, the lifting capacity of the 6 existing cranes is insufficient for 20 foot container.
Vessel fleet.	The Caspian Shipping Company own two RO/RO ships capable of carrying up to 66 containers (equivalent to a 28 wagon container train).	These vessels have been chartered and operate out of the Caspian Sea. Currently, there is no RO/RO serving Baku-Turmenbaschi
Roads	Pavement is in acceptable condition. There are problems to organise the collection and deliveries by road from/to terminal.	
Rail container terminal	The number of rail terminals and their alignment (location), as well as the area of coverage, allows the practice of Multimodal transport.	Technical standards of main terminals are adequate for the handling of large containers. Critical Situation in Azerbaidjan: the Khyrdalan terminal must be reconstructed.
Rail wagons	Most of the railways (Kazakstan, Uzbekistan, Turkmenistan, Kyrgyzstan) have no problems to cover the demand for wagons for container traffic	Some problems to meet the maintenance requirements.
Truck fleet		Underprovided.
Container	The stock of 20 foot containers is large enough compared to the potential traffic. These containers comply with the international ISO-standards and other international rules for container traffic (e.g. CSC). Some local industrial chemicals companies have their own tank containers (Kazakstan), concrete data on this was not available.	The biggest problem with containers is their poor technical condition. Special containers such as open-top, open-sided, flats as well as tank containers and refrigerator containers are not available.
Pallets		Operators do not consider the use of pallets as a module/fraction of an ISO-container. This slows down the process towards containerisation.

Operational Aspects		
Road operations	Some dynamic private road companies are able to propose international container services. These companies are able to work together with railways, within a Multimodal approach to international container transport.	Customers have to make on their own arrangements to transport their freight to the destination point, using either their own trucks or those of a trucking company they selected and paid. A railway system exists, but has not been specifically designed to group and concentrate available freight in a given geographical area. As a result, empty containers, often remain idle.
Terminal operations	At the beginning of the chain, containers are directly loaded from the road chassis to the rail wagons.	At the end of the chain the operations of unloading from rail wagon to the road chassis are based on a very high proportion of transhipment via the storage area. This slows down the operations.
Rail operations	Railway staff have considerable experience of railway traction and train formation techniques.	Train formation for containers is subject to the same general rules, based on « operational target »: the trains run only when a pre-defined number of wagons is attained. Traction is realised by a hierarchical system of successive shunting operations.
Port operations	High level of skills.	Only via ferry: 35% of the load embarked is tare weight.
Documentary issues		No uniform border customs procedures, no standard formalities: long delays.
Marketing Aspects		
Tariff	Agreements on attractive container tariffs have been established within the project Trans-Caucasian Container Pilot Train.	Container traffic is discriminated because the standard tariffs exceed those applied by wagon loads (tariffs are expressed in monetary units/ton).
Marketing		Operators have no elaborated marketing strategy.
Commercialisation	About 20% of Uzbek cotton, the leading export product, could be sold on a door-to-door basis. This volume could be sent by container subject to some changes in the logistics (storage and handling at the level of the seller) and some improvement of the Black Sea ports (extension of warehouse areas), the volume of containerised traffic could be considerably higher.	Leading exports are generally sold « Ex-works » instead of « FOB ». Local operators have inadequate control of transport from origin to final destination.

3. PROPOSALS FOR IMPROVEMENTS

Despite a theoretical environment extremely favourable for multimodal container transport, in practice it has had great difficulties in gaining ground. This situation is rooted on the one hand, in the deficiencies on the supply side and on the other hand, in the particular characteristics of demand related to container usage.

As previously demonstrated, the deficiencies on the supply side exist at four levels:

- operational,
- organisational,
- commercial, and
- technological.

The technological deficiencies call for investments, especially in handling equipment The other deficiencies call mainly for technical assistance to:

⇒ conceive and implement a special container « block train » (renovation of operating techniques) to replace the more expensive "mono-modal" approach,

⇒ manage the container traffic flow along the whole chain through a multimodal approach (creation Intermodal entities),

⇒ elaborate a marketing strategy, including the reorganisation of the tariffs system.

To achieve this, it is recommended to implement simultaneously two related programmes:

1. A programme of technical assistance to create the basic conditions for the development of the multimodal transport system.

2. A programme of investments for the modernisation of the multimodal transport system:

    * Investment projects to re-adapt port container facilities
    * Investment projects to up-grade rail terminal equipment

The following sections describe these two different action programmes. A series of case studies, presented in last section of this Chapter, complement the Investment projects. This studies deal with the following topics:

* Multimodal Transport: a logical choice,

* Potential for Intermodal Transport: « Traffic Forecast »,

* Setting up a Multimodal organisation,

* Organisation of the Multimodal chain: Cotton movement,

* Presentation of the « Trans-Caucasian Container Pilot Train »,

* Setting up a special container train (schedule and frequency of services) and Advice on terminal infrastructure and handling equipment,

* Reorganisation of the container tariff policy,

* The integration of maritime ports,

3.1. Proposal to create basic conditions for the development of the multimodal system

3.1.1. Introduction

The present TRACECA organisation seems unable to generate spontaneously an appropriated multimodal framework. Indeed, combined transport is a complex transport mode, difficult to develop and posing numerous problems which need to be resolved. Whilst the technological system is certainly aged and calls for some modernisation, it is above all the operational and organisational side which needs particular attention.

The renovation of the multimodal transport system requires significant modifications to the current operating system which generates costs too which are high to be attractive compared with other alternatives. The significant decline of container traffic calls for cost reductions and new commercial practices to attract customers to container.

A renovated system must be able to cover generated costs and provide profits enough to invest and develop the system. This requires the adoption of a multimodal approach:

- to organise special container « Block-Trains »: eliminating as far as possible marshalling costs, low turn-over and capital immobilisation in terminals,
- to acquire an initial minimum traffic level to allow special « Block-trains » to be formed,
- to integrate three or four professions into one typical company to manage the system,
- to re-organise the tariff system on the basis of the specific costs generated by this new organisation.

The present proposal concentrates on the technical assistance actions necessary to assemble and create the essential initial conditions necessary to develop multimodal transport in the Region.

3.1.2. Objectives of the technical assistance

The objective of the technical assistance programme proposed in the following paragraphs is to create the basic conditions for the development of multimodal transport, without which any infrastructure investment programme would fail.

The proposed actions seek to overcome the organisational, commercial and operational weaknesses on the supply side. The existence of an appropriate framework will facilitate the management of investments for improving the existing system.

3.1.3. Description of the work

The technical assistance programme consists of two steps:

- Step 1: creation of favourable conditions to give rise to a minimum container traffic,
- Step 2: creation of a network of multimodal transport companies in the region.

3.1.3.1. Step 1: Creation of favourable conditions for multimodal transport

The Technical Assistance Programme incorporates the four following tasks:

⇒ Task 1: To define the minimum level of traffic available to amortise the operating costs,

⇒ Task 2: To identify and bring together all the partners involved in multimodal transport,

⇒ Task 3: To produce an "Operational Plan" for Transport, which specifies the role of each participant and defines working procedures.

⇒ Task 4: To implement the "Operational Plan" and carry out regular monitoring of progress.

Step 1 / Task 1: To define the minimum level of traffic available to amortise the operating costs.

A market study in each country will be carried out to fix the objective of the minimum traffic level. This will include specifying the types of products and initial volumes which could be shipped by containers in the TRACECA corridor. Targeted products and volumes such as cotton, tobacco, fertilisers in bags, metal in ingots, etc. must be examined from the demand point of view to evaluate and fix an initial containerisation traffic objective.

At this stage, support from the responsible public authorities is essential as the activation of the TRACECA corridor (a corridor of common collective interest) can only be successful if a minimum level of traffic necessary to amortise operating costs is reached: a volume of 1000 TEU/country/year[41] would be enough to conceive multi-group container trains from Almaty to Poti. This traffic corresponds to a 20 wagon container train, three times a week (that is 120 to 150 containers per week). It corresponds to a global volume of 50 000 tons (5 000 TEU/year) and should allow full use to be made of a container ship such as BUNIAT SARDAROV, which should be brought back to the Caspian Sea. With a capacity of 75 containers, this vessel is able to cope with the projected traffic without major problems. It must be noted that the political need will only be temporary. After initial revitalisation, the multimodal chain must develop on its own and to compete with other routes according to free market principles, based on the shipper's free transport modal choice.

Step 1 / Task 2: To identify and bring together all the partners involved in multimodal transport.

At present, each partner involved in international freight traffic has a mono-modal approach which excludes any type of collaboration and does not encourage customers and forwarders to use containers on the TRACECA corridor.

To overcome the present restrictive approach and organise the first container shipments through the use of multimodal techniques (combining the various partners' skills and tools), it is essential to create a "High Level Working Party" in each of the interested countries, consisting of representatives of the different groups involved in multimodal transport (Ministry of Transport, railways, road companies, forwarders, shippers and TRACECA experts). The aim of this working party would be to identify the conditions necessary to reach container traffic volumes of the order of 1 000 TEU per year and to specify the role of each participating partner.

The TRACECA experts should assist local partners in defining and launching the proposed working group and to define their respective role and future agreements.

[41] This is equal to 50,000 tonnes/year for the five Central Asian countries (or 5,000 TEU/year) corresponding to 30% of the present system capacity (and 6% of the whole potential traffic).

Step 1 / Task 3: To produce an "Operational Plan" for Transport, which specifies the role of each participant and defines working procedures.

A group of TRACECA experts (both local and foreign) working on behalf of the "High Level Working Party" should prepare an "Operational Plan" for transport. This plan must specify in detail the method of operation to be applied in order to reach the threshold level of container traffic along the whole TRACECA multimodal traffic chain. Preparation of this plan will comprise two tasks:

* Sub-task A: A market appraisal
* Sub-task B: A description of the operating methods (Operational Plan)

Step 1 / Task 3 / Sub-task A: Market Appraisal

Complementary to the study of the market carried out in TRACECA countries (Task 1), it is also necessary to survey the opinions of European buyers in order to better understand the commercial constraints and to adjust the operating methods in order to satisfy the stated desires of the two parties involved. It is a matter of knowing the position of seller and buyer to introduce sale terms such as « Ex-works » or « Free delivered » to allow « door-to-door » shipment by container. This should facilitate the creation of balanced traffic flows and the approximation of sales procedures. In principle, this should be beneficial for all the other exporting sectors of the economy. Conducted under the guidance of the "High Level Working Party", a TACIS marketing expert in Europe and a local expert in each TRACECA country should produce within one month a report on the traders' position in this respect.

Step 1 / Task 3 / Sub-task B: Definition of an Operational Plan

The local and TACIS European experts should prepare, within three months after the market survey, an "Operational Plan" that clearly specifies how the first container shipment should take place. This plan will include the following items:

- organisation of the shipment from and to terminals,
- definition of the conditions under which the railways make the transport rolling stock available
- organise the administrative aspects and transport documents
    - international transport contracts specific to multimodal operations
    - possibility of editing documents such as TBL-FIATA to facilitate international payments
- negotiate the tariff with the Shipping Companies and international railways (tariff, availability of transport means, choice of routes, documentation etc.)
- negotiate the conditions under which the empty containers generated by import flows can be used by TRACECA State exporters. This requires:
    - an inventory of the fleet of empty containers (type, number, location, etc.)
    - reaching agreement with selected large shippers and other main container users
    - finding a suitable financial agreement with the other TRACECA countries to make use of empty containers, where needed.
- establish co-operation agreements with the owners of containers,
- establish a « specification book » for the loading of containers and the certification of goods
- organise the transfer of responsibility along the entire combined transport chain
- assign a representative from the « High Level Working Group» for:
    - negotiations with the European railways administrations
    - organisation of the operations in all the transit and destination countries
    - locating transport correspondents
- establish commercial agreements with European shippers exporting to Central Asia and Caucasus in order to encourage them to accept the return of containers to Europe loaded with « targeted » products.

In the report to be produced, the official members of the « High Level Working Group » should clearly indicate the local container operator who will be in charge of setting up the traffic.

Step 1 / Task 4: To implement the "Operational Plan" and carry out regular monitoring of progress.

Once the "Operational Plan" has been designed and approved by the national working groups, a multi-lateral meeting should be organised in one of the countries of the region in order to establish a regional accord relating to three issues:

1. Shipment using a specialised multimodal train via the essential "key" terminals with a fixed train schedule coordinated with the "Trans-Caucasian-Container Train", and further with the Pan-European network (subject to case study),

2. The tariff policy to be applied to multimodal transport must be redefined (guidelines for such a redefinition of the container tariff policy » are provided in a further section),

3. A simplification of the paperwork and procedures is required. It should be based on the « Document Package » proposed by the project « Trade facilitation and Customs procedures ».

The first shipments should then be initiated and monitored by the same team of specialists. The problems encountered should be reported to the "High Level Working Party". They must decide, during a second multilateral meeting (if required) how to resolve them.

3.1.3.2. Step 2: Creation of a network of multimodal transport companies in the region

Once the technical and operational conditions are in place, it will be necessary to encourage the signature of partnership agreements between the various participants in order to create within each country truly independent multimodal transport companies.

A programme of technical assistance will include the two following tasks:

⇒ Task 1: The creation of multimodal transport enterprises at the national level,

⇒ Task 2: The creation of a regional multimodal transport network connected to the Pan-European network.

Step 2 / Task 1: The creation of multimodal transport companies at the national level

Particular technical assistance is required to create the multimodal transport companies (statute, organisation, financial management, definition of activities etc.) in order to assist the search for potential Western European partners who may be willing to invest in the capital of these enterprises.

The independent Multimodal Companies should be created for the sake of all current participants in container transportation. The general interest of the project and resulting productivity increases should be highlighted at the initial stage for the sake of the Railways, forwarding agents, major importers/exporters, potential customers, customs (and Ministries), road forums, etc.

In general, the role of the proposed company is similar to the European combined transport operators: a sort of "freight transport wholesaler" and combined transport organiser. A detailed description of the proposed multimodal organisation is proposed within the framework of the next section (Case Studies and Training).

In general, the companies' activities can be summarised as follows:

- to evaluate the transport needs of individual firms,
- to buy rail traction at favourable rates,
- organise initial and terminal road services (by sub-contracting, for instance),

- to resell multimodal services to individual firms on the basis of attractive retail prices.
- to have control over the efficiency of terminal services, through setting up actual multimodal transport operators in charge of co-ordinating the logistics involved in finding, loading, handling, and distributing available containers,
- to regulate arrivals and departures of containers loaded on the main terminals.

The benefits from its activity must allow the Company to reinvest and finance the supplementary infrastructure required: new terminals, handling equipment, nodal point management, etc.

However, initial investments must inevitably come from external sources of financial aid because the initial returns will inevitably be modest. The newly-created multimodal transport enterprises will be unable to provide sufficient levels of investment to finance these improvements during the initial years of operation (see Section 3.3: Investment Projects). In the medium to long term, as their activities increase, these enterprises will increasingly be capable of reinvesting the profits from their activities and should create, on their own, the required supplementary container infrastructure.

Step 2 / Task 2: The creation of a regional multimodal transport network connected to the Pan-European network.

It is envisaged that a true TRACECA Multimodal Transportation Union should be set up, which is able to integrate the inter-modal activities in an international community of interests at the TRACECA corridor level.

3.1.4. Composition of the team and assistance effort

The proposed programme required :

Step 1: Creation of favourable conditions for Multimodal Transport:

Task 1: Fixing an initial container traffic objective: 1 man-month of a TACIS marketing expert and 3 months of local experts per country,

Task 2: Identification of a multimodal partner and creation of a « High level Working Group »: 1 man-month of a Multimodal organisational expert and 3 man-months of local experts per country.

Task 3: Elaboration of an « Operational Plan »: 1 man-month of a marketing expert + 8 man-months of an operational expert. Local expertise is estimated at 18 man-month per country,

Task 4: Implementation and monitoring: 6 man-months of a TACIS operational expert and 18 man-months of local experts per country.

Step 2: Creation of network of multimodal transport companies in the region: These two tasks represent a technical assistance effort of 10 man-months. The team would be composed of legal experts, a management expert and a tariff specialist.

3.1.5. Expected output

The project implementation should result in the creation of multimodal management structures which will be capable of managing a regional multimodal network, connected with the Pan-European network, via the main TRACECA corridor.

3.2. Investment project to up-grade ports container facilities

3.2.1. Introduction

At the level of the Caspian Sea, the existing conventional system designed around rail transportation and horizontal transhipment direct from rail to ferry, results in containers being relatively inefficient both in terms of capacity and in terms of unit costs per ton transported. Within this system, which is currently on the brink of saturation with conventional traffic, containerised transport will have great difficulties in evolving in a satisfactory manner. There is an urgent need to examine different alternatives to give containerised traffic a real chance of developing in the near future.

Given that present traffic level is so low, this can be achieved initially by modernising the existing container facilities in all the ports. As a first alternative, general cargo crossing the Caspian Sea may be transported by block train or by truck within a renovated ferry-wagon system. As the container traffic increases, it would be appropriate to examine the use of other vessels and handling systems more adapted to containers.

The first alternative is being considered within the renovation and modernisation project prepared by the Consultant RAMBOLL (the TRACECA project « Renovation of the Ferry Terminals of Baku and Turkmenbschi »). Such a renovation which shall make maximum re-utilisation of existing facilities is described in detail in the «Phase 1, Final Report » produced in January 1997.

The investment project include, two other proposals which could be considered in a further step, once container traffic has increased to a level sufficient to justify the corresponding investments. It is a matter of bringing back to the Caspian Sea other vessels types such as a container-carrier or a RORO vessel.

In all cases, the renovation of ferry terminals implies the up-grade of the 20 selected rail terminals and renewal of rail operating techniques.

As for the Black Sea ports, the proposal presented below is to adapt the port of Poti to the increasing volume of container traffic. This may be achieved in the short term by creating a terminal outside the port and equipping it with appropriate handling systems, then by modifying the layout of the present yard as described in Section 2.1.3.3. (container port design). In the long term, it would be essential to build a new container terminal able to cope with the expected higher traffic level.

3.2.2. Reminder of main problems and issues at stake

3.2.2.1. The Caspian Sea Ports.

The traffic analysis shows that transcaspian traffic is increasing rapidly, but little use is made of containers. On the other hand, this analysis shows that a large amount of the present traffic can easily be containerised:

* foodstuffs, (including the refrigerated cargo), beverages, textile products: 90 %
* equipment (engine, electrical, electronics and mechanical equipment, household equipment, spare parts): at least 50 %
* chemical products: 30 %
* raw materials in ingots (copper and aluminium sheets and ingots for example)
* fertilisers in bags

These commodities represent, in the Turkmenbashi-Baku section, a traffic of about 90 000 tons. It must be added that about 50% of the ferry shiploads consist of trucks, some of these carrying containerisable products. As a result, it is estimated that the present cargo which could be presently containerised is about

100 000 tons. Besides the general cargo, there is an increasing cotton traffic: 100,000 tons from Uzbekistan. About 20% of this traffic can be immediately containerised. In total the potential containerisable traffic can be estimated at 10,000 TEU/year of general cargo, plus 3,000 TEU/year of cotton. This is for a total of 13,000 TEU/year. Today, only 1% of pure containerised traffic is registered (400 TEU/year).

The port of Turkmenbaschi presents majors drawbacks that largely explain this situation. The general cargo quay does not fit well with the requirements of the containers traffic. Out of the 70 000 m² of the platform, 1 320 m² are used for covered storage, 20 000 m² are occupied by the rail tracks which make the circulation impossible for trucks and mobile handling equipment. Only 20 000 m² can be used for storing and operating containers and other general cargo. However, the available area is big enough to operate with 10 000 TEU/year. As for the handling equipment capacity, the lifting capacity is limited to 10 tons, insufficient even for 20 feet containers. Furthermore, current freight rates are rather high because the base for calculating freight rates is the length of the vehicle, not the container, and almost all the containers are carried on rail cars and trucks.

As for Baku, the infrastructure presents some inconveniences, but there is no major problem with the handling equipment. The main complex pier (380 metres long and 200 metres wide, comprising 7 berths) presents a layout designed for direct transhipment from the ships to the rail cars. Because the rail tracks are not embedded into the pavement, only 2 hectares out of the 8 hectares of the mole, are available for open storage and truck traffic. On the Western side of the mole, there are two cranes of 40 tons capacity which are suitable for containers. If 1,5 hectares of the platform was dedicated to the containers, 10 000 TEU/year could be handled easily provided that some rehabilitation is carried out. Possibilities of extension exist so that the pier could cope with a traffic of 30 000 TEU. The covered storage are in poor condition.

The traffic on the Caspian Sea has been rapidly growing during the last three years (20% per year). If the recent trends carries on, the ferry fleet capacity (which for the three vessels is about 650,000 tons) could be saturated in five years time. However, it must be recognised that the total ferry fleet capacity, is much higher (if one includes idle vessels, up to seven wagon-ferries could be put into service). On the other hand, traffic forecasts produced by RAMBOLL within the « Renovation of the ferry terminals » estimates that in average, the cargo will grow above 10% per year and thus will not reach the pre-restructuring cargo flow levels until well into the next century.

It is therefore, desirable to start the renovation which shall make maximum re-utilisation of existing facilities. However, if spectacular recent traffic trends are confirmed and cargoes succeed in shifting to container (if «Container special TRACECA Block Trains are formed), it is conceivable to set up an independent system for containers and trucks and leave the wagon-ferries in service only for conventional traffic and passengers.

3.2.2.2. The Black Sea ports

The ports of POTI and BATUMI are the points of transfer of goods imported and exported from/to Southern European countries. They are consequently the outer door of the TRACECA corridor and are submitted to the constraints of the international requirements of the shippers and ship-owners.

The problem is different as compared to Caspian Sea ports which are only inner ports. They are only submitted to the constraints of the national shippers and ship-owners of Central Asia and Caucasia. (Although there is a possibility to organise shipping lines directly from the Caspian ports to the Mediterranean Sea via the Volga/Don Canal). The problem is that this route is closed during the winter season and the limits of the draught make the freight rates high and the reliability too low.

In POTI, the present container yard has five major drawbacks:

1. The total area is too small to cope with the short term expected container traffic . The total area of the platform is 17 000 m² but only 6 000 m² are available for the handling and storage of containers. According to ship agencies located in POTI, the traffic in 1997 will be 200 containers per week or 10 000 pr year (excluding the cotton traffic which is scheduled for 1997, i.e. 30 000 tons or 2 500 additional TEU). Altogether, in 1997, 12 500 TEU are to be handled in POTI. If cotton traffic is confirmed, by the year 2000 an additional volume of 8 000 TEU will be handled. Allowing some spare capacity, it is reasonable to conceive a container terminal able to cope with a traffic of 30 000

full and empty TEU per year. On the basis of a waiting time of one week in the yard, the necessary area for storing and handling the containers is about 15 000 m²; if the containers stay two weeks in the yard, 30 000 m² will be necessary.

2. The layout does not fit with the requirements of a container terminal. The area is congested by a network of railway tracks that make operations difficult or impossible because the trailers and tractors cannot get across from one end of the yard to the other. Moreover, the rail tracks are not embedded into the pavement, which prohibits the circulation of trucks. Normally, the railways network must be located in the rear of the terminal so that operations are not hindered by trains, and the tracks of the cranes are embedded, which allows the circulation of the handling equipment.

3. The handling methods are not convenient for containers. The direct delivery from the ships to the rail cars is a very long operation which reduces considerably the productivity rate to 4 or 6 containers per hour or 50 containers a day. Normally, 30 metres from the apron of the quay must be free of any superstructure except the quay cranes. This space is used for block storage and for the circulation of tractors and trailers which pick the containers up alongside the ship and bring them onto the stacking area at the rear of the terminal. It is more practical to separate the handling function of loading / unloading and the functions of storage, delivering and reloading on rail-cars. That allows the ships to operate non-stop and consequently reduced call times.

4. The handling equipment is insufficient. The cranes exist, are working correctly (though in poor condition) and have a sufficient lifting capacity (40 tons and a floating crane of 100 tons capacity). However, their status is poor and replacement of the quay crane is necessary as soon as possible.

5. The container terminal is also used by RORO vessels. There is competition for the same space between the container traffic and RORO traffic, which creates traffic jams on the terminal. The two sorts of traffic must be separated.

3.2.3. Objectives of the ports investment projects

3.2.3.1. The Caspian Sea ports.

The wider objective is to readapt the port infrastructure to respond efficiently to the shipper's specific requirements: better container shipping conditions and lower transport costs.

The specific objective is to up-grade port facilities and maritime transportation to stimulate general cargo to shift from wagons to containers. Three alternatives could be envisaged:

1. transport of a « container block-train » within a renovated ferry-system,
2. separation of container and truck traffic from conventional wagon traffic and carrying insulated containers by using a RORO vessel;
3. separation of container and truck traffic from the conventional wagon traffic and carrying insulated containers by using a container-carrier vessel.

In all cases, the alternatives must be able to cope with container and/or lorry traffic as smoothly and economically as possible. To be economically viable, the corridor, must not be more expensive than competing routes.

3.2.3.2. The Black Sea Ports.

The wider objective is to adapt this port to the increasing volume of container traffic:

* Immediately: to decongest the port of Poti
* Short term: to modify the lay out of the terminal to cope with container traffic of 25 000 TEU
* Medium term: to increase the capacity to 50 000 TEU and open the possibilities of extension up to 100 000 TEU/year. This is by transferring the Container terminal to the "finger pier".

To achieve this, it is necessary to create immediately a terminal outside the port. A terminal of about 10 000 m² must be created outside the port and must be equipped with a reach-stackers (45 tons lifting capacity). This is to be carried out even if the CAUTREX project of creating a terminal of 300 TEU capacity is confirmed,

For the medium term, before the year 2000, it is necessary to modify the layout of the existing container yard. In a further step (within 10 years) the container terminal should be transferred to the "finger pier" which is presently used for berthing idle ships. This area could serve as a container terminal while the present container yard is left to RORO traffic only. Such changes would result in a terminal of 20 000 m² with possibilities for further extensions.

3.2.4. Description of the port investments.

3.2.4.1. The Caspian Sea ports investments.

Alternative 0: Transport of « container block-train » within a renovated ferry-system,

This alternative is considered as the priority option since the renovation and modernisation of the ferry-terminal project shall make maximum re-utilisation of the existing facilities and reduce project costs (including rail and road connections) as far as possible.

The description of this alternative is provided in the Phase 1, Final Report (Design Phasis) produced by the Consultant RAMBOLL in January 1997. It is not considered necessary to reproduce the project description in full. However, a brief overview of the project with special emphasis on the container aspects is presented as below.

Staying within the economic planning period (to the year 2015), the main planning features are for each terminal:

Number of vessels:	7 (the existing ferries are only 10 years old. There is no need to replace them before the year 2020).
Number of berths:	2
Berthing time:	max. 4 hours (aiming at 2 hours)
Railyards:	remain as existing but modernised
Area requirement: loose trailer yard	5.6 hectares (excluding rail) of which about 2.3 hectares is container and

The planning of the ferry terminals shall take into account future development strategies allowing extensions of the terminals to match future traffic development beyond the present planning period of 2015.

A brief description of the works needed is as follows:

In the Port of Baku

In spite of the drawback of the terminal location, a reallocation of the ferry terminal has not been subject of the « Renovation of ferry terminals » project because of the desire to reduce the cost of the renovation by making a maximum re-utilisation of the existing facilities. The central location as well as the need to maintain the ferry system adjacent to the main port are also considerations which favour the present location.

The ferry terminal area is very limited (2 hectares excluding the areas occupied by the railway) and is heavily occupied by buildings and installations. Even if the existing terminal area is liberated of buildings, additional land area has to be found for the planning and implementation of proper facilities for the envisaged future terminal operations. This will require important reclamation works or moving of the fences to the general cargo port or adjacent areas. In all circumstances, existing structures (piers, quays and tanks) will have to be removed.

The access rail lines shall be maintained in the same position only subject to lifting in case there is a general raise of the level of the terminal area. The railway shunting/marshalling area will remain the same although minor adjustment may be introduced to save space. Access roads to the ferry are not considered suitable due to the inclusion of the road to existing warehouses, not allowing any expansion. In this connection, the port is considering the acquisition of the open area just north of the fly over bridge adjacent to the port area.

Contrary to the other alternatives, maintaining the present horizontal transhipment will not require supplementary vertical handling systems such as gantry cranes. The use of the ferry terminal will ensure the smooth and safe transfer of the various traffic categories (ferry traffic, rail traffic, car and buses and intermodal transport of containers on flat-wagons), between the ferry and the respective land traffic connections.

The traffic handling activities of the ferry terminal will integrate an intermodal handling and stacking in the terminal area. It will comprise:

- Reception and registration: reception area with road and rail access
- Container stacking yard (10,500 m² or a net area of 8,100 m²) for unloading/loading and intermediate storage of the containers waiting for crossing/delivery. The average stacking height is 2 containers. It is contemplated that no stripping of containers will take place in the terminal. Special collecting yards for empty containers should be established elsewhere e.g. by the individual operators. The average number of containers to be stored, assuming an average dwell time for containers of 4 days, is estimated to be 307 TEUs).This can be accommodated in an area of 8,100m².
- Unloading and stacking: mobile toplift loaders (cap 30t)
- Embarkation: mobile toplift loaders with spreaders (20' and 40');
- Trailers/container mover (exists already)
- Loadmasters/tractors: type - 200 HP

In the Port of Turkmenbaschi

In Turkmenbaschi, the remote location of the ferry terminal allows room for expansion both on land and by reclamation without significant interference with neighbouring facilities. Maintaining the location of the ferry terminal will allow maximum re-utilisation of existing facilities to reduce costs.

The ferry terminal area amounts to approximately 8 hectares of which only part is being used. If required, some extension to the west will be possible and to the south there are no known limitations to reclamation of additional new land areas.

The access rail lines shall be maintained in the same position only subject to lifting in case this will follow general raising of the level of the terminal area. The general raising of the surface level of the terminal area will entail lifting of the railway tracks in the shunting/marshalling area. This occasion will be utilised for adjusting the layout of the tracks in order to provide more space for use by other terminal facilities. However, the general positioning of the yards are expected to remain the same.

The land base for ferry ramps is anticipated to be in good condition. However, the steel structure of the ramps needs new corrosion protection and some minor steel profiles should be replaced. However, the condition of the wooden deck is very bad and dangerous for vehicles. Marshalling areas for trucks are unpaved and located at a very low level. Land works are required. The access track is very like the arrangement in Baku terminal.

Contrary to the other alternatives, maintaining the present horizontal transhipment will not require supplementary vertical handling systems such as gantry cranes. The use of the ferry terminal will ensure the smooth and safe transfer of the various traffic categories (ferry traffic; rail traffic; car and buses and intermodal transport of containers on flat-wagons), between the ferry and the respective land traffic connections.

Required investments for the renovation of ferry terminals :

Independently of container traffic considerations, the renovation of both ferry terminals is required in all cases to meet at the lowest possible cost the current traffic demand for the current and future cross Caspian traffic where container traffic, presently non-existent, will take some time to reach a high level. On the other hand, the ferry terminal renovation project integrates the development of container traffic and contemplates all the facilities at both ports terminals as an essential component. The required investment as well as the economical and financial viability of the project will be made available by RAMBOLL within the coming weeks. It should be noted that the EBRD has already expressed interest in providing a loan for the renovation of both the ports of Turkmenbaschi and Baku.

Alternative 1: Using a RORO Vessel

Two other possible alternatives for container transport crossing the Caspian Sea can be considered. Both are based on the principle of separating container traffic (and even truck traffic), from the conventional wagon traffic. However, as the current container traffic is so low, these new alternatives cannot immediately be considered as the priority option.

The first alternative consists of using one of the two RORO vessels belonging to the Caspian Shipping Company (capable of transporting 33 trailers and 105 TEU). This solution has the advantage of being able to accommodate, with containers, the growth of truck traffic (which constitute 40-50% of ferry traffic). The existing ferry wagons are also better able to accommodate conventional traffic.

A RORO cargo ship is less expensive to operate than a wagon-ferry because the capacity is higher and the vessel is lighter. A RORO ship can be used not only to serve containers but also the increasing truck traffic. This has the advantage of completing with the shipload by combining the two different types of traffic so as to optimise the occupancy rate of the ships. Indeed, a ROAR ship avoids the waste of space compared with rail cars and there is no need to bring back empty rail cars on the ships and pay unnecessary freight costs.

If adopted, this alternative implies (in addition to various restoration works to ground surfaces in order to allow for the circulation of trucks and fork-lift handling vehicles) the construction of a RORO ramp at the port of Turkmenbashi as well as bringing back to the Caspian Sea, a RORO cargo vessel type "Kompositor Kara Karaev" of 125 metres length with a capacity of 84 Kamaz trucks or 33 trailers and 66 containers TEU. This ship is able to serve the Turkmenbashi / Baku line once every two days. It will be put on line as soon as the works for dedicating one wharf of the two ferry terminals to RORO cargo ships will be completed.

A description of the works needed is as follows:

In the Port of Turkmenbaschi

On the general cargo terminal, it is necessary to:

* to built a steel ramp-pontoon to berth the RORO ship,
* to rebuild the pavement of the platform,
* to fit in the rail tracks of the cranes and those of the railways system,
* to purchase three reach stackers for loading containers on the rail cars, trucks and trailers as well as for stacking the containers on two levels,
* to purchase two tractors for moving roll-trailers.
* to locate the railways station at the border of the terminal in order to leave the space between the quay apron and the sheds totally empty in order to facilitate the circulation and the handling operations as well as the storage and stacking of the containers,
* to suppress the first range of sheds in order to create space for storing the containers.

On the ferry terminal, it is necessary to:

* dedicate one wharf to the traffic of cars, trucks and trailers. For that purpose, it is required to surface the pontoon bridge with steel sheets or at least take out the rail tracks of the railways so that the loading operations can be eased (this solution can only be temporary),

* to prepare an area for turning the trucks and trailers, just beside the access to the pontoon.
* to create space for parking the trucks waiting for the embarkation and set up services (toilets, food market for the drivers, etc.).

In the Port of Baku

On the main complex, it is necessary to:

* to reorganise the layout by keeping two berths (350 metres) on the western side of the mole, where there are the two cranes of 40 tons.
* to get rid of the three cranes located on the second range of cranes on the side of the shed C5.
* to clear the front part of the mole where there is the RORO ramp so that circulation is easier between the container and the RORO terminals. These two parts of the main complex will constitute the multimodal terminal of at least 2 hectares. The railways tracks will be fitted in the ground to allow the circulation of the mobile handling equipment.
* to use the remaining space on the western side as a parking area for trucks waiting for at the ferry terminal. This solution can only be temporary and should last as long as the container traffic remains low.
* to shorten the elevated quay up to the C5 shed in order to facilitate the operation of the RORO vessels.
* to create a link road between the main complex terminal and the ferry terminal so that the multimodal terminal is easily connected with railways, roads, RORO cargo ships and ferry boats.

On the ferry terminal, it is necessary to dedicate one wharf to the traffic of cars, trucks, trailers and containers on roll-trainers. If containers and trucks/trailers are carried on RORO cargo vessels, their handling will take place in the RORO terminal of the main complex, that is to say directly on the proposed multimodal terminal. If the traffic of general cargo increases on the main complex and there is a need for open storage space, the western side of the mole will no longer receive the rail cars, trucks and trailers queuing for embarkation. In this case, it would be necessary to find a place for the vehicles outside the port borders.

Summary of the required investments.

Nature of the Investment	**Port**	**Cost in US dollars**
Infrastructure	Turkmenbashi	4 500 000
	Baku	4 500 000
Handling equipment (RORO ramp)	Turkmenbashi	1 000 000
Total		10 000 000

Alternative 2: Using a container ship.

The RORO alternative appears to be an interesting short-term solution because present container traffic is quite low and truck traffic is increasing. However, if the intention is to develop an efficient multimodal transport system in the longer term, the use of a container-ship is certainly a much better solution. A container-ship is especially designed for containers and generates operating costs lower than a RORO vessel, enough to compensate the double handling expenses at the inner ports.

It is perfectly conceivable to bring back to the Caspian Sea a cargo vessel type BUNIAT SARDAROV belonging to the Caspian Shipping Co. This ship has a capacity of 75 containers TEU and the speed is 10.5 knots could operate three times a week between Baku and Turkmenbashi. On this basis, it should provide a capacity of 11 250 containers westbound and 11 250 eastbound.

If this alternative is adopted, the investment required to facilitate the vertical transhipment of containers as well as the following works must be contemplated:

In the Port of Turkmenbaschi

The general cargo berth has been built at an elevation of about 2,60 meters above the current water level so as the berth can be operated with no special difficulty in spite of the general sea level. Investments in infrastructure and equipment of about 10 million dollars are required:

* to modify the platform by embedding rail tracks into the pavement, clear the buildings and locate the railways at the rear of the platform. The cost of these works amounts to approximately $US 4.5 million.

* to purchase new handling equipment:

- Two quay cranes of 40 tons capacity:	$US	4 million
- Two reach stackers of 40 tons capacity:	$US	1,2 million
- Other handling equipment:	$US	0,2 million

Port infrastructure in Baku:

Works for an amount of $US 4,5 million are required:

* to redesign the layout by keeping two berths (350 metres long) on the western side of the mole where there are the two 40 ton cranes,
* two hectares will so be created and dedicated to the containers,
* to clear all the other superstructure and equipment,
* the railways tracks will be embedded so that circulation is made easier,
* the railway tracks located alongside the warehouses will be kept and embedded,
* the pavement will be reconstructed.

As a minimum, it will be necessary to purchase two reach stackers and tractors/trailers. The cost of this handling equipment amounts to $US 1.4 million.

Summary of the required investments.

Nature of the investment	**Port**	**Cost in US dollars**
Infrastructure	Turkmenbashi	4 500 000
	Baku	4 500 000
Handling equipment	Turkmenbashi	5 400 000
	Baku	1 400 000
Total		15 800 000

3.2.4.2. The Black Sea Ports Investments.

Three investment categories are required: immediate, short term and medium term.

Immediate Investments to decongest Black Sea Ports

Two investment measures must be envisaged:

1. to create a terminal outside the port in order to avoid the congestion of the terminal by the storage of the boxes. CAUTREX has already taken such an initiative by creating a terminal of 300 TEU capacity; it is to be encouraged. But, another terminal of about 10 000 m² must be created outside the port and it must be equipped with a reach stacker of 45 tons lifting capacity. The average cost of such an outside terminal is about $US 650 000. Additionally, $US 600 000 are required to buy a reach stacker.

2. on the container yard, inside the port, it is necessary to:

   ◊ replace two quays cranes with a lifting capacity of 40 tons at 15 metres. The cost is about $US 4 000 000.
   ◊ purchase 2 reach-stackers for the port container terminal of POTI in order to accelerate the handling operations. The cost of such equipment is about $US 1 200 000.
   ◊ purchase 3 tractors and trailers for shifting the containers from the quay side to the storage area, and stacking them. The cost of this handling equipment is estimated to $US 200 000.

Short term Investments on Black Sea Ports

Before the year 2000, two investment measures must be envisaged:

1. to modify the lay out of the container terminal:

   ◊ To keep only two quay cranes along the apron of the quay,
   ◊ To embed the rail tracks into the pavement,
   ◊ To clear all the superstructure on the 17 000 m² platform and build, at the rear of the terminal, two railways tracks to serve the domestic network.
   ◊ To save this area.

2. In addition to the previous works and equipment purchased on the very short term, the cost of the rehabilitation of the terminal is about $US 2 million (infrastructure).

The handling equipment previously purchased will then operate in this new terminal (two reach stackers and 3 tractors and trailers). The capacity of such a modified terminal could be about 25 000 boxes. The problem is that there is no possibility of extension. So, this solution can only be temporary and the terminal, as now, used for containers as well as for RORO traffic. It must be noticed that this terminal has no available area for a CFS or for a cotton storehouse.

Medium term Investments on Black Sea Ports

Within 10 years, two additional, but « step-by step », investment measures must be envisaged.

As a first stage, investment will allow the transfer of the Container terminal to the "finger pier" and leave the present container yard to the RORO traffic only. This project is promoted by ship-owners. It consists of using the finger pier named "passenger terminal" which is presently used only for berthing idle ships. The projected new terminal of 20 000 m² will have the possibilities of further extension. Moreover, by using transtainer for handling on the stacking area, the capacity of the terminal could attain about 50 000 TEU. Another advantage of the location of the container terminal on the finger pier is the possibility to build, if required, warehouses for cotton and one CFS close to the terminal on the Southern mole.

Secondly, if the traffic increases to 100 000 TEU, the terminal capacity must be doubled by widening the finger pier on the southern part.

The cost of the first step (to move the container terminal to the finger pier) is as follows:

* clearing of the superstructure and new infrastructure including roads and embed rails tracks for cranes and rail cars: $US 2 000 000,
* equipment : 3 cranes; 5 reach stackers and tractors/trailers as well as small equipment and spare parts: $US 10 000 000. It must be noted that costs may be reduced by $US 4 million by transferring the two cranes from the present container yard to the new one.

After this construction, the present container yard will be used by RORO vessels without any additional investment. It must be noted that the alternative of shifting to the finger pier could be implemented earlier, by the year 2000, if the RORO traffic increases. Otherwise, it could be impossible to manage the handling operations of RORO vessels and container-ships at the same time, in the same area.

The second step is far into the future to estimate the required investment.

Summary of the required investments.

Nature of the investments	**Period**	**Cost in US dollars**
outside terminal	immediately	650 000
1 reach stacker	immediately	600 000
2 quay cranes	immediately	4 000 000
2 reach stackers	immediately	1 200 000
other	immediately	200 000
rehabilitation of the platform	year 2000	2 000 000
SUB TOTAL first step investment		8 650 000
shifting of the finger pier	up to 2005	2 000 000
handling equipment	up to 2005	6 000 000
SUB TOTAL second step investment		8 000 000

3.2.5. Expected benefits

3.2.5.1. Expected benefits on the Caspian Sea Ports.

In order to provide a rough estimation of the expected benefits resulting from the implementation of the Alternatives 1 and 2, the Alternative 0 is used a the reference. The investment considered for a rough calculation of the economic viability only include the additional investment in handling equipment.

Alternative 0

From the shippers point of view, the use of the wagon-ferry « Dagestan » type, where containers are carried on rail cars, on trucks and roll-trailers implies:

- high stowing factor (35% of the total weight is dead-weight),
- every ferry is able to achieve on average three round trips/week in each direction. The maximum capacity, that could be available for container traffic is 50% of the total capacity of the ferry (28 wagons). This is 28 TEU/trip or 84 TEU/week (about 8 000 TEU/year, both directions included)
- According to the information collected during interviews with local ship owners, the daily cost for such a ship amounts to $US 8 000 per day or about $US 2 880 000/year/ship. This represents a unit cost of $US 360 (the current freight rate in practice is $US 400/TEU).

Alternative 1:

A RORO ship of the type of « Kompositor Kara Karaev » has a capacity of 70 trucks or 80 roll-trailers and 60 TEU. The annual capacity can be estimated at 20 000 TEU pr year. The daily cost is about $US 2 500 per (all costs included). This is about $US 0.9 million per year plus $US 0.12 million for bunker. On the basis of 10 000 containers/year, the cost per container is estimated at $US 102. Cost of double handling from rail cars to roll trailers has to be added (about $US 40). The total is about 142 $US /TEU.

On the positive side, compared with a ferry-wagon, a RORO ship would also carry trucks which is a factor of flexibility in the case of low occupancy rate due to low container traffic. Given the importance of truck traffic, this could contribute maintaining freight rates as low as possible. On the other hand, the use of such a ship, in parallel to the ferry system, would alleviate the problem of returning empty wagons due to the unbalanced character of the traffic.

In conclusion, the option of separating container and truck traffic from the conventional wagon traffic could be interesting as soon as the container traffic reaches a sufficient level to provide full employment of such a vessel type. However, further cost-benefit studies should be carried out to analyse in which condition such a vessel could again operate and demonstrate, with more accurate data, the financial viability of this operation taking account the investment required as well as the minimum traffic. Very roughly, for a traffic of 10 000 TEU/year, the possible reduction of transport charges could attain about 50% of the current freight rate.

Alternative 2.

A dry cargo ship type BUNIAT SARDAROV could carry more containers at a faster speed (capacity is 75 containers TEU and the speed is 10.5 knots). This vessel could operate three times a week between Baku and Turkmenbashi and carry a maximum of 11 250 containers westbound and 11 250 eastbound per year. Supposing that the average shipload would attain 50%, (to take account of the unbalanced character of the traffic flow), the annual capacity could be about 10 000 TEU/year.

The daily cost of this container-ship is, according to the time charter rate presently in force, $US 2000 a day. For one year, the annual cost is $US 730 000. The bunker expenses will be $US 750 per round-trip or $US 112 500 per year. Globally, the annual cost of the operations will amount to $US 850 000. For a traffic of 10 000 TEU/year, the average cost per TEU could be $US 85. Adding the doubled handling costs at each of the two ports, ($US 18 per operation or a total of $US 72), the total cost per unit is then estimated at $US 157 (compared with the current $US 400/TEU for the ferry-wagon system).

On the basis of 10 000 TEU annual traffic, which is the immediate potential traffic, the annual saving would be equal to: 190 $ X 10 000 TEU = $US 1.9 million. In this case the investment (only handling equipment is considered) would be reimbursed in 8 years.

These calculations, based on a traffic level of 10 000 TEU/year should be refined to demonstrate with more accuracy, the potential cost reductions which could be generated by using a container-carrier ship.

3.2.5.2. Expected benefits on the Black Sea Ports

The benefits essentially result from the reduction of the ship call time by at least 50 %. This has at least three advantages:

1. time savings for containers: on average $US 20 per container (based on containers-ship capacity),

2. the reduction of waiting time of the ships. Indeed, the improvement of the handling operations reduces the berthing time of the ships and consequently the occupancy ratio of the berth. It avoids the ships queuing up (when there is only one berth, it is demonstrated that the queuing time is 10 % of the call time as soon as the berth occupancy ratio aims at 44%). If there was no improvement of productivity, it would be necessary to build an additional berth for coping with the traffic in 2000 or 2005 when the traffic will attain 30 000 boxes. Such a berth would cost at least $US 5 million without the equipment. On the base of a 25 years life time of the berth, the annual saving is $US 0,2 million.

3. The operations of the RORO vessels will be improved and the productivity will at least be doubled. For the time being, there are 50 RORO vessels a year. Only for this traffic, the saving would be 4 000 $ per ship call, i.e. $US 0,2 million per year.

Summary of the expected benefits (in the case where the finger pier is equipped by the year 2000)

Advantages in $US 1000.

YEARS	1997	1998	1999	2000	2005
TRAFFIC					
- TEU	10 000	12 500	15000	18000	30 000
- ROROSHIPS	50	60	80	100	120
Containers time savings (20 $/TEU)	200	250	300	360	600
Ship time savings				200	200
RORO productivity gains				400	480
TOTAL	200	250	300	960	1 080

The first step of the investment amount to $US 8.7 million and will be reimbursed in about 8 years. Further cost-benefit analysis is required to demonstrate with accuracy the financial viability of the project which could be shorter taking account of the general improvement of the productivity which will be beneficial not only for container traffic, but for all traffic categories.

3.3. Investment project to up-grade rail terminals

3.3.1. Introduction and background

The FSU railways operated about 240 container terminals. About 50 of them (excluding terminals for medium sized containers) are located in the TRACECA region (20%). About 20 rail terminals are directly located on the main TRACECA corridor.

Most of the railway terminals in the region are concentrated in Kazakstan (about 40%) and in Uzbekistan (about 25%). Smaller countries such as Azerbaidjan, Georgia, Kyrgyzstan and Tadjikistan, have generally two container terminals.

Existing terminals are located nearby all capitals of the TRACECA countries and the most important industrial regions and large cities in Central Asia. The area of influence of the average « key » terminal[42], has an average radius of 250 km which is quite satisfactory taking into consideration the specific economic and demographic conditions in the region.

The identified « key » terminals are coherent enough in terms of East-West connections. Therefore, there is no need for new cope with current demand. However, in the long term some of the terminals without possibilities for future enlargement may have to be removed to more convenient locations within the same economic area.

The main problem with the existing terminal network is related to their poor technical standards, which can be described as follows:

Terminal Layout:

- There is no possibility for a full direct train (normally composed of 20 flat wagons), to enter into the terminals: most of terminals have insufficient length of tracks under the crane, limited to 10-12 flat wagons. Direct entry or departure into or out of the loading tracks by train locomotive is also impossible. Therefore, these restrictions make it necessary to shunt part of the train from/to the neighbouring station or marshalling yard by shunting locomotives.

- There are only one or two (mostly very short) tracks under the crane and only one loading lane for lorries under the crane/cantilever. This restricts efficient terminal technology on the interface with road traffic.

- Terminals are often encircled by different railway facilities and tracks. This restricts the possibilities for future extension (e.g. Tbilissi Tov., Bukhara 2, Almaty 2, etc.).

- The available storage areas under the crane are not paved and those outside the crane area often have pavements in poor condition. Damaged pavements obstruct the use of mobile reach stackers and container handling lifts.

- The roads connecting the terminal are in poor condition, even in the well-equipped terminal of Shumilova.

- Auxiliary facilities and equipment are often missing or in poor condition: fences, illumination, gate-houses, administrative buildings, office and communication equipment, etc.

Terminal handling equipment:

- Most of the terminals are equipped with cranes with lifting capacity of 20 or 24 t only (a very small number of cranes able to handle 32 t). At present about 40 or 50% of existing terminal cranes are out of operation.

[42] This is the area within which road transport should operate to concentrate container traffic flows around its related « key » terminal.

- Some very small terminals such as Gyandzha (Azerbaidjan) or Samtredia (Georgia) are equipped with two cranes with a very limited lifting capacity only 10 tons.

- Handling of 40 foot containers requires the use of 2 cranes or other temporary solutions (use of heavy mobile cranes or use of railway-based recovery cranes). The terminal at Shumilovo (Shqshtrans), the only terminal equipped with modern container handling front lifts and spreaders, is able to lift 20' and 40' containers and to stack them on 3-4 levels.

- To handle 40 foot containers, an automatic fixing of the containers is not possible: there are problems of adjusting the spreaders. Telescopic spreaders with folding grapple arms or simply gears for lifting of swap bodies are notably lacking.

If the question is to conceive an attractive and competitive multimodal network based on the notion of « specialised multimodal train » with a fixed train schedule and coordination with the "Trans-Caucasian-Container Train", there is need to up-grade some of the terminals, especially those located on the main TRACECA corridor.

According to their geographical position and their conditions, the « Key » terminals for upgrading must be classified by order of priority (High priority, Priority, Low Priority and No priority) as follows:

Poti Port	Priority from point of view of serving traffic along the TRACECA corridor (point of unloading Sea/rail or road. The development of the port container facilities as proposed within the present project must be enough to serve domestic traffic by road as well as transit traffic.
Samtredia	No priority. Domestic container traffic can easily be concentrated by road using the Poti container terminal directly.
Tbilissi	Low priority (priority will be increased in the event of expansion of Georgian economy). It should serve the separation of traffic to/from Armenia, (at present integration as stopover in the Transcaucasian Logistic-express train).
Gyandzha	No priority.
Baku	Priority. The proposed re-adaptation of the container sea terminal must be considered high priority as it is a destination point for the Transcaucasian Logistic-express (at present at Kishly station) as well as a transfer to/from the ferry link (for transit traffic). As for the pure domestic traffic, the alternative of using the port terminal is rejected by the authorities for environmental reasons (the port is too close to the city centre). The Consultant considers that the Kyrdhalan terminal is heavily damaged and is not very well located. A new terminal must be reconstructed in another more convenient location, no far from the Port.
Turkmenbashi	Low priority from the point of view of serving domestic traffic. However, the proposed re-adaptation of the port container terminal has to be considered with High priority as it is a transfer point to/from the ferry link. It should also serve domestic traffic.
Nebit-Dag	No priority (traffic can be organised via Turkmenbashi)

Obezberdy Kuliev	Priority (although present traffic volumes are very low). However, it should be included in future developments as it is the most important freight generator centre in Turkmenistan (Ashgabat)
Mary/Chardzhev	Low Priority. However, one of the two terminals must be selected as a separation point for traffic flows to/from Tashauz/Nukus and/or Serakhs/Meshed
Bukhara/Navoi	Low Priority. However, the level of priority could be higher if cotton is concentrated in Bukhara (as projected) and carried by containers. In this case a new container terminal will be required in Bukhara (High priority)
Samarkand	Low Priority. However, the alternative of using it as a separation point for container traffic to/from Southern Tadjikistan could be considered instead of Tashkent. In that case: Priority.
Dzhizak	No priority. Traffic can be concentrated in Shumilova (Tashkent).
Tashkent (Shumilova)	High priority. It is, in the opinion of the Consultant, the best possible separation point for traffic flows to/from the Fergana Valley. However, Samarkand could be an alternative option for this separation.
Tchimkent/Dzhambul	Priority. Efforts must be concentrated in one of the two terminals. The Kazak MOT prefers Tchimkent, which is the more important economic centre.
Tchu	No priority from the point of view of local freight generation. However, the priority could be higher if it is used as a separation point for traffic flows to/from Northern Kyrgyzstan and for some central regions of Kazakstan (Akmola). The terminal could be an interesting alternative point of freight concentration to/from the regions of Dzhambul/Tchimkent and Kyrgyzstan. However, it implies very long road transport distances.
Almaty	High priority.
Druzhba	Priority as it is a point of origin and destination for traffic flows through the main corridor and trade exchanges with China. No priority from the point of view of local/Regional freight traffic.

Neighbouring regions to be connected to the main TRACECA route.

Armenia	Low priority, via Tbilissi
Tashauz/Nukus	No priority, via Mary/Tchardzhev
Southern Tadjikistan	Priority, via Samarkand
Fergana Valley	High priority, via Tashkent or Samarkand

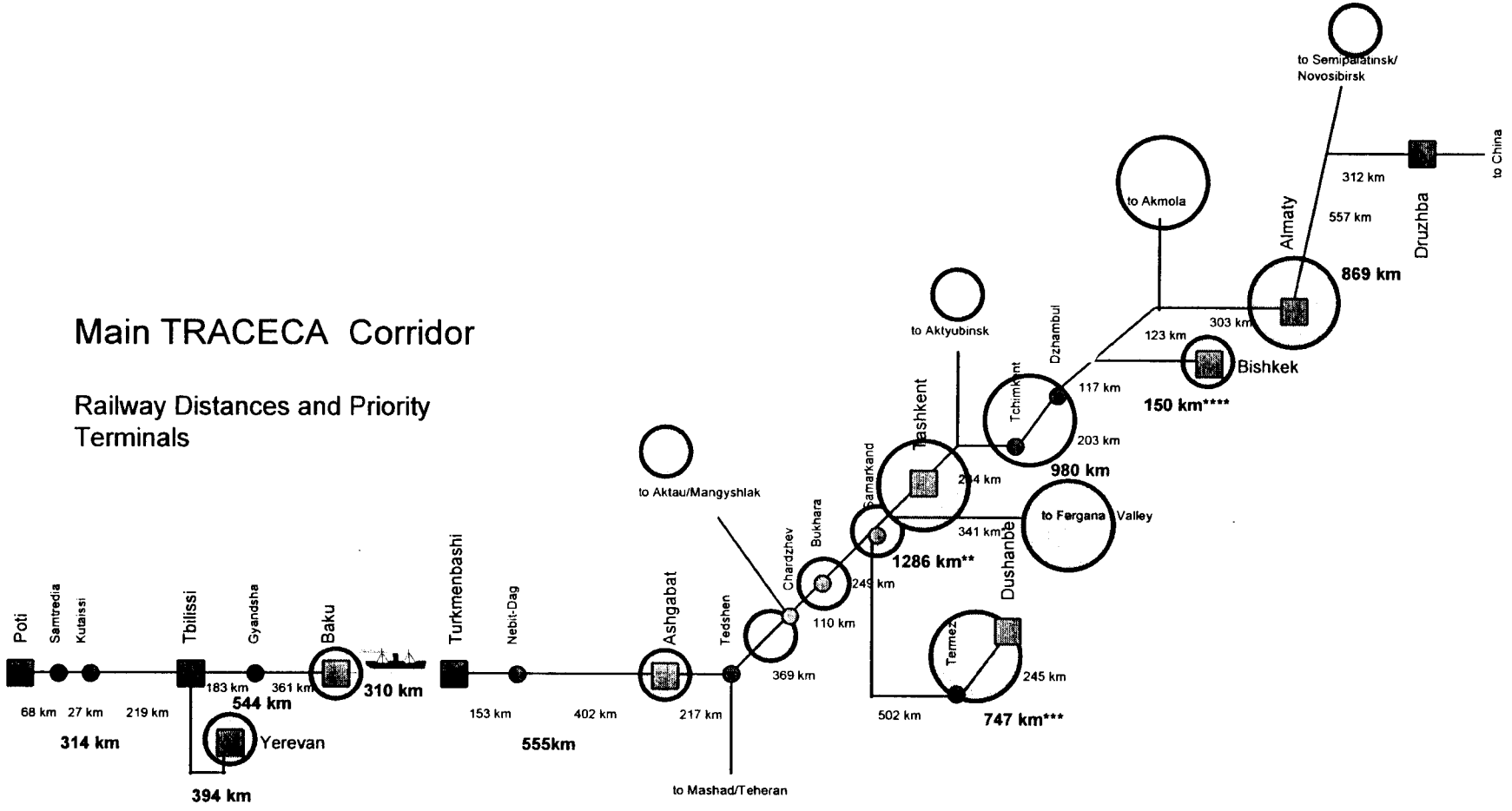
Northern Kyrgyzstan	Low priority, via Tchimkent/Dzhambul, Tchu (Lugovaya) or Almaty
Akmola/Karaganda	Priority via Tchimkent/Dzhambul, Tchu (Lugovaya) or Almaty

As previously emphasised, the final decision on terminals to be up-graded requires intensive supplementary discussions with the administrations responsible for transport policy and infrastructure development, but just as important, with the clients/forwarders. This is particularly true in Baku where there are several alternatives (reconstruction of the Khyrdalan terminal or construction of a new terminal at another site closer to the city, or even using the installations of the port). To a lesser extent, the suggested idea of concentrating container traffic in Tchu is to be discussed taking account of the alternative terminals: Bishkek, Tchimkent or Dzhambul. The consultant believes that, taking into consideration the comparatively long road distances between Tchu and the potential clients in Kazakstan and Kyrgyzstan, the concentration in Tchu does not seem to be the best choice.

The following chart summarises the « Key » terminal network to be upgraded, classified according to the level of priority.

Main TRACECA Corridor

Railway Distances and Priority Terminals



* via Dzhizak - Dustlik - Dzhetysaj - Syrdarya
(the distance via Dzhizak - Khavast - Yangier - Gulistan - Syrdarya is 376 km

** via Dzhizak - Dustlik - Dzhetysaj - Syrdarya
(the distance via Dzhizak - Khavast - Yangier - Gulistan - Syrdarya is 1321 km

*** from Samarkand

**** from station Lugovaya

Tacis

3.3.2. Objectives of the container terminal investment project

The wider objective of this investment i project is to improve and increase the capacity of transhipment of large containers at a target number of terminals located on the main branches of the TRACECA corridor.

These investments must be seen as part of a global multimodal transport approach whereby all the different multimodal elements are considered within the context of the system as a whole. It would be a mistake to invest large sums of money in multimodal transport, without ensuring the creation of the necessary conditions for its successful development. It is therefore essential to install an adequate structure for the management of multimodal traffic as well as carrying out the required infrastructure investments.

The specific objectives are as follows:

In the short/medium term:

- to enable the railways to meet the requirements of clients and forwarders for handling multimodal transport units,
- to strengthen the position of the railways in competition with direct road transport,
- to re-establish necessary facilities damaged in recent years.

In the longer term:

- to modernise parts of the terminal network by re-building or constructing new terminals according to western standards.

3.3.3. Description of the projected investments

In the short and medium term, the project will involve investment in:

1. reach stackers or container handling lifts with spreaders for 40 foot containers (one per terminal in the short term, in the medium term two per terminal),
2. repair of one crane per terminal and equipping them with modern spreaders (where not yet available) to lift 20 foot containers (as a reserve in the case of damage to mobile equipment),
3. paved surfacing of the storage areas,
4. other works (repair of fences, illumination, communication, repair of administrative buildings etc.).

Parameters and costs of short and medium term investments

a) Reach stackers:

It is recommended to equip Terminals with reach stackers (instead of container handling front lifts such as those operating in Tashkent). Indeed, these are the best technological equipment to handle containers offering possibility of lifting containers from wagons on tracks obstructed by one row of containers and the possibility of fixing containers from a diagonal position. However, the final decision would depend on local conditions (especially on the dimension of the storage area) of each terminal.

Technical parameters:

- stacking capability: 3-4 containers (sufficient for rail terminals),
- lifting capability: up to 40 t (first level), 27 to 31 t (second level),
- Investment: approximately $US 0.45 - 0.5 million per unit (incl. Spreader, without transport cost.

b) Spreaders:

Technical parameters of modern spreaders:

- automatic fixing,
- mobile for handling of 20' and 40' containers (telescopic motion about 30 seconds),
- able to handle trailers and swap bodies (incorporating folding grapple arms or with easily detachable bottom lift arms),
- up to 35-40 t lifting capacity

Investment:

- standard version approximately $US 50,000,
- detachable bottom lift arms approximately $US 30,000,
- heavier spreader versions approximately $US 85,000,
- high level spreaders with incorporated folding grapple arms, approximately $US 175,000 (not necessary in short term)

c) Terminal upgrading

The calculation of the investment volume for terminal upgrading per terminal is based on the average condition of visited terminals (detailed on-site investigation on a case-by-case basis will be required).

Table 20: Average costs for terminal upgrading

Measure	Sum, Thousand USD		Remarks
	minimum	**maximum**	
Improvement of the storage area and the driving lanes (pavement)	31	41	
Improvement of the access road	33	53	on terminal territory only
Reconstruction of the administrative building	38	94	
Reconstruction of the gate house	1	1	
Repair of illumination	7	9	
Laying of cables	55	109	
Upgrading of railway tracks	16	28	on terminal territory only
Replacement of switches	6	11	on terminal territory only
Repair of fences	15	26	
Repair of crane and procurement of spare parts	56	197	very broad estimation
Computer equipment and auxiliary equipment	13	19	incl. fax and modem
Subtotal	**269**	**589**	
Others	27	59	10 %
Planning costs	21	45	7 %
Total	**317**	**693**	

The investment volume might be lower for terminals in relatively good condition (e.g. Shumilova) but higher for terminals which are heavily damaged (e.g. Baku-Khyrdalan)

Thus, the average costs of terminal reconstruction vary from $US 0.3 to 0.7 million $ per terminal (excluding reach stackers and improvement of access roads). For comparison, the Azerbaidjan railways carried out a study concluded that the reconstruction of the heavily damaged terminal in Khyrdalan would cost approximately $US 1 million.

Total short and medium term investment

In accordance with the above defined priority of the terminals, total investment will be required as follows:

Table 21: Total short and medium term investment

	Average cost per unit	Total investment
Short Term Investments		
Terminal upgrading [43] minimum 8 terminals: Tbilissi, Baku, Obezberdy Kuliev, Tashkent-Shumilova, Tchimkent/ Dzhambul, Almaty, Akmola / Karaganda, Fergana valley (one terminal)	0.6	4.8
Procurement of reach stackers (minimum 6[44]) and spreaders	0.6	3.6
Subtotal		8.4
Medium term Investment		
Terminal upgrading minimum 6 terminals: Mary/Chardzhev, Bukhara/Navoj, Samarkand (Ulugbek), one terminal in Armenia, Bishkek, Southern Tadjikistan	0.6	3.6
Procurement of reach stackers and spreaders	0.6	3.6
Additional procurement of reach stackers for key terminals (minimum 5)	0.5	2.5
Subtotal		9.7

This calculation does not include the upgrading of sea port terminals (Poti) or the creation of port container facilities at both Baku and Turkmenbashi ports. The construction of a new container terminal for cotton handling in Bukhara is also excluded.

The total short and medium term investment (upgrading and procurement of handling equipment) amounts to approximately $US 18.1 million.

Long term measures

The investments in short and medium term will enable the railways (or other terminal operators) to meet the present demand requirements and will re-establish necessary facilities to revitalise container activity. However, they are not sufficient to meet future requirements or overcome all the general bottlenecks and technological problems arising from the existing terminal layout (insufficient number and length of tracks, poor access to rail and road networks, lack of space for future development etc.).

These fundamental problems can only be solved by new construction or by general reconstruction of the existing terminals (including enlargement). These far-reaching decisions might be taken only when the traffic activity has reached a minimum daily handling volume about 200-250 TEU. At present the maximum daily volume in the largest terminals amounts to only 25-30 TEU per day.

[43] terminal upgrading costs do not include improvement of access roads, this measure is not to be financed by a special terminal upgrading programme

[44] in Shumilova and Almaty 2 already procured

Construction of new large terminals western standards incorporating 700 m track length and with 4 tracks includes:

* preparation of terrain,
* connection with the railway and road network,
* parking areas,
* auxiliary buildings and administrative buildings,
* installation of a minimum of 3 high performance cranes,
* entry and exit tracks, etc.

Additional technical and technological requirements for new terminals are:

* cranes should be able to handle 30 units per peak hour,
* for large terminals 700m track length under crane should be guaranteed (placing of a full train),
* tracks should be installed in a straight line with no curves,
* additional storage areas outside the crane track area should be served by reach stackers,
* possibility of direct entrance and exit of trains from/into the long haul railway network should be provided (without involvement of shunting locomotives),
* broad range of different auxiliary services should be provided (e.g. container repair, container packing, logistical services, storage of goods etc.).

Long term investment for new construction are estimated to be at least $US 20 million per terminal (if new construction) or up to $US 10 million (re-construction of existing terminals). Detailed feasibility-studies are required.

At present, there is no need for such far-reaching investments as the existing traffic volume is far below the required minimum. The potential sites for long term terminal construction are Tbilissi, Tashkent (enlargement of Shumilova including the area of the neighbouring old terminal), Tchimkent/Dzhambul, Almaty, Akmola. A special case is Baku, where new construction might be necessary in the medium term if the authorities, the railways as well as the freight forwarders decided to abandon the reconstruction of Khyrdalan terminal as recommended by the Consultant (due to its inappropriate location). This requires additional on-site investigations and decision making.

3.3.4. Expected benefits

The benefit from the short and medium term investments essentially results from lower maintenance costs of the reach stackers (in comparison with the older soviet cranes requiring major repairs or replacement), and from the reduction of handling times and consequently, the reduction of staff and rolling stock downtime.

These investments along with the necessary improvement of terminal management and renewal of operating techniques are a condition *sine qua non* to allow the railways (as partners of multimodal companies) to compete with road for this new market segment.

The return on investments depends on the activity of the terminal. With respect to the existing high potential traffic, these short and medium term investments can be considered as relatively small. If the managerial operational and organisational aspects are improved effectively at the same time, there are no serious reasons to doubt the increase in traffic which will result and consequently on the productivity gains generated by the project.

3.4. Development of the Terminal Network in Kazakstan

3.4.1. Introduction and Background

Kazakstan is the largest country of the TRACECA region and the biggest exporter by volume. The existing container network in Kazakstan consists of 21 terminals, representing 40% of the available TRACECA region terminals. Kazak terminals cover the main industrial and population areas including the present capital Almaty and the future capital (Akmola). Other important centres are also served by the network: Aktyubinsk, Atyrau, Dzhambul, Dzhezkazgan, Karaganda/Temirtau, Kzyl-Orda, Koktchetav, Kustanaj, Pavlodar/Ekibastus, Petropavlovsk, Semipalatinsk/Ust-Kamennogorsk, Taldy-Kurgan, Uralsk, Tchimkent. Four of the terminals (Almaty 2, Druzhba, Dzhambul, Tchimkent) are located on the main TRACECA corridor. The main problem is that none of them has specialised equipment for handling large containers. This restricts the expansion of trade and its integration with the rest of the world.

The essential multimodal network covers 16 regions. « Key » terminals have been determined as follows:

Table 22: Kazakstan « Key » terminals

Area	Terminals[45]	Number of containers in 1995 (TEU) (incl. medium-sized containers)			
		per year	per month	per week	per working day
Akmola/ Karaganda	Akmola, Karaganda, *Agadyr, Zhana-Arka, Osakarovka, Temirtau, Aksu, Atbasar, Yermentau, Maj-Kuduk*	3 000 - 5 000	200-300	50-100	10-20
Aktau/Mangyshlak	Mangyshlak	1 000 -1 500	100-150	20-30	5-10
Aktyubinsk	Aktyubinsk	2 000 -3 000	200-300	30-50	5-10
Almaty	Almaty 2, Taldy-Kurgan, *Almaty 1, Sary-Ozek, Ush-Tobe, Otar, Tekely*	> 5 000	< 500	< 100	
Arkalyk	Arkalyk, *Derzhavinskaya, Dzhaksy, Yesil*	300-500	< 50	< 10	< 5
Atyrau	Atyrau	500-1000	50-100	10-20	< 5
Druzhba	Druzhba (no data for local shipment)	500-1000	< 50	10-20	< 5
Dzhezkazgan	Dzhezkazgan, *Karazhal*	300-500	< 50	< 10	<5
Koktchetav	Koktchetav, *Novoishimskaya, Volodarskoye, Suly, Tajntcha, Makinka, Kzyl-Tu*	500-1 000	50-100	10-20	< 5
Kustanaj	Kustanaj, *Amankaragaj, Dzhetygara, Mailin*	1 500 - 2 000	100-150	30-50	5-10
Kzyl-Orda	Kzyl-Orda, Tyuratam	500 - 1 000	50-100	10-20	< 5
Pavlodar/ Ekibastus	Pavlodar Yuzhn., Ekibastus, *Pavlodar, Yermak, Yermak Gruz., Shtcherbakty*	1 000 - 1 500	100-150	20-30	5-10

[45] Medium-sized container terminals are printed in italics

Semipalatinsk/ Ust-Kamennogorsk	Semipalatinsk, Zashtchita, *Ayaguz, Konetchnaya, Korshunovo, Neverovskaya (Russia), Shemonaikha, Leninogorsk, Serebryanka, Zyryanovsk*	2 000 - 3 000	150-200	30-50	5-10
Tchimkent/ Dzhambul	Tchimkent, Dzhambul, *Arys, Turkestan, Zhanatas, Karatau*	3 000 -5 000	200-300	50-100	10-20
Tchu	*Tatty, Lugovaya, Kuragaty, Tchu, Sary-Shagan*	300-500	< 50	< 10	< 5
Uralsk	Zhilayevo	500 - 1 000	50-100	10-20	< 5

3.4.2. Objectives of the terminal investment project

The wider objective of this investment project is to improve and increase the capacity for transhipment of large containers at a target number of terminals covering the essential industrial areas of the country.

These investments must be seen as part of a global multimodal transport approach whereby all the different multimodal elements are considered within the context of the system as a whole. It would be a mistake to invest large sums of money in multimodal transport, without ensuring the creation of the necessary conditions for its successful development. It is therefore essential to install an adequate structure for the management of multimodal traffic as well as carrying out the required infrastructure investments.

The specific objectives are as follows:

In the short term:

- to enable the railways to meet the requirements of clients and forwarders for handling of multimodal transport units,
- to strengthen the position of the railways in competition with direct road transport,
- to re-establish necessary facilities damaged in recent years.

In the short/medium term:

- to modernise part of the terminal network by re-building or constructing new terminals according to western standards.

3.4.3. Description of the work

Taking into consideration the economic situation of Kazakstan, it is necessary to concentrate investment efforts in the short- and medium-term development of the selected priority key terminals. The main priority is the procurement of handling equipment for 40' containers.

On the basis of the previous table, the level of priority per terminal for upgrading is as follows:

Table 23: Selection of essential key terminals in TRACECA region

Level of priority	Key terminals	TEU per day	relation with the main TRACECA corridor	Remarks
High priority				
Almaty	Almaty 2	> 20	on the corridor	
Priority				
Akmola/ Karaganda	Akmola	10 - 20	little relation	significant increase will be expected (capital)
Tchimkent/ Dzhambul	Tchimkent or Dzhambul	10 - 20	on the corridor	necessary concentration of effort on one terminal only, the Kazak MOT prefers Tchimkent, which is the more important economic centre
Low priority				
Aktau/Mangyshlak	Mangyshlak or port Aktau	5 - 10	little relation	
Aktyubinsk	Aktyubinsk	5 - 10	little relation	
Kustanaj	Kustanaj	5 - 10	little relation	
Pavlodar/ Ekibastus	Pavlodar Yuzhn.	5 - 10	little relation	
Semipalatinsk/ Ust-Kamennogorsk	Semipalatinsk or Semipalatinsk and Zashtchita	5 - 10	little relation	
no priority				
Atyrau		< 5	no relation	
Arkalyk		< 5	no relation	
Dzhezkazgan		< 5	little relation	
Koktchetav		< 5	no relation	
Kzyl-Orda		< 5	little relation	
Tchu		< 5	on the corridor	as a terminal site interesting only in case of concentration of freight into/ from the regions Dzhambul/Tchim-kent and Kyrgyzstan (but very long road transport distance from the origins and destinations to the terminal site)
Uralsk		< 5	no relation	
Particular case				
Druzhba				importance as point of origin and destination of traffic flows through the corridor (exchange with the Chinese Railways), no importance from point of view of local regional freight traffic

Intensive discussions with the Kazak Ministry of Transport and Communication were carried out to define the priority of each of the terminals. The general conclusion is supported by the Kazak MOT (the administration responsible for transport policy and infrastructure development).

However, detailed additional investigations on some of the terminals are required. This concerns in particular the following aspects:

- definition of the most advantageous terminal site in the Tchimkent/Dzhambul region. Tchimkent is the more developed economic region, but is too close to the neighbouring key terminal (Tashkent-Shumilova).

- the definition of the terminal strategy for the Akmola/Karaganda region. The existing terminal at Akmola is heavily damaged and not able to meet the future requirements resulting from the development of the new capital of the country.

- for the long term the possibilities of development of Almaty 2 terminal has to be assessed. Kazak authorities believe it is convenient to built a new terminal in a new and better location, connected with the road network and providing future extension possibilities.

It would be necessary to analyse the terminal sites (especially in the Almaty, Akmola/ Karaganda and Tchimkent/Dzhambul areas) and conduct a pre-feasibility study to confirm the final terminal development strategy. The study should include:

- traffic forecasts,
- analysis of existing terminal sites (availability of space, extension, location relative to rail and road transport infrastructure and the transport demand),
- study of alternative sites,
- definition of basic parameters for further terminal development,
- economic and financial assessment of the different options,
- proposals for terminal development,
- preparation of the decision making process.

3.4.4. Required input

The proposed feasibility study must be conducted in close coordination with the general TRACECA strategy for up-grading rail terminals. A specific study should emphasises the particular problems and new priorities of Kazakstan.

The expected output is: terminal development programme for priority regions,
technical assistance and support in decision making

Potential donor: TACIS (Kazakstan) in co-ordination with EBRD (or other international financing institutions).

3.5. Case studies and training

This section presents a set of Inter-modal case studies prepared to provide short-term solutions to facilitate container traffic, to train staff in appropriate technology and provide medium-term solutions for advanced systems.

The workshop was also to allow transport organisations from different countries and from different transport modes to be brought together around the same table to discuss the Multimodal Transport Strategy proposed by the European team of experts. The audience included 30 participants (the programme of the workshop as well as the list of participants is attached in Annex 8), from Decision makers from Ministries of Transport (or equivalent where there is not such a Ministry), to executives from providers of International transport services (railways, road hauliers, freight forwarders, shipping lines) from the eight TRACECA countries.

Initially planned to be held at two different places, Tashkent and Tbilissi, at the end of November, the Workshop was finally postponed by mutual accord with the TRACECA management in Brussels and concentrated in one comprehensive Workshop. Indeed, this allowed the improvement of the final programme and the participation of experts from other related projects, in particular, the experts from the Project «Container Pilot Train » and « Uzbek Cotton Transport ».

The different topics were addressed during a practical three-day seminar held in Tashkent on the 15, 16 and 17 January 1997. The following topics were covered:

- Multimodal Transport: a logical choice: J. CACERES
- Potential for Intermodal Transport: « Traffic Forecast »: P. PEZANT
- Setting up a Multimodal organisation: C. DURAND
- Organisation of the Multimodal chain through a case study (cotton movement): Mr M. LANDRIN and Mr L. CHEESMAN
- Presentation of the « Trans-Caucasian Container Pilot Train »: W. KRANZ
- Setting up a special container train (schedule and frequency of services) and Advice on terminal infrastructure and handling equipment: F. PRESCHA
- Reorganisation of the container tariff policy: C. DURAND
- The integration of maritime ports: B. FRANCOU

All these case studies complement the previous investment project. They are presented here in the above order.

3.5.1. Multimodal Transport: a logical choice

The following presentation introduces the multimodal concept, synthesises the main findings of the present project and introduces the following presentations.

Introduction

TRACECA countries need to reform their entire trade, logistics and transport regimes. If they are to compete successfully in the world economy they must integrate and accommodate increasingly important concepts such as:

- « just-in-time » delivery : to avoid costly storage, producers tend to produce « just-in-time ». In this production process, the volumes of consignments tend to be smaller but the frequency increases. This implies the need for quick and reliable transport. In parallel, standardised transport units (pallets and containers) are used to ensure that goods keep flowing freely.

- « trade-logistics »: to decrease transport costs, producer-sellers must improve the packaging, storage policy and insurance, etc. This means speed and reliability between the central storage facility and the customer's warehouse.

- « INCOTERMS »: to improve their commercialisation, producer-sellers must sell beyond the borders of the local market without an excessive increase of transport costs. To keep costs under control, producers tend to sell « Free-delivered » instead of « Free-on-Board» or « Ex-Works ».

More than for other countries, these constraints are of particular importance for TRACECA traders because of:

- their land-locked position and the long distances to reach the main trade markets makes which means that their transport costs tend to be high,
- the main export products, which are mainly semi-manufactured products, are highly sensitive to transport costs.

In these conditions, the use of containers represents one of the key issues. However, containers impose additional constraints:

- containers are an efficient support if used in both directions of traffic flow (containers used for import operations must also be used for exports),
- efficient container transport requires "door-to-door" operations[46]. « Door-to-door » operations can only be efficient if the transport flow is not disrupted.

By combining all these constraints, it appears that there is a need for integrating three or four of the different typical professions (forwarding, handling, provision of containers, rail traction buyer and provision of initial/final road transport) into one typical company dedicated to container transport. The main activities of such a company can be defined as follows:

- The concentration of container traffic flows by road at a selected number of rail-road terminals,
- A rail traction from terminal to terminal by specialised container freight train (Block trains),
- A maritime transport from/to ports equipped with container facilities (a CFS container freight service and handling equipment),
- The grouping and co-ordination of different transport operations within a single Management organisation[47] working for the benefit of all the partners involved.

[46] A proper multi-modal corridor in the TRACECA region involves at least 6 transhipment operations (two on land and four at ports). In the purely transport sense, containers can only be efficient if there is no requirement for supplementary manipulation: the contents of the container does not permit manipulation between one extremity and the other. In terms of commercial agreements, this type of operation implies that the "cost and risks" are transferred from the seller to the buyer at one of the two "doors". As a result, the terms of sale can only be: "free delivered" or "Ex-works". The expression "Ex-works" means that the seller's only responsibility is to make the goods available at his premises. The buyer bears the full cost and risk involved in bringing the goods from there to the desired destination. The term "Free delivered" denotes the other extreme: the seller's maximum obligation. All other types of sale are not well adapted to the circumstances.

Such a system helps operators to increase their profit margins (by reducing operating costs) while providing cheaper and better services to their customers.

- The shipper's will benefit from cheaper, faster and better quality transport,
- road carriers can find a solution for long-distance transport which reduces the need for investment in the truck fleet, lower driver cost and better quality service,
- The railways and shipping companies benefit from additional freight traffic, while optimising the use of the existing infrastructure and fleet (rolling stock and vessels).

The formation of an intermodal system covering the TRACECA corridor appears to be the most economical and logical choice. The European Union, through the TRACECA technical assistance programme defined the objectives of the present project components as described in the following sections.

Project objectives:

- advice to solve existing problems in the organisation of intermodal transport
- transfer of know-how, specially in ISO container and Transport techniques
- assistance to rail and « *intermodal organisations* » to design and operate Intermodal services.
- develop proposals to improve intermodal services (including technical and financial measures to be taken).

Project components

- Survey of the existing technology: terminals and transport systems. (concentrating on immediate technology transfer, using the existing system),
- Technical and economical assessment of the feasibility of a well-functioning intermodal network.
- Setting up a multimodal transport group to carry out a study tour in E.U. to examine the organisation of multimodal terminals,
- Set up an intermodal case study to provide:

    1. short term solutions to facilitate the traffic (technical description and economic assessment)
    2. train staff in appropriate technology
    3. gather information on medium term solutions for advanced system (technical description and economic assessment)

Project results

A detailed survey and site visits allowed the identification of the main problems related to the following aspects: Planning; Organisation; Technology; Operation; Marketing and Management and other related aspects (customs and trade facilitation, legal issues)

Planning Aspects

A cost-efficient multimodal system requires a minimum container traffic in both directions of flow. At present, the situation is characterised by:

- Unbalanced traffic flows: only about 10% of the containers used for imports are used for export operations.

- Low level of containerisation of existing traffic: Only 2 large containers per week go through the Trans-Caspian Corridor. The container traffic in rail terminals is decreasing in Central Asia. If the

[47] By evaluating the transport needs of individual firms, the independent combined transport company is able to negotiate attractive tariffs from the Railways Company (they buy rail traction on a basis of the wholesale price). By reselling these services to individual firms (on a basis of attractive retail prices) they make a profit. The benefits are reinvested to finance the required infrastructure (they act precisely as a "freight transport wholesaler"). Examples of such organisations are INTERCONTAINER and the IURR companies (International Union of Rail-road Companies), two organisation visited during the study tour.

existing infrastructure and the equipment are a clear asset, the low containerisation level does not facilitate the replacement and modernisation of the existing system.

Organisational Aspects:

A cost-efficient multimodal system requires the grouping together and coordination of the complex and numerous operations within a single management unit working for the benefit of all the partners. At present, the situation is characterised by the fact that the shipper (or his forwarder agent) has no single valid representative to deal with overall transport operations. They must separately deal with the several partners involved. Each of them (railway, road carriers, shipping companies, etc.) has a « mono-modal » approach to container transport. As a result, the complexity of operations does not encourage the shippers to make use of containers.

(SEE CHART 1)

Technological Aspects

A cost-efficient multimodal system requires the use of appropriate technologies. At present, the situation is characterised by :

- the inadequate adaptation to containers at factory premises Most of the factories (for leading export products) have been designed to work with rail wagons and make little use of containers. Furthermore, the absence of palletisation (a module fraction of a container) slows down the containerisation process.

- Poor provision of road chassis and road trailors for the organisation of the concentration flows by road around the rail terminals

- Technical standards at rail terminals are inadequate. The lack of facilities for handling large containers (particularly for 40" containers), the poor condition of the terminals, containers and rail wagons are also a serious problem.

- Sea port design and standards are poorly adapted to container use. Backup areas are often seriously underestimated and restrict storage capabilities (except in Baku). Rail tracks not embedded into the ground, also restrict the circulation of trucks. The biggest problem is linked with the restricted handling facilities at the port of Turkmenbaschi, which are insufficient, even for 20" containers.

Operating Aspects:

A cost-efficient multimodal system requires the integration and accomplishment of specific co-ordinated operational activities (final collection and delivery by truck, rail traction by special through trains, provision of containers, etc.). At present, the situation is characterised by :

- Road operations disconnected from rail activity. In general, there is no system specifically designed to concentrate/distribute available freight in a given specific area. Local companies do not have contractual partners to operate at the « other end » of the chain.

- Rail container transport is subjected to general freight rules. As any other type of traffic, container train formation is realised by a hierarchical three level system of marshalling (there is no specialised freight container through train). Furthermore, there is no constant timetable (the schedule is only respected when a pre-defined « operational target » is attained). This results in excessive wagon downtime and poor quality of service. Independent container tracking and tracing systems are lacking.

- Container port operations at maritime port are poorly adapted to container traffic. Due to limited storage facilities, all consignments are on a direct delivery basis, whereby cargo is loaded straight

from vessels onto rail cars for immediate dispatch. A CFS shed (Container Freight Services) for stuffing and unstuffing containers is lacking. On the other hand, maritime transport by ferry-wagons means 35% of the shipload is tare and a waste of space with no stacking possibilities.

(SEE CHART 2)

Management and Marketing Aspects:

To be attractive, a multimodal service must be cheaper than the mono-modal alternatives. An individual firm cannot propose attractive freight rates. Only multimodal firms, grouping together and representing a large number of individuals firms, can negotiate attractive rates with railways and shipping companies (as a wholesaler, the company can obtain larger rebates). Only multimodal firms are able to propose attractive container transport tariffs.

At present, the situation is characterised by :

- the tariffs applied to container traffic are still based on the general railways regulations used in the past. As a result, container transport tariffs are particularly high. The addition of rates from the various mono-modal services makes a « door-to-door » overall operation rather prohibitive.

- Current operators have a poor perception of marketing techniques. They do not have any elaborated marketing strategy. Customers often have to make their own arrangements to transport their freight to the destination point using their own trucks or a trucking company they selected and paid.

Other related aspects:

- Transit and Customs procedures: border customs offices are set up with no uniform customs procedures and standards formalities. The complex administrative procedures result in delays at border crossings and slow down commercial train speeds, thereby increasing travel time.

- Documentation : apart from the SMGS rail waybill or the CMR international consignment, the documentation procedures (administrative, legal and financial) are not well known by the senders and operators.

- Legal framework aspects: the development of multimodal transport is hampered by the lack of harmonisation of national transport legislation and regulations related to containers (ISO/CEN norms, transit regimes, mass and dimensions) and with trade exchanges (international tariff framework, customs regulations).

SUMMARY OF PROPOSALS FOR THE IMPROVEMENT OF SYSTEMS

Planning and Traffic Aspects

To revitalise and renew the debilitated container transport system, it is recommended to consider, as a transitory measure, a support from decision-makers from partner States from Central Asia and the Caucasus region. They should encourage the sending through the corridor, of « targeted » progressive volumes of selected export products (cotton, tobacco, fertilisers, metal in ingots etc.) by containers: 50 000 tons/year (5 000 TEU/year). This decision should the setting up of a multi-group container train to Poti. From a « nodal point location » a 20 wagon (40 TEU) a container special train to Poti every two days is conceivable.

Organisational Aspects:

With a minimum container traffic, a progressive technical and operational re-organisational process of a renewed container system should be possible:

* Organisational structure: to organise the first shipment of « targeted » product and volumes, a « High Level Working Committee » should be created in each TRACECA country to define and execute a « Operational Plan ». The Committee must be composed of high ranking representatives from the different sectors (decision-makers, users, railways, road hauliers, freight forwarders and a TACIS representative). The « Operational Plan » must be elaborated by a team of specialists working on behalf of the official members.

* The «Operational Plan »: a team of specialists will prepare an « Operational Plan » within two months. They must explain in detail how the first container shipments should take place (collection/concentration; rail traction by a special container train, operations at the « other end » etc.).

* Implementation and monitoring of the «Operational Plan ». After validation by a « High Level Working Committee » the «Operational Plan » should be implemented and monitored by the same team of specialists. The problems encountered should be reported to the Committee which must then decide how to continue.

  (SEE CHART 3)

* Creation of a Multimodal Transport Independent Organisation: Once the main technical and operating problems are solved, it is recommended to encourage the creation of an independent Multimodal Company. The company must be able to group and manage multimodal transport operations:

  ⇒ evaluating the market (by evaluating the transport needs of individual firms),
  ⇒ buying rail traction at attractive rates (acting as a wholesaler),
  ⇒ reselling multimodal services to individual firms on the basis of attractive retail prices,
  ⇒ controlling the effectiveness of terminal services, setting up actual multimodal transport operators in charge of co-ordinating the logistics of finding, loading, handling, and distributing available containers,
  ⇒ regulating arrivals and departures of containers loaded on the main terminals,
  ⇒ reinvesting the benefits from its activities to create the required supplementary container infrastructure: new terminals, handling equipment, nodal points management etc.

  (SEE CHART 4)

* Creation of a « TRACECA Container Transport Union ». In a further step, it should be envisaged to set up a true TRACECA multimodal transportation operator able to integrate the inter-modal activities in an international community of interests at the TRACECA corridor level.

  SEE CHART 5: Organisation of Multimodal Transport in Western Europe

Technological Aspects:

- Handling equipment at rail terminals must be improved. Investments in telescopic spreaders with folding grapple arms (or simple gear to lift 20' containers) are urgently required. This is to be done at the 20 rail terminals located on the main corridor.

- Handling equipment must be renewed at Turkmenbaschi. Special cranes for lifting 20' and 40' containers must be provided at the port of Turkmenbaschi.

- Sea port design must be adapted to container transport by creating CFS in all the ports (involving re-allocation of some of the available space or creating new areas near the port). To facilitate the

circulation of truck and trailors, pavements must be re-built and part of the rail tracks embedded into the ground.

- The maintenance facilities must be upgraded.

Operational Aspects:

- To set up specialised multimodal trains using the essential « key » terminals with a fixed train schedule and with independent tracking and tracing of containers. The special train must be set up in a multimodal environment where road and maritime links are integrated within the same single chain.

- To design and implement an « Operational Plan » that clearly specifies how to deal with the problems posed by the shipment of « targeted » products through the TRACECA corridor (transport plan, provision of rolling stock and containers, administrative and documentary aspects, tariff negotiations with railways and shipping companies, transit operations, locating transport correspondents, etc.).

Management and Marketing Aspects:

The railways tariff policy applied to Multimodal transport must be re-organised and dissociated from the general railways rules and regulations. Appropriate training of the staff must be envisaged.

Other Related Aspects:

- Technical assistance is required to modernise and harmonise transport legislation related to multimodal transport.

- A simplification of paperwork must be implemented by specific training and advice related to documents and procedures used in international trade and transport.

- Set up customs offices with uniform customs procedures and harmonised standards and formalities based on the « Convention on the Harmonisation of Frontier Control » (it prescribes general inspection practices and reduce the number of controls); the « Customs Convention on containers » (it allows the importation of containers without payment of duties and taxes).

- Technical parameters and operational standards established within the AGTC (European agreement on important International Combined transport) must be adopted to facilitate the harmonisation of the TRACECA corridor with European standards.

Chart 1: Organisatioal aspects / Current situation

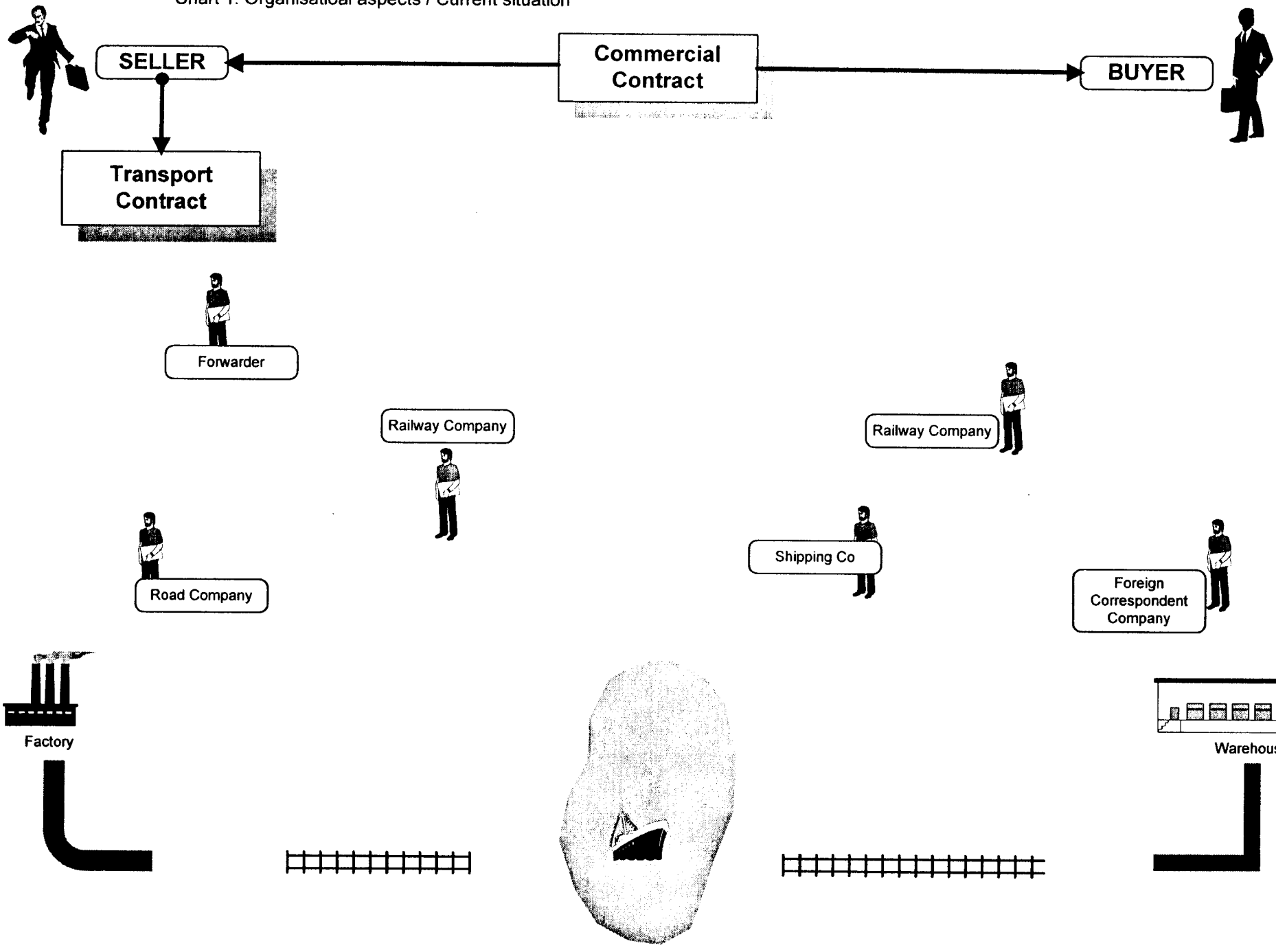
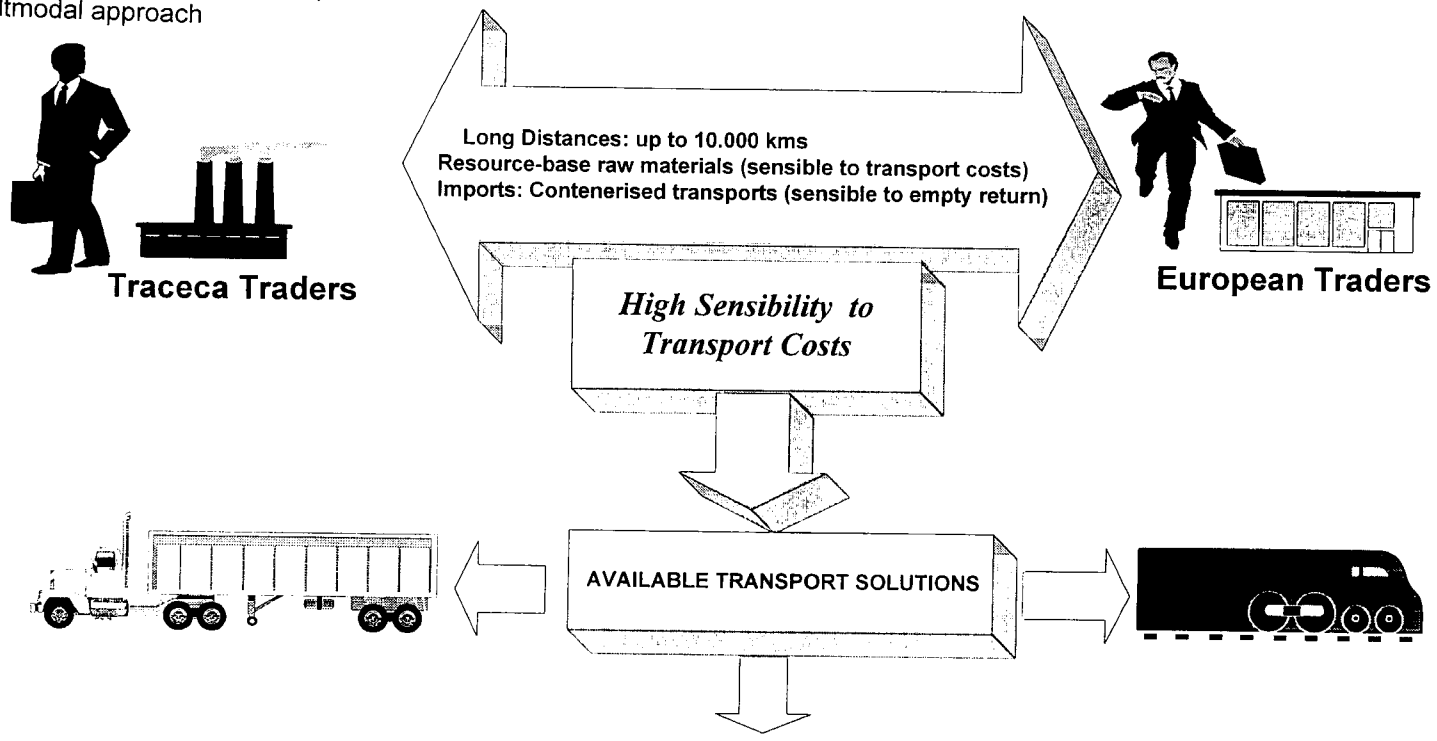


Chart 2: Operating aspects / Current mono-modal practice vs Multmodal approach



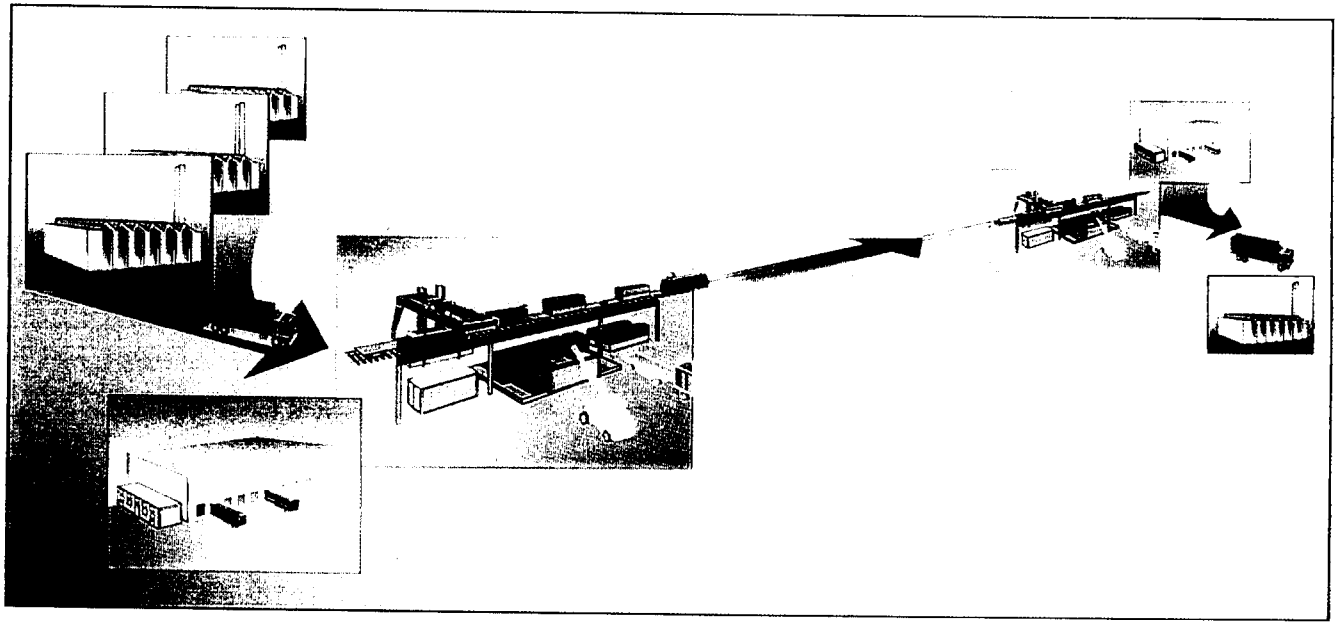
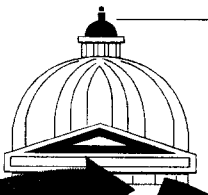


Chart 3: Re-organisational Process through implementing an "Operational Plan"

Decision to promote new transport alternatives: a volume of 1000 TEU/year is to be sent through the TRACECA corridor



A National Multi-modal Transport Working Commitee is created to implement the political decision

IMPLEMENTATION and MONITORING of the COMBINED TRANSPORT PLAN

REPORTING

INSTRUCTIONS

Approval

On behalf of the official members of the NMTC, a team of specialists define a "Combined Transport Plan" (within 2 months)

COMBINED TRANSPORT PLAN

Conditions under which a 20 wagons container special train can be send to Europe through Poti, twice a week.

CREATION OF NATIONAL MULTIMODAL TRANSPORT COMPANIES

CREATION OF TRACECA MULTIMODAL TRANSPORT UNION

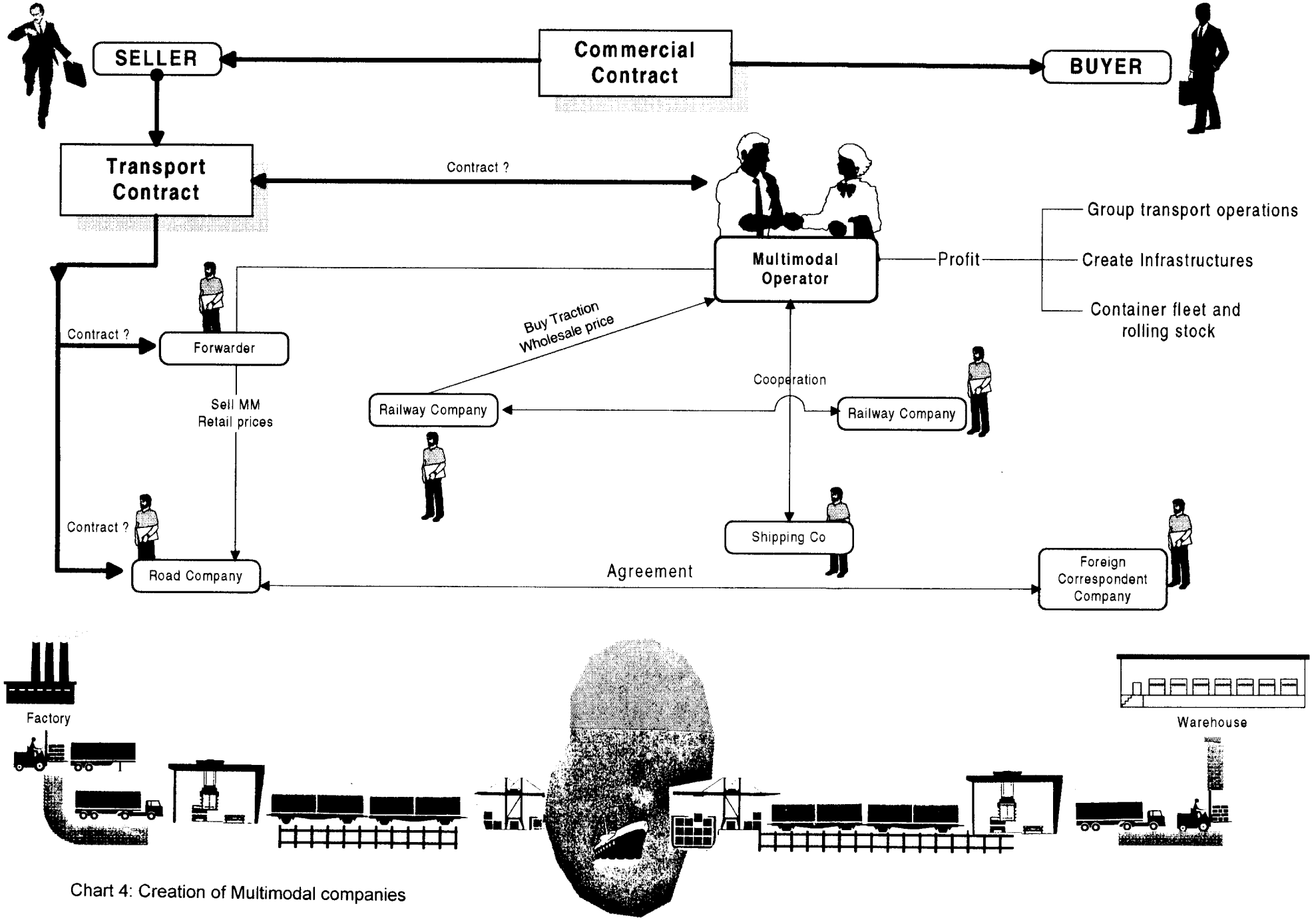
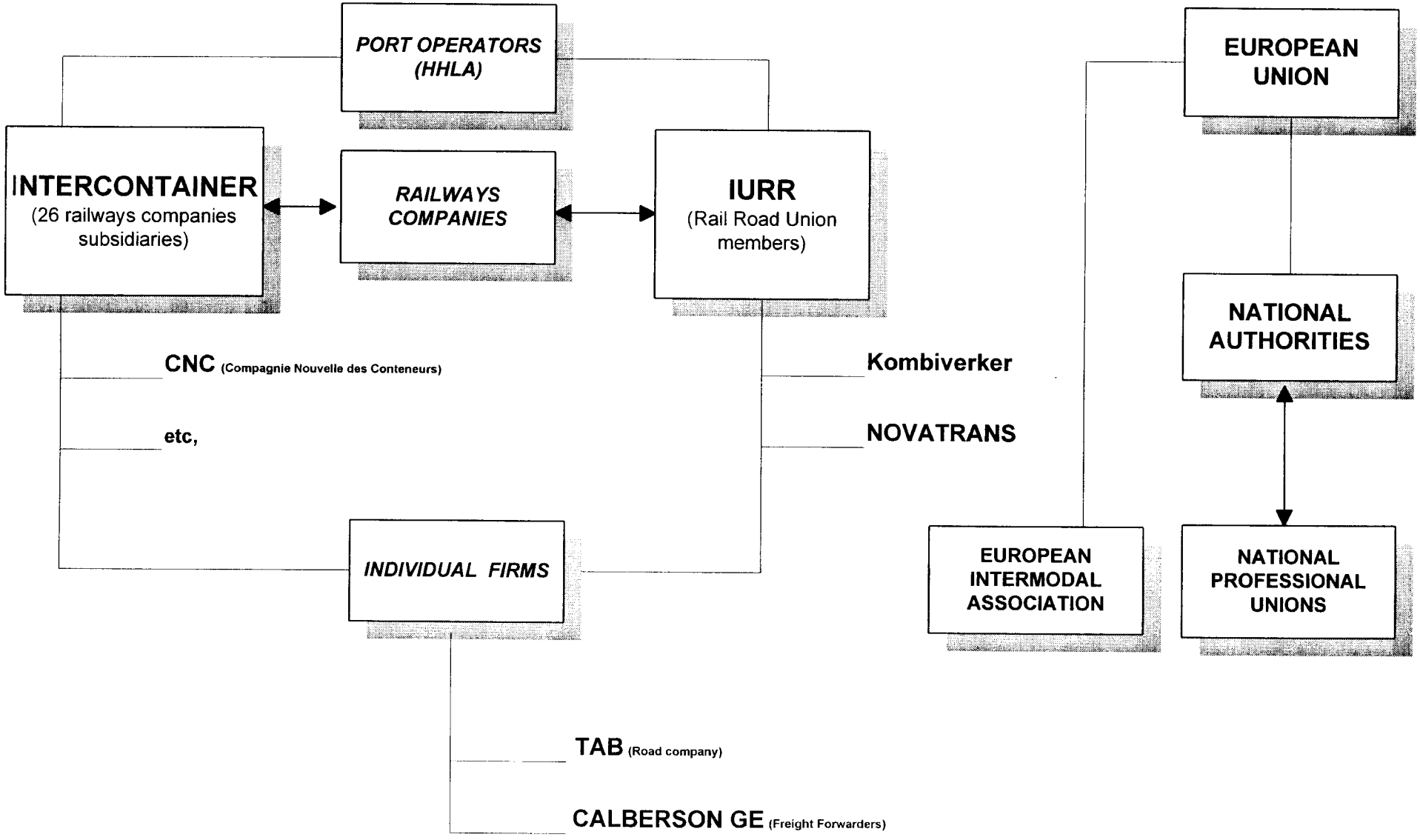


Chart 4: Creation of Multimodal companies

Chart 5: Multimodal transport organisation in EU Countries

(Visited in Juin 15-27, 1996)



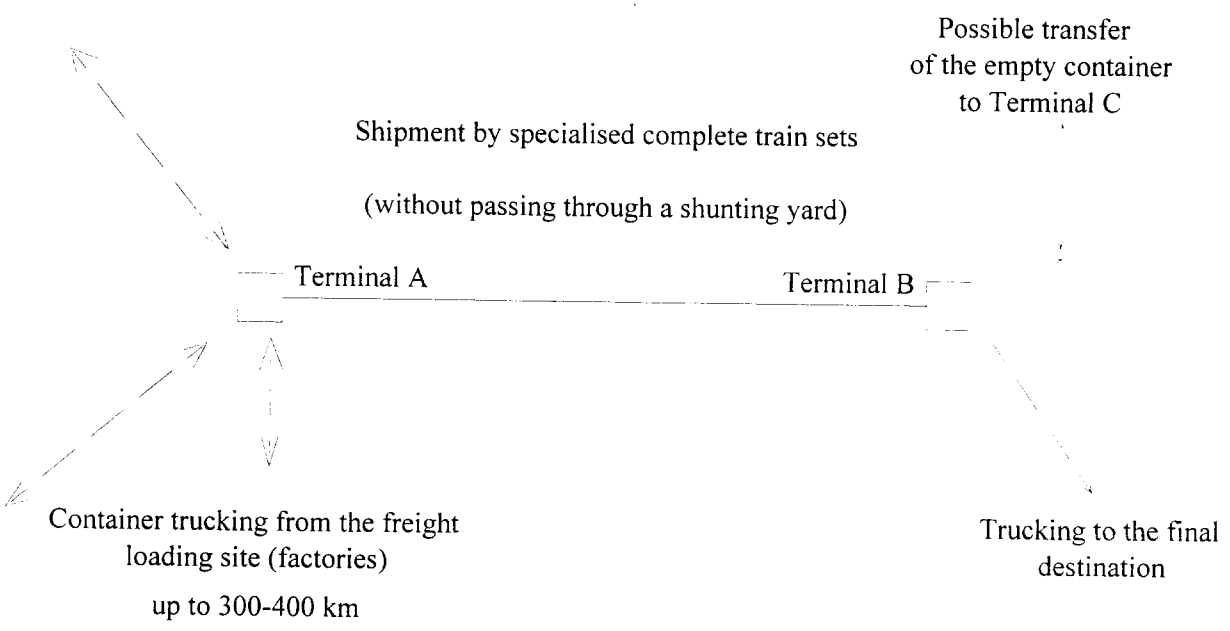
3.5.2. Potential for Multimodal Transport

The potential for multimodal transport was presented by M. Pezant based on the text proposed in the section 2.1.2.9. of this report.

3.5.3. Setting up a Multimodal organisation

Reminder of the concept :

Multimodal transportation units (containers or mobile units) are grouped into freight loads at a handling terminal, loaded on to a special train wagon and shipped to another terminal where they are unloaded and reloaded onto delivery trucks.



What is a multimodal operator ?

It not only refers to the users of various transportation modes, multimodal operators are also in charge of combining the different transportation modes. In Europe, the term "Combined Transportation" is used.

Who is in charge of what in the field of multimodal transportation?

Based on the Western European system, the tasks and roles of each participants are described in the following table »Who does What ».

The main role is that of the operator who is responsible for :

- organising and supervising « door to door » container traffic,
- sub-contracting certain tasks against payment,
- selling package « door to door » transportation deals to individual customers (carriers - forwarding agent - exporters and importers).

WHO DOES WHAT ?

	Who organises ?	**Who performs ?**	**Who sells to whom ?**
Container rental	Customer rental or operator	Customer or operator	Rentals to customers Operator in the overall price
Set up container at loading site	Customer rental or operator	Trucking company	individual bills or operator in the overall price
Trucking	Operator	Trucking company	operator in the overall price
Handling (departure)	Operator	Operator if terminal manager	Operator in the overall price
Railway transportation by wagon **Information**	Operator Operator	Railway operator operator (or customer himself)	Railway to operator included in the overall price
Handling (arrival)	Operator	Operator if terminal manager	Operator in the overall price
Trucking	Operator	Trucking company	Operator in the overall price
Container delivery and relocation	Operator Customer or rental	Trucking company	Operator in the overall price or individual bills

Why are there single Multimodal operators?

1) Public authorities benefit from a close collaboration between railway and highway operators. Governments are willing to deal only with a single operator which represents all of the actual participants.

2) Need to associate and combine all the transportation and logistical services as part of an overall service supplied to customers :

    - railway networks (major role),
    - terminal managers (existing or future terminals) in charge of handling, monitoring, storage and container data.
    - truck drivers in charge of delivering, carrying and loading the goods.

3. Supervision and information regarding the ITU load route at critical points of the journey: TRACECA corridor, Poti Port, wagon loading, Baku, loading containers on ships crossing the Caspian Sea, wagon transfer (Turkmenbachy), Tchaigeon and destination terminals - final delivery by truck.

The tasks described below are those undertaken in Europe by Specialised Multimodal Transportation Operators.

Public operators, i.e. subsidiaries of the railway networks or trucking operator associations opened to all customers.

Example: CNC (New Container Company) in France.

- KOMBI VERHER in Germany
- INTERCONTAINER
- private operators, i.e. participants in a specific field with a single purpose: increasing company profit margins.
- RAILTRANS in Belgium
- AMBROGIO in Italy.

All of the above are joint-stock companies which are liable to their clients and to private contractors. They perform the above-described tasks or use the services of sub-contractors.

Their corporate status allows them to freely set tariffs according to the market while covering their overall expenses. Their corporate status also allows them to comply with and to apply international conventions which rule multimodal transportation (Operators participate in the CIM, the TIR, FIATA etc.). Their corporate status allows them to sign sales contracts with foreign firms and grants them total autonomy from governments, railway networks or national organisations, and they can therefore act freely in major competing markets, or compete with other foreign operators.

TRACECA seems to be currently in a similar situation as Western European railway networks were in the 1970s. When containers shipped to a European destination were loaded on to trains in the ports of Rotterdam, Hamburg, Le Havre, Antwerp, at the same time, the railways had to set up a single, independent operator to develop this new type of container traffic. This turned out to be a major success and today, INTERCONTAINER deals with over 1 500 000 TEU per year.

We can only wish similar success to the TRACECA single multimodal operator in the future.

ADVANTAGES OF INTEGRATING VARIOUS MULTIMODAL TASKS

1. Monitoring a container from the departure to the destination terminal.

   The success of multimodal transportation is not based on performance results during a single stage of the journey (e.g. quality and cost of handling). It is based on a thorough analysis of performance results at all stages of the journey.

   Therefore, the operator will have to monitor containers from the moment they are loaded at the client's site to the end of the trip when containers are freed once unloaded.

   Only an honest operator can show interest in gathering data regarding the unfolding of the different phases of the trip as part of an ACTIVE TRANSPORTATION MONITORING policy. Such an operator will also be motivated to look for freight loads at the destination terminal to re-load the empty containers. This is actually a priority concern for operators, given the cost of transporting empty containers.

2. Purchasing multimodal service package deals

   - For instance: purchasing railway transportation on complete train sets or based on yearly quantities. 25 to 30% rebates are usually granted in such cases.
   - Optimising handling costs by concentrating container traffic in terminals selected as a function of their geographical location with capital investment depreciation (purchase of state-of-the-art cranes) when container traffic is heavy.
   - Reduced trucking costs when distribution logistics are optimised. Up to 100 km, trucking costs are almost fixed costs (due to depreciation, maintenance and driving costs). It is therefore easier for a specialised operator to organise 5 to 6 daily transportation services whereas a single customer has to sustain all the above listed fixed costs.

   Similarly, the accumulation of container traffic allows the operator to organise its own hub to exchange container loads. Thereby, he has more direct control than if he had to use a railway hub, and is able to provide higher service quality. Intercontainer's experience in Metz shows that transportation between BENELUX countries and ITALY were 12 to 24 hours faster since a hub was set up. However, no single customer can fully handle the container traffic that was not carried on a complete train set.

   The flexibility of the resources implemented (cranes, wagons, trailers, etc.) can ensure higher capital investment productivity rates and is better suited to meet seasonal needs, etc.

4. Promoting multimodal container traffic

   Honest operators are those who truly promote multimodal container traffic. Their entire business is based on this product. Therefore, they are usually those who market this type of traffic by using incentives to encourage freight load owners (private companies). They use more aggressive and efficient methods than transportation brokers who have a tendency to promote single mode container transportation prior to multimodal container transportation. Therefore, we can consider that specialised operators have a 20 to 30% higher market penetration than simple single mode transportation brokers.

ОПИСАНИЕ ПРОЕКТА

ПРОГРАММА ТАСИС ТРАСЕКА

Наименование: **Реконструкция международного морского порта Туркменбаши (Этап 2) - Погрузо-разгрузочное и контейнерное оборудование**

Государство-получатель: **Туркменистан**

Обоснование и цели:

Порт Туркменбаши является главным морским портом Туркменистана. Он занимает ключевое стратегическое и коммерческое положение на Каспийском море. Порт расположен в самой южной точке системы связи железной и автомобильной дороги в средней Азии. Он является ключевым элементом коридора ТРАСЕКА (Транспортный коридор Европа-Кавказ-Азия).

Поднимающийся уровень Каспийского моря, наблюдаемый с 1975 года, создает основные трудности при эксплуатации парома между Туркменбаши и Баку , в связи с чем первоочередной задачей является модернизация обоих паромных причалов. Это уже было учтено в Этапе 1 проекта ТАСИС ТРАСЕКА.

Целью Этапа 2 настоящего проекта является подготовка проекта нового погрузо–разгрузочного и контейнерного оборудования порта Туркменбаши для замены имеющегося основного комплекса, для удовлетворения первоочередных потребностей а также для будущих расширений. В проект влючена подготовка тендерной документации для общего оборудования порта.

Проект реализуется при тесном сотрудничестве с ЕБРР, который имеет обязательство по инвестиции 50 М долларов США для порта. Проект согласуется с деятельностью ЕБРР и ТРАСЕКА в портах Актау и Туркменбаши.

Основные составляющие:

Проект включает в себя четыре этапа:

Первый этап: Определение проектных параметров

Во время данного этапа консультант должен определить проектные параметры с указанием количества груза для каждого вида товара, общую компоновку будущего порта, аспекты эксплуатации порта во время строительных работ и после их окончания, механические аспекты почвы, силу землетрясений, пропускную способность новых причалов. Следует учесть уровни моря а также типы морских судов, мощность погрузо-разгрузочного оборудования, подъездные дороги и пути, потребность в закрытых складских помещениях. электро- и водоснабжении, практику использования правил и стандартов и пр.

CONCLUSION

If you are as convinced (addressing the audience) as myself that all the participants in multimodal transportation should be gathered into a single activity, despite the fact that they sometimes have diverging interests, we have to choose between:

- simply coordinating existing activities
- creating a new entity

This choice is based on:

- Potential container traffic increases. We previously saw that this is possible and that we should make an effort to increase traffic on the TRACECA railway corridor.
- The quality of the service provided. Mainly based on reliability of the transportation against the resources implemented.
- The level of cost against transportation costs of competitors or of single mode transportation organisations.
- The cost level will be determined according to how much customers are ready to pay to send their freight loads on the TRACECA corridor (with or without governmental incentive subsidies).

The above issues have to be dealt with in the Business Plan in order to assess whether we should immediately set up a new independent contracting firm or whether we should previously coordinate existing activities.

BUSINESS PLAN

With local partners who agree to participate in the project:

1) EVALUATE EXISTING TRAFFIC

2) ASSESS RESOURCES TO BE IMPLEMENTED

- Directly
- Subcontracted

(including the resources required to manage multimodal traffic: data, scheduling transportation, billing, etc.).

3) EVALUATE THE COSTS OF THESE RESOURCES

How can the start up period be financed?

4) PLAN EXPECTED REVENUE (and form of payment)

5) EVALUATE FOR THE AMOUNT OF MONEY TO BE GAMBLED

Lump sum for each participant

6) PROJECT SCHEDULE

3.5.4. Container movement from Uzbekistan: the case of cotton

The present case study has been prepared by Mr Landrin, expert of the Multimodal Transport Project. Mr Cheesman, expert of the « Trade Facilitation » project completed the description.

Start situation

Uzbek authorities, together with the authorities of the other countries of Central Asia, have decided to forward cotton: by container through the TRACECA corridor.

TRACECA authorities asked project managers to assist Uzbek's authorities to concretise this objective.

The consultant suggested the following method:

i. describe the market profile,
ii. identify the actors of the market
iii. describe the current sales procedures and logistics as well as the seller's position and possibilities by conducting a market survey in Uzbekistan.
iv. Sound out the buyer's position (through a market survey in Europe) on possibilities to shift to multimodal techniques and use the TRACECA corridor,
v. Study the constraints linked with the use of a new technology,
vi. propose a method to reach the initial objective.

The Market Profile

About 1 million tons of cotton is exported from the 12 regions of Uzbekistan every year. Uzbekistan is the second largest exporter of cotton after the USA. Following harvesting, the cotton is processed at the ginneries and dispatched against purchasing orders. The cotton is normally sold on a FOB basis or Franco Border, and it is therefore the responsibility of the Uzbekistan seller to transport the cotton to the border or to the port of shipment. This operation is normally undertaken by dispatching the cotton through rail wagon to the special storage facilities located at Chop or at the Baltic and Russian Black Sea port : mainly Riga, San Petersburg and Ilyeschovsk.

The Traders

Sellers:

The sale of cotton is undertaken on behalf of the government by the Ministry of Foreign and Economic Relations (MFER). Within the MFER, the cotton buyers are required to negotiate with 3 separate organisations :

Innovatsia
UZ Prom Mosh Imp Ex
UZ Markaz Imp Ex

Uzhlopkopromsbyt (UZH) is a state agency under the Ministry of Industry. The movement from the ginnery to a port of sale or to a frontier station of sale is part of his responsibility.

Purchasers :

There are seven major purchasers of cotton active in cotton market.

The Sales Procedures and logistics

The normal method of purchase consists for the cotton traders to negotiate with the Ministry of Foreign and Economic Relations. A letter of credit is raised and issued with payment to be made FOB at the selected seaport or frontier station. The sale is initiated on the basis of the certificate of quality issued at each ginnery. However this system is not considered to be sufficiently reliable and a recognised classification company is usually required to make independent checks prior to confirmation of sale. This independent check is normally undertaken at the seaport or frontier station. The 'drawdown' of the letter of credit is not effected until the classification has been agreed between the parties.

The responsibility for the movement from the ginneries to the seaport or frontier station lies with the seller. This is undertaken on behalf of MFER by Uzhloprombyt. All local transport costs are paid in local currency sum. The cotton is normally loaded in covered rail wagons. Due to the poor condition of the wagon and the dangers of spontaneous combustion, it is necessary to line wagons with kraft paper and seal the openings.

The Uzbek seller is responsible for the packing, delivery to seaport or frontier point and any charges for loading on ship (at Riga or Illyechorsk) or on wagon (at Chop) plus export customs clearance and documentation charges. These costs are dealt with through Uzvneshtrans. U2W are also responsible for any damage in transit. From these ports or frontier stations, cotton can be finally graded to ensure conformity. It is then purchased FOB by the buyer who despatches the cotton by ship, rail or truck.

The trader's point of view

The transport criteria on behalf of the merchant are the following :

Terms of sale, price :

The merchant sells 'franco domicile' or free delivered customer warehouse. He is responsible for arranging and paying for the transportation from FOB at the port or frontier point through to the spinning mill. The merchant attempt to maximise his profit on the sale which is the price of selling to final client, minus his expenses all along the transport chain.

Port facilities:

Cotton merchants require certain facilities at the port :

- modern warehouse with sortation facilities and fire prevention systems
- shipping companies able to provide regular services with vessels equipped to receive containers
- container handling facilities
- suitable accommodation in vicinity of the port

Implications linked with the new multimodal method

Re-routing changes

Current routes are:

i. Rail: the current method is to use the rail system from the ginnery to the FOB port or FOB frontier station.
ii. Trans Caspian: Water transportation from the port of Turkmenbashi to Baku
iii. Road haulage: By truck from the ginnery/warehouse to the main railway station.
iv. Handling system: Unloading-reloading : loading equipment are available at ginnery and railway station

The proposed TRACECA route

The TRACECA route to Poti is substantially shorter than Riga, Illyechovsk and Chop. But, there is a need for promotion and to create conditions to obtain a service as good as current routes:

i. develop the rail infrastructure
ii. improve rolling stock maintenance
iii. introduce a modern rail wagon tracking system
iv. fit out the ferry terminals at Turkmenbashi and Baku
v. develop the port of Poti

Logistics changes

Multimodal transport with containers means the cotton has to be loaded on plants or in storage warehouses from which it is directly delivered on manufacturing sites (spinning mill). It means:

i. good warehousing for containers and bulk in Uzbekistan,
ii. regular shipping lines from Poti
iii. good local facilities for staff in Poti.

A « door to door » container shipment direct from Uzbekistan, either from the ginnery or a consolidation warehouse direct to the end-user will reduce the amount of damage to the cargo which generally occurs through multiple handling of loose goods and gives lower unit transport costs because of this reduced handling.

The new technology requires improvements in classification at the point of origin as compared to the current situation. Merchants or buyers are concerned about the reliability of the quality control aspects.

Changes on the terms of sale and on the transfer of responsibility along the chain

The use of door to door containers implies only two terms of sale can be applied :

i. Ex works
ii. Free delivered

The terms of sales will have to be changed from FOB (« Free-on Board ») to these two terms which means:

* « Ex-works » : the buyer is responsible for the total transportation, from warehouse or factory to the final user.
* « Free delivered » : the seller is responsible for the total transportation, from ginnery or consolidation warehouse direct to the end-user, i.e. the seller is responsible for the delivery at the spinning mill and pays all the FOB costs, seafreight and terminal charges.

In case of « ex-works » basis sales, it is necessary to clarify the relationships between the Uzbek sellers and the merchants. This requires the Uzbek sellers to accept the real meaning of ex-works contracts which implies that the trader has total freedom regarding shipment of the cotton and choice of the mode and conditions of transport. This is not the case now as Uzvneshtrans has the monopoly of these operations and is able to dictate its own conditions.

It is essential to allow other companies to take part in the activity of cotton transportation. These new companies which will work in close relationships with European partners will promote the TRACECA line when dealing with their clients.

In case of « Free delivered » sales basis, the Uzbek transport companies will also have to take agreements with European companies particularly when organising end-haulage transports.

Conclusions and recommendations

Uzbek sellers should theoretically benefit from the use of the TRACECA corridor which appears to offer the best link in relation to the main markets which are Italy, Portugal, Spain and Turkey. The initial emphasis should be on enhancing conventional logistic system prior to introducing the multimodal concept.

Despite some difficulties, an opportunity may exist as long as part of the shipments could be containerised at source. Once the development of a more reliable classification system and availability of containers is performed, it may be possible to dispatch such traffic on a « door to door » basis.

It is proposed to improve the system by involving all the concerned partners, assisted by TRACECA experts, in a series of activities

- Organisation of the shipments from and to terminals (haulage),
- Review of the administrative aspects and of the required transport documents.
- Briefing on international transport contracts, specific to multimodal operations
- Writing documents to facilitate international payments (i.e. TBL).
- Aggregation of tariffs with :
  - * Railways
  - * Handling companies
  - * Shipping companies
- Establishment of co-operation agreement with the owners of containers.
- Organisation of the transfer of responsibility along the entire logistic chain.
- Establishment of commercial agreement with European forwarders in order to promote the traffic.

3.5.5. The Trans-Caucasian Logistic - Express

Introduction

The new logistic service has been developed within the TACIS/TRACECA programme. The system characteristics and an information system for the Logistic Express has been developed by TEWET in close cooperation with the Azerbaidjan State Railways and the Georgian Railways during 1996. The system has been harmonised and finally agreed upon during several joint meetings of the expert team and the railways in Tbilisi, Baku and Berlin.

Within this TRACECA project also a traffic volume forecast has been carried out by TEWET. Future traffic flows were determined on the base of an analysis of development of main macro-economic factors, such as Gross Domestic Product, industrial output and foreign trade volumes for the countries concerned.

The forecast was carried out for the whole railways' network as well as for the transport corridor Baku-Batumi/Poti. As an example, the outlook for 2015 (optimistic scenario) is shown in Charts 1, 2 and 3 (presented at the end of this section). Based on this general traffic forecast the freight potentials for container traffic in this corridor had been determined. The results are shown in the following table:

Table 24: Components of the Trans-Caucasian-Logistic-Express

(freight potential in the relations Poti - Baku and Baku - Poti[1)] expressed in TEU/month)

State of destination/ state of sender	Real volume for the first 6 months 1996	Substitution Potential (Road transport)	Growth Potential (01.07.1996 - 31.12.1997	Total Potential (31.12.1997)
1	2	3	4	5
Georgia	14	45 [(2)]	16	75
Azerbaidjan	28	34 [(2)]	15	77
Russia	6	7 [(2)]	3	16
Central Asia	2	2 [(2)]	1	5
Armenia	42	32 [(3)]	14	88
Total	**92**	**120**	**49**	**261**

[1)] The numbers show the potential in one direction. They are provided by the both railways on the basis of the number of transported containers and sent containers in the port of Poti. For the Baku-Poti-direction was taken the same potential of empty containers.
[2)] The assumption is that road traffic will rise by 15% and the substitution share will increase to 65%.
[3)] The assumption is a 15% growth

In the framework of the TRACECA Project « Joint Venture(s) » for the Caucasian Railways (07/96 - 06/97) a proposal and a Business Plan for an "Operations Company - Logistic Service Centre, have to be carried out. This service centre may include AGZD and GRZD as well as other organisations.

Main Requirements

The Trans-Caucasian Logistic Express is a new kind of transport technology that was unknown in the former Soviet Union. The main requirements are as follows:

- Fast and reliable transport link between Europe and Asia,

- Reliable departure once a week in each direction by strict timetable,
- Transport time less than 30 hours in each direction from Poti to Baku and viceversa,
- The Railway transport charge amounts to 50% of the present charge in general,
- Logistic information system for customers,
- Guaranteed safety by transport attendants.

Results of the first three-month experience

The first train left Baku on 11.11.96 and Poti on 14.11.96. During November 1996 up to February 1997, 15 trains were running in each direction and transported 136 TEU and 75 empty containers. Both Railways selected platforms and containers for the train and had them repaired. The team has started a Marketing Campaign on TV and newspapers and journals in Europe and the TRACECA region. The maximum capacity of the train is 30 wagons and 90 TEU. For the marketing and commercial questions Aszheldorexpedicia and Zheldorexpedicia of GRZD are responsible. Chart 3 gives an overview of the operation of the Logistic Express and the information system. For the information system the application programmes have been prepared and the necessary hardware has been ordered.

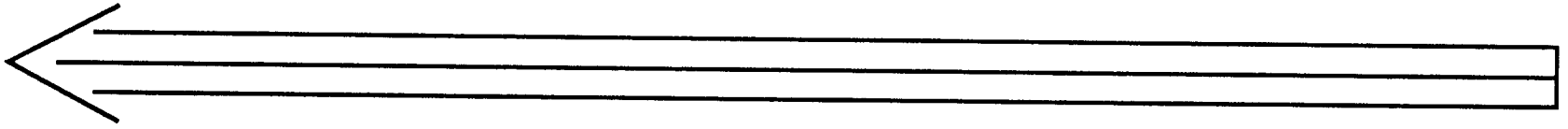
Results and recommendations for the future

On the basis of the marketing campaign the Project Team and the forwarders received 46 inquiries from Western Europe for the Logistic Express, 25 of them concern certain transportation. The results of the marketing in Azerbaidjan, Georgia and Central Asia are still unsatisfactory and collaboration between the Georgian and Azerbaidjan Railway Forwarders is to be improved. In the future a joint Operation Company can give better results and better meet the demands of the customers, i.e., to have only one responsible organisation for transportation from door-to-door by rail, road and sea.

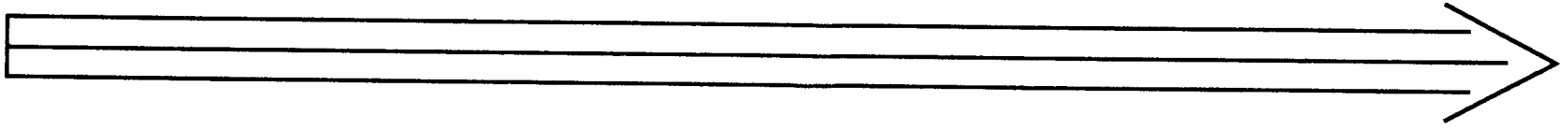
To secure further transport flows between Europe, the Caucasus and Central Asia to this corridor, transport and service conditions have to be guaranteed at West European standards. A closer cooperation with the Uzbekistan and Turkmenistan Railways will contribute to increase transport flows.

LOGISTIC - EXPRESS BAKU - POTI

Wednesdays at 2.20 AM — **Logistic-Express 30 hours 20 minutes** — **Mondays at 8.00 PM**

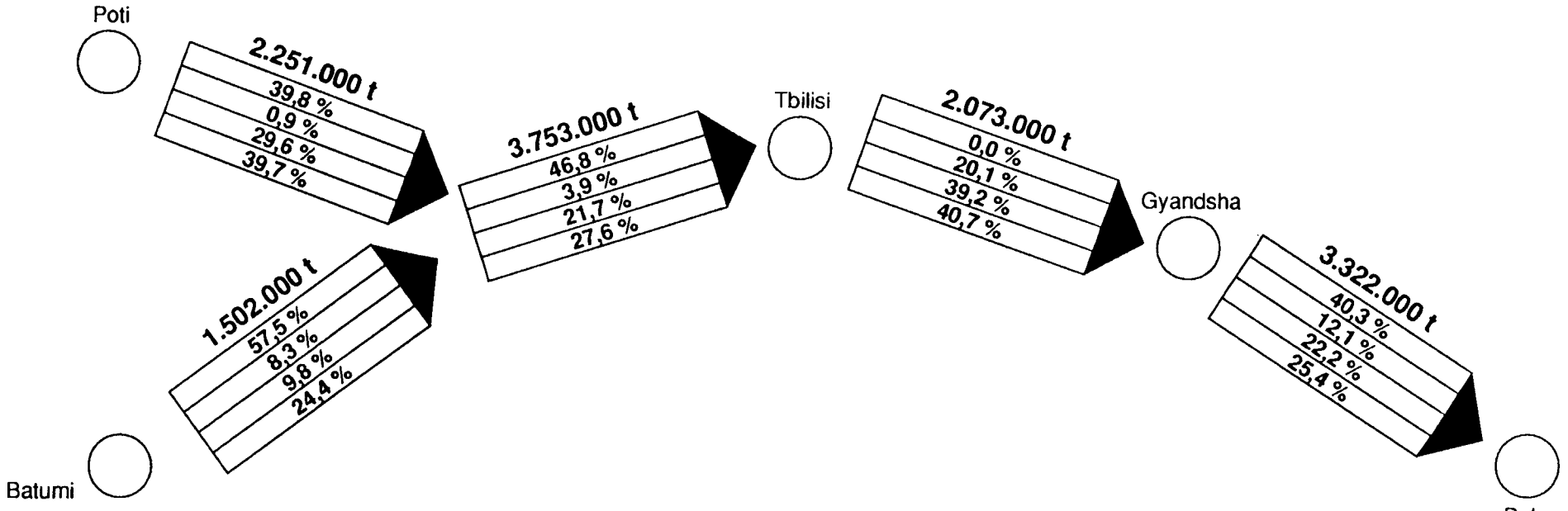


POTI — **Samtredia** — **Tbilisi** (Tbilisi tovarnaja | GRZD) — **Gardabany** — **Beyuk-Kyasik** — **Gyandsha** — **BAKU** (Kischly | AGZD)



Thursdays at 8.00 PM — **Logistic-Express 30 hours 50 minutes** — **Saturdays at 0.50 AM**

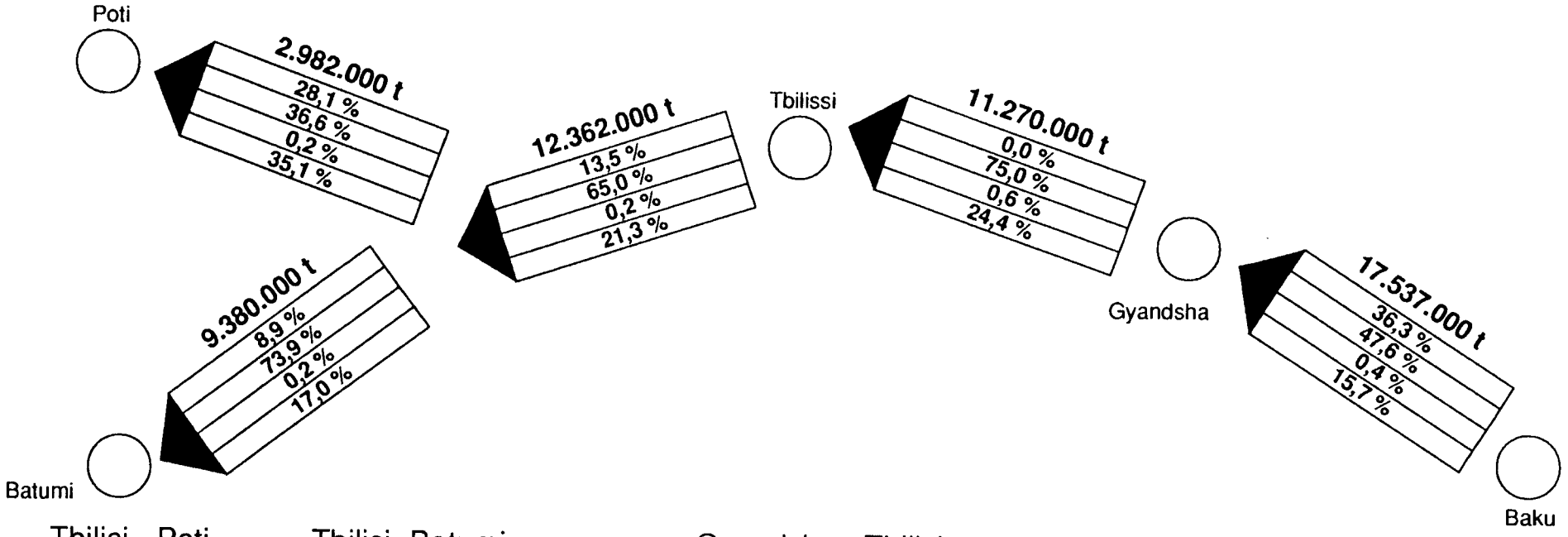
FIG. 2. TRAFFIC FORECAST IN WEST-EAST DIRECTION FOR 2015 (OPTIMISTIC VARIANT)



Poti - Tbilisi	Batumi - Tbilisi	Tbilisi - Gyandsha	Gyandsha - Baku	
895.000 t [1)]	863.000 t [1)]	0 t	1.339.000 t [2)]	Domestic traffic
20.000 t	125.000 t	416.000 t	403.000 t	Exports Georgia
667.000 t	147.000 t	814.000 t	737.000 t	Imports Azerbaijan
669.000 t	367.000 t	843.000 t	843.000 t	Transit

[1)] including Georgian imports [2)] including Azeri exports

FIG. 1. TRAFFIC FORECAST IN EAST - WEST DIRECTION FOR 2015 (OPTIMISTIC VARIANT)



Tbilisi - Poti	Tbilisi -Batumi	Gyandsha - Tbilisi	Baku - Gyandsha	
837.000 t[2)]	833.000 t[2)]	0 t	6.373.000 t [1)]	Domestic traffic
1.093.000 t	6.936.000 t	8.456.000 t	8.350.000 t	Exports Azerbaijan
5.000 t	19.000 t	66.000 t	66.000 t	Imports Georgia
1.047.000 t	1.592.000 t	2.748.000 t	2.748.000 t	Transit

[1)] including Azeri imports

[2)] including Georgian exports

3.5.6. Setting up a specialised Container through train in Central Asia

Reminder of the current problem

In Central Asia and Caucasia, a specialised freight container rail traction system does not yet exist. Container wagons are carried as single wagons or groups of wagons only. Thus, container train formation and operation is subjected to the same general rules, based on « operational target » with no transportation masterplan. The train path of the schedule is only used if the number of wagons matches the pre-defined gross weight or length of trains. Otherwise the train path is not respected. Thus, all the train paths are in principle only optional trains (they only run if the number of wagons is found sufficient). As there is no real constant timetable for goods trains, clients cannot rely on the railway operational system because there is no guarantee of a regular or just-in-time train service.

The carriage of single wagons and groups of wagons is realised by a hierarchical system of marshalling and shunting yards:

- The first level: The marshalling stations as well as the border stations are connected by inter-marshalling yard trains.
- The second level: small shunting yards are subordinated to the marshalling stations. They have to form/split up primarily local freight trains to/from neighbouring marshalling yards.
- The third level: stations (including the private sidings connected with them) are subordinated to the stations with shunting yards. Between the stations and the shunting yards transfer trains are running.

This results in irregular freight forwarding, a much lower level of traffic on the main line, excessive wagon downtime on singular points along the route and at borders etc. This is a major drawback as compared to the average freight forwarding time required for exchanges between TRACECA countries and Western Europe through competing routes (via Chop and Brest). What's more, no complete train set, shuttle train or trains can cross the border without being further re-assembled. Besides, as the trucking activity is disconnected from the rail activity, the concentration of freight loads at main terminals is carried out too slowly.

Suggested re-organisation of the train formation and traction of container trains

It is proposed to organise step by step a specialised freight container through train from Almaty to Turkmenbashi. This train operating organisation is based in the suppression of costly shunting operations and stops. They provided reduction in rail traction cost and they help to increase the quickness, reliability and security of transport operations. By suppressing shunting operations, railway companies do not need to deal with the collecting and delivery operations. This results in a lower immobilisation of the rolling stock at the users' premises and the turnover is therefore improved. Furthermore, working procedures are simplified and the need for infrastructure is reduced to the lowest possible level.

The train offer must comply with the clients' requirements:

* stable (offered during a long period)
* regular (it means traffic by fixed schedule)
* reliable and safe (absolute observance of the schedule with guarantee of safety on the way)
* fast
* not expensive
* guarantee necessary service level, information retrieval - *Tracking and Tracing*)

Implications linked with the new train formation and traction method

A "specialised freight container through train needs regular traffic. The minimum freight container traffic required to organise a specialised freight container through train is:

* about 2 500 TEUs/week, if there is one scheduled train per week and per direction (this is about 25 000 tons)

* about 5 000 TEUs/week, if there are two scheduled trains per week and per direction (this is about 50,000 tons). The conditions necessary to achieve the container traffic objective is of the order of 1000 TEU per year and per country (in average)

To reach this objective, strong initial support is essential at the initial stage. The specialised multimodal train should run on the essential "key" terminals and with a fixed train schedule coordinated with the "Trans-Caucasian-Container Train ".

Proposed Itinerary and operating conditions

It is recommended to start with a train from Turkmenbashi - Tashkent with stop over in:

⇒ Ashgabat (service of the terminal Obezberdy Kuliev),

⇒ Mary/Chardzhev (with integration of traffic from/to Iran border via Tedzhen -Serakhs),

⇒ Bukhara,

⇒ Samarkand,

⇒ Tashkent-Shumilova.

This train has to be scheduled in this way to allow comfortable connection in Baku to the Transcaucasian Logistic Train (by ferry).

This train must run with a fixed train schedule, coordinated in Tashkent Shumilova marshalling station with the Kazak railways also to have good connections for groups of wagons from Arys, Tchu and Almaty.

In a second step, an extension of the train must be envisaged to Almaty and Druzhba with stop-over in:

⇒ Tchimkent/Dzhambul,

⇒ Tchu/Lugovaya,

⇒ Almaty

This includes the integration of traffic from China as well as transit traffic between China, Kazakstan and Iran.

According to the traffic increases generated by the improved transport conditions (including attractive freight rates), the following principles must be observed during the trial period:

* if insufficient container traffic is registered, typical transit rail-wagons will be included to reach the optimal train length,

* As direct entry into a terminal of a full 20 - 25 wagon train is not possible due to insufficient length of tracks under the crane, no entry or exit with train. It would be necessary to form trains in the neighbouring marshalling stations and transfer the group of wagons in/out of the terminal by using shunting locomotives.

* No train formation should take place along the route, the train must run without splitting-up on the way. Coupling or detaching group of wagons must only take place on pre-defined intermediates points (Ashgabat, Mary/Chardzhev/Tedzhen, Bukhara and Samarkand).

* The train must no be delayed at the borders (border controls must be improved).

* as traffic is expected to be sufficient, side streams (e.g. to Southern Tadjikistan, Fergana Valley and, in case of extension to Almaty, to Northern Kyrgyzstan) should be operated with fixed and coordinated time-paths in the schedule for feeding trains to the connecting points (such as Tashkent or Samarkand),

* The train should be accompanied by a safety guard in order to guarantee a convenient safety level.

Expected time savings

If there is a sufficient traffic level and consequently no need for intermediate splitting up, the theoretical transportation time, without any increase of the current running speed on the line sections, could be:

Turkmenbashi - Tashkent: 2.5 days instead of 4.5 days now;

Turkmenbashi - Almaty: 4.75 days instead of 8.25 days now;

Turkmenbashi - Druzhba: 6.5 days instead of 10.5 days now;

The following two tables give details of the expected time savings if the proposed « Special Container Train » is adopted.

Table 25: Running time under the existing train operation system as well as in case of a special combined traffic train

Time element/section	Distance, km	Existing operation system		Special combined traffic train		Remarks
		Duration, hours	Total time, hours	Duration, hours	Total time, hours	
Transfer from Kishly station to the ferry port station		1	1	1	1	
Receive of wagons in the port, preparation of the placing of the wagons on the ferry		3	4	3	4	estimated only, at present may be higher
Placing on the ferry and border operations		5	9	3	7	decrease
Ferry		12	21	12	19	
Roll out of wagons from the ferry, border operations		5	26	3	22	decrease
Preparation for departure		3	30	3	26	estimated only, at present may be higher

Time element/section	Distance, km	Existing operation system		Special combined traffic train		Remarks
		Duration, hours	Total time, hours	Duration, hours	Total time, hours	
Turkmenbashi - Nebit-Dag	153	4	4	4	4	
Nebit-Dag, change of locomotive		0,5	4,5			be cancelled
Nebit-Dag - Bami	233	6	10,5	6	10	
Bami, change of locomotive		0,5	11	0,5	10,5	
Bami - Ashgabat	169	4,5	15,5	4,5	15	
Ashgabat, splitting-up and formation of train		20	35,5	2	17	coupling or detaching only
Ashgabat - Dushak	171	4,5	40	4,5	21,5	
Dushak, change of locomotive		0,5	40,5			be cancelled
Dushak - Mary	172	5	45,5	5	26,5	
Mary, change of locomotive		0,5	46	0,5	27	
Mary - Chardzhev	243	6,5	52,5	6,5	33,5	
Chardzhev, splitting-up and formation of train		14	66,5	2	35,5	coupling or detaching only
Chardzhev - Khodzhadavlet	30	1	67,5	1	36,5	
Khodzhadavlet, border control		4	71,5	2	38,5	decrease

Khodzhadavlet - Bukhara	69	1,5	73	1,5	40	
Bukhara, splitting-up and formation of train		14	87	2	42	coupling or detaching only
Bukhara - Samarkand	249	6	93	6	48	
Samarkand, splitting-up and formation of train		10	103	2	50	coupling or detaching only
Samarkand - Dzhizak	113	2,5	105,5	2,5	51,5	
Dzhizak, change of locomotive		0,5	106	0,5	52	
Dzhizak - Shumilova	273	5,5	111,5	5,5	57,5	
Shumilova, splitting-up and formation of train		20	131,5	12	69,5	decrease
Shumilova - Tchengeldy	74	2	133,5	2	71,5	
Tchengeldy, border control		3	136,5	2	73,5	decrease
Tchengeldy - Arys	77	2,5	139	2,5	76	
Arys, splitting-up and formation of train		14	153	4	80	coupling/detaching, change of groups
Arys - Tchimkent	79	2,5	155,5	2,5	82,5	
Tchimkent, change of locomotive or coupling/detaching		2	157,5	2	84,5	coupling or detaching only
Tchimkent - Dzhambul	218	6,5	164	6,5	91	
Dzhambul, change of locomotive or coupling/detaching		2	166	2	93	coupling or detaching only
Dzhambul - Lugovaya	117	3,5	169,5	3,5	96,5	
Lugovaya, change of locomotive or coupling/detaching		2	171,5	2	98,5	coupling or detaching only
Lugovaya - Tchu	115	3,5	175	3,5	102	
Tchu, splitting-up and formation of train		14	189	2	104	coupling or detaching only
Tchu - Otar	155	4,5	193,5	4,5	108,5	
Otar, change of locomotive		0,5	194	0,5	109	
Otar - Almaty	156	4,5	198,5	4,5	113,5	
Almaty, splitting-up and formation of train		14	212,5	10	123,5	decrease
Almaty - Sary-Ozek	192	6	218,5	6	129,5	
Sary-Ozek, change of locomotive		0,5	219			be cancelled
Sary-Ozek - Ush-Tobe	111	3,5	222,5	3,5	133	
Ush-Tobe, change of locomotive		0,5	223	0,5	133,5	
Ush-Tobe - Aktogay	254	8	231	8	141,5	
Aktogay, splitting-up and formation of train		12	243	2	143,5	decrease
Aktogay - Druzhba	304	9	252 = 10 days and 12 hours	9	152,5 = 6 days and 8,5 hours	

Number of wagons required for a special container train Turkmenbashi - Tashkent

According to the number of scheduled trains per week, the number of wagons required will be as follows:

If there is one train per week, a round trip would last one week:

train turn-round:	2.5	days on the Central Asian side of Caspian Sea
	1.25	days on the Caucasian side of Caspian Sea
	1.0	day for ferry (12 hours for ferry link, per 3-4 hours for ferry treatment, including time reserve)
total:	approximately 5 days	

Two train units will be required (maximal 28 platforms corresponding to the maximal capacity of the ferry-wagons). The integration of side streams would require additional wagons equivalent to one train unit. The following table summarises the wagon requirements:

Table 26: Number of wagons required for a special container train Turkmenbashi - Tashkent

	Turkmenbaschi - Tashkent	
	one departure/week	two departure/week
Platforms (in train units)	2 train units (75 -85 wagons)	4 train units (150 - 165)
Platforms (in stations, terminals)	100	100
Stock in operation	175 - 185	250 - 265
Reserve of 20% (maintenance)	about 35	about 50
Total Platforms required	**210 - 220**	**300 - 315**

In case of operation between Turkmenbashi and Druzhba:

train turn-round:	7	days on the Central Asian side of Caspian Sea
	1.25	days on the Caucasian side of Caspian Sea
	1.0	day for ferry (12 hours for ferry link, per 3-4 hours for ferry treatment, including time reserve)
Total:	approximately 10 days: approximately 2 weeks taking into consideration reserve and time in the port of Poti and in the Druzhba unloading facilities	

Between Turkmenbashi and Druzhba, in case of one departure per week, 4 train units will be required (maximal 28 platforms per ferry). Depending on integration of side streams it would be necessary to add additional wagons with a total number of train units (estimated only)

In case of two departures: 8 train units + 4 train units for side streams

Table 27: Calculation of demand for platform wagons

	Turkmenbashi-Tashkent		**Turkmenbashi-Druzhba**	
	one departure weekly	two departures weekly	one departure weekly	two departures weekly
platforms in train units	75 - 85	150 - 165	150 - 165	300 - 330
platforms in stations, terminals	100	100	150	150
stock in operation	175 - 185	250 - 265	300 - 315	450 - 480
reserve under repair (20 %)	about 35	about 50	about 60	about 90
total platforms	210 - 220	300 - 315	360 - 375	540 - 570

In accordance with the results of discussions with the railways there should not be problems with wagon provision for these services as a large proportion of container traffic is already organised on these platform wagons as single wagon transport. However, it there be some problems to meet the requirements of two departures Turkmenbashi-Druzhba.

Information and Communication system required

In the Central Asian railways a computer tracing system for wagons is still existing (it is the general system ASOUP of all CIS railways under technical control and lead of the Ministry of Railway Transport /MPS/ of the Russian Federation). It is possible to find the location of every wagon in the railway network. The marshalling and transition (border) stations are integrated. Tracing inside of the own railway network and the networks of the neighbouring railways is possible without participation of the Main Computer Centre of MPS. Tracing is currently performed on a commercial basis on client's (freight owner or forwarder) request.

However, the existing tracing system is adapted to wagons tracing, not to container tracing. Thus, it is necessary to know on which platform wagon the container has been loaded (in the port, in the terminal or in the border station: Brest, Druzhba, Seraks, etc.). The adoption of a new system is planned in the framework of the Community of the CIS railways (term of realisation ? funds ?). Today, most of the terminals are not integrated in the wagon tracing system. The terminals are very poorly equipped with computer technology. For instance, the Caucasian railways is not integrated in the existing tracing system

To be attractive, a container train requires:

* To provide the information needed by the client
* To help the railways benefit in terms of operational costs

Which information is required?

* Present location of the container: in train N°...., at station ....., on the terminal .....
* State of the container: loaded on wagon, on storage area, at the client's premises, empty, loaded
* Advice of the arrival : in time and before arrival, so that the client or his forwarder are able to organise the appropriate logistic procedures.

When this information will be required?

* arrival of the container in the service region: Poti, Druzhba, Seraks, may be border stations on the border to the RZD,
* departure of the container from the a.m. point or from the departure terminal
* arrival in the destination station/terminal or in the exit point of the service region
* in case of any disturbances: damage, loss, unloading on an other wagon, etc.
* advice for arrival : at the moment not so important, but the importance will increase in the future.

The required creation of an information system, includes:

* the ports (Poti, Baku, Turkmenbashi)
* the terminals (included in the transport system offer)
* marshalling stations (or other stations) where the coupling or detaching of wagon groups takes place
* border stations (Beyuk Kyasik, Farap/Khodzhadavlet, Tchengeldy)

Necessary equipment:

* personal computers with printer
* modem
* fax
* Use of telephone network for data communication (as far as possible)

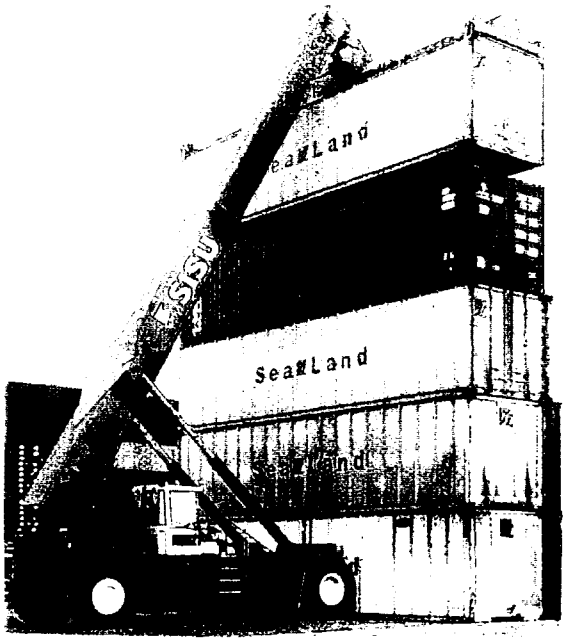
Price : $US 6 000 - 10 000 per included terminal station

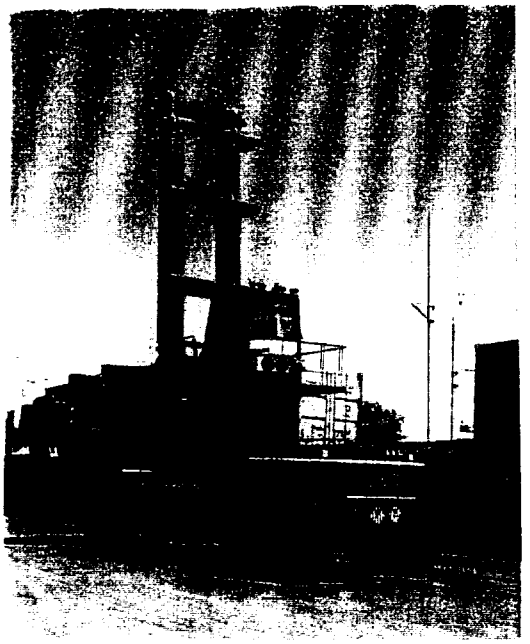
Technical Assistance required

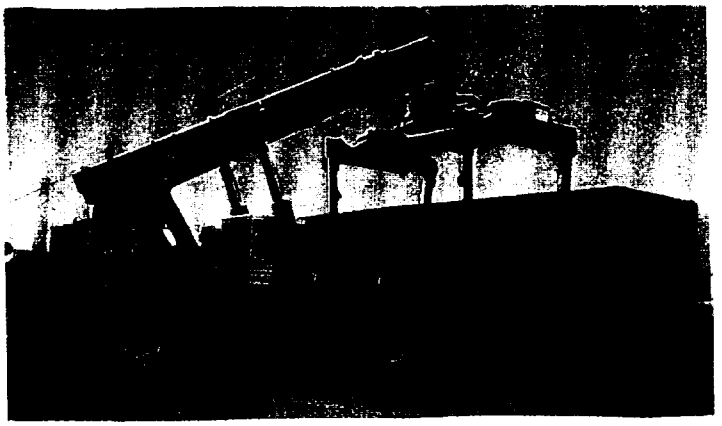
The experience from the TRANS-CAUCASIAN TRACECA container train shows that it is necessary to assist railways companies to adequately implement this new operating method. Main items are as follows:

* intensive discussion to decide the definitive location of the « key » terminals,
* assimilate the experience from the TRANS-CAUCASIAN TRACECA container train,
* coordinate the efforts from the different railways from Central Asian countries,
* coordination with the port links and with the TRANS-CAUCASIAN TRACECA container train,
* preparation of train-path and agreements on trains schedule
* elaboration of a simple and understandable tariff system and agreements on this issue,
* marketing assistance

Mobile equipment (Reach Stacker) - a real alternative







European suppliers (selected, arranged in alphabetical order)

⊠	Belotti	Italy	types	B 91, B93
⊠	Boss	UK	types	G36, G38
⊠	SISU Terminal Systems	Finland	types	RSD 4118-4TL RSD 4120-5TL RSD 4518-4TL RSD 4520-5TL
⊠	Linde AG	FRG	types	C 4130 TL/4 C 4130 TL/5 C 4026 CH/4

parameters: stacking up to 4 high (for railway terminals up to 5 is not necessary)
lifting capability up to 40 t (first level), 27 to 31 t (second level)

price: approximately about 680,000 - 800,000 DM (0.45 - 0.5 million $) for stacking up to 4 high (incl. Spreader)

Modern spreaders

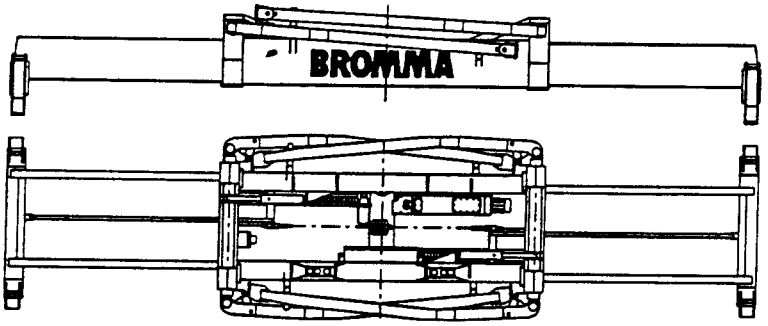
requirements:

- automatic fixing
- moveable for handling of 20' and 40' containers (telescopic spreader)
  telescopic motion about 30 sec
- able to handle trailers and swap bodies (incorporated folding grapple arms or with /easily/ detachable bottom lift arms)
- up to 35 t lifting capacity
- for railway terminals normal class spreaders are sufficient (monobeam), no necessity in using heavy frame spreaders

prices:

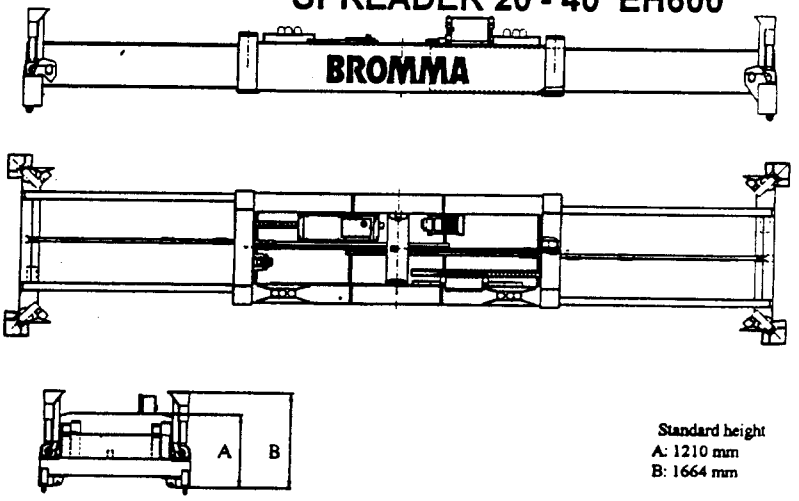
standard version	approximately 50,000 $
detachable bottom lift arms	approximately 30,000 $
more heavy versions	approximately 85,000 $
high level spreaders with incorporated folding grapple	approximately 175,000 $

TELESCOPIC SPREADER 20' - 40' EH 160



Standard height
A: 1500 mm
B: 1800 mm

SPREADER 20'- 40' EH600



Standard height
A: 1210 mm
B: 1664 mm

3.5.7. Reorganisation of the container tariff policy

Introduction

Multimodal transportation combines transportation services (transportation of containers or intermodal transportation units (ITU) loaded on wagons, trucks or ships) and logistical services data (handling freight from one transportation mode to the next) regarding the location of the ITU.

Currently, TRACECA compounds:

- an international railway tariff used on routes other than TRACECA,
- domestic railway tariffs applied for domestic runs following the last border point prior to the final destination
- handling tariffs of each terminal,
- ferry-related costs (Caspian Sea) deducted according to wagon-related costs
- trucking tariffs more or less negotiated with the trucking company in charge of transporting containers to the destination terminal,
- possibly container supply costs in the terminal where the freight will be loaded.

Whilst such a situation can ensure that individual interests will be protected, it is non-transparent for customers who are not able to itemise each transportation cost. Such opaqueness impacts negatively the development of multimodal transportation.

Tariff Container Transport Proposal

Multimodal transportation services should be sold as a package deal priced as follows:

- simple tariffs,
- easily applicable and understandable tariffs
- competitive tariffs in comparison with those applied to other single mode transportation organisations or competitive routes.

We suggest a similar set up with specific TRACECA tariffs which would be applied as follows:

TARIFF PER INTERMODAL TRANSPORT UNIT

- 20' or 40'
- According to the weight
- for the 20' container: over 15 tons, between 15 tons and 5 tons, under 5 tons or empty

TARIFF FROM DEPARTURE TO ARRIVAL TERMINAL

- Terminal/terminal: from or to a port terminal selected (POTI towards the Central Asian terminal network selected) to concentrate shipments while integrating the Caspian route.
- Selection of terminals by experts or local authorities

TRUCKING TARIFF

- Lump sum based on trip distance break down (50, 100, 200, 300 km).

For containers delivered or picked up from residences, trucking tariffs varying according to the distances travelled on highways (from 50 to 400 km). This possible option requires an in-depth study of each country with identical trucking tariffs for each terminal distribution area.

IN SINGLE CURRENCY

the tariff expressed in a single currency (US dollars for instance)

WITH INCENTIVES according to:

- quantity
- regularity
- balance

The selection of a national currency can be studied for the trucking. It would however be possible that trucking could be paid for in the reference currency of the single tariff. Encouragement clauses to improve transportation productivity should be introduced through possible rebates according to:

- the quantity shipped,
- the regularity of shipments,
- the weight of shipments in both directions "complete train sets" tariffs should be set as well as tariffs per container lot (e.g. 10' x 20').

If all the participants in multimodal transportation (railway, truck operators, terminal operators, international transport carriers, exporters and importers), agree to apply these principles, a major tariff policy should be set based on the above listed principles.

Three important aspects of this specific tariff policy need to be defined. Active debates with logistics managers should help to clarify these three aspects. However as experts in this field, we should be able to describe the goals to be reached.

1) TARIFF LEVELS

They should be similar to competitive carriers for freight that can be transported by containers using the TRACECA corridor.

The tables at the end of this section shows the current tariff applied on the major routes that are competing with TRACECA towards Western Europe.

Table 28: Break down of tariffs for each segment
Table 29: Comparison of transportation tariffs for a 20' container of approximately 10 tons shipped from the Tashkent region to Paris (Valenton terminal) or Milan (Rogoredo terminal).

The above are not negotiated tariffs, they are approximate prices based on data from various sources from Uzbekistan, Georgia, Italy, Basel and France. It is obvious that the market reality is different, however these tariffs are indications of the tariff policy implemented on the different routes or by the different transportation organisations.

By comparing various competitive routes, we realise that TRACECA is not currently competitive in view of the high volume of sea freight shipped towards POTI. Alternative options should therefore be studied, via ODESSA for example.

We should also reduce container transportation tariffs on the route between Tashkent and Poti. This tariff should be compatible with the cost of each transportation or logistical service included in multimodal transportation. It is therefore necessary that itemised costs be reviewed (I say costs and not anticipated remuneration or current tariffs). After having added the cost of each service, it is still difficult to compare

although we should be able to verify that we are still under the market price or "sales tariff". In order to reach that level, a standard decrease in tariffs should be accepted by all.

2) METHODS OF PAYMENT

2.1. Is money paid to a single entity?

It would be simpler for customers however, it would require that revenue be distributed between the different participants. Therefore there should be an agreement from all the multimodal traffic participants as well as an organisation responsible for distributing the money paid by customers.

2.2. Forms of payment

Who should invoice? Using which rules? When? Which terms of payment ? Which sanctions should be applied if customers do not pay?

2.3. Verification

The methods of payment should also be verified as well as the revenue distribution. They should comply with legal regulations set by the local authorities of each state. (In depth review to be carried out along with local experts).

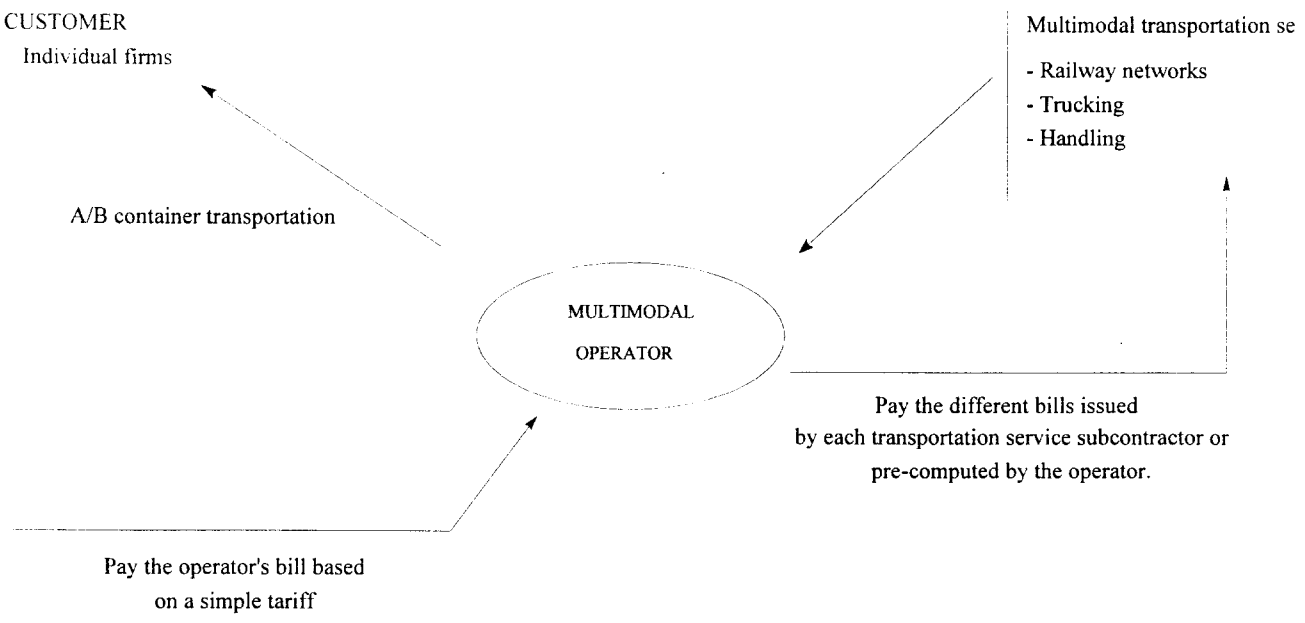
3) REVENUE DISTRIBUTION

If there is no centralised revenue system in charge of covering the bills incurred by each participant, such a distribution can become a major issue which can be compared to the very complicated computing system used by the Railways.

The overall multimodal transportation economic analysis is uncertain for it is broken down into various motivations and balances of each participant who are all looking to obtain a positive profit margin in the end.

We recommend that a single revenue be cashed by a single multimodal operator who would centralise and pay the bills incurred by each participant on the basis of effective services performed. The following chart summarises the proposed financial flows scheme

Figure 10: Financial flows



ACTION PLAN PROPOSED AS A CONCLUSION

1) Obtain the opinion and agreement of local experts regarding the above proposals

2) Organise a meeting of a sub-unit in charge of setting up a tariff policy "construction of a multimodal TRACECA tariff" in order to set up a single and compulsory tariff.

3) Approval of the tariff project and Printing and Distribution.

4) Set up a "TRACECA MULTIMODAL UNIT" and prepare operating regulations along with the different participants.

5) Promote the product and TRACECA multimodal traffic:

- in Central Asia
- in Caucasia
- in Europe

6) Set a deadline

7) Evaluate required funds and profitability:

- Difficult to evaluate. Preliminary conditions required upon start up.

Table 28: Components of transportation tariffs

Tashkent/Western Europe — Estimate in US Dollars

	20' (10 T)	40' (25T)	Wagon 50T
Tashkent trucking 100 km	150	150	
handling	200	200	
/Railway BREST (4236 km)	2000	3500	3500
/Railway CHOP (4764 km)	2200	3900	4000
/Railway RIGA (4286 km)	2000	3400	3800
Transit costs: Brest-Malazwice	60	80	?
Transit costs: CHOP ZAHONY	65	65	?
Transit costs: Riga (port)	150	150	?
Transit costs: POTI	180	180	?
Tashkent/Railway POTI (3100 km approximately)	2100	3150	3150
TASHKENT/Truck BANDAR ABBAS	2300 (1)		
Railway trip ZAHONY/MILAN	425	950	
Railway trip MALAZWICE/PARIS	760	1690	
Maritime trip RIGA/ROTTERDAM	850	1450	
Maritime BANDAR ABBAS/ITALIAN PORTS	1800	3100	
Maritime POTI/ITALIAN PORTS	2650	3500	
ROTTERDAM TRANSIT	160	160	
- ITALIAN PORTS	150	175	
Railway trip between ROTTERDAM / PARIS			
ROTTERDAM / MILAN	410	770	
PARIS/ITALIAN PORTS	725		
MILAN/ITALIAN PORTS	160	300	

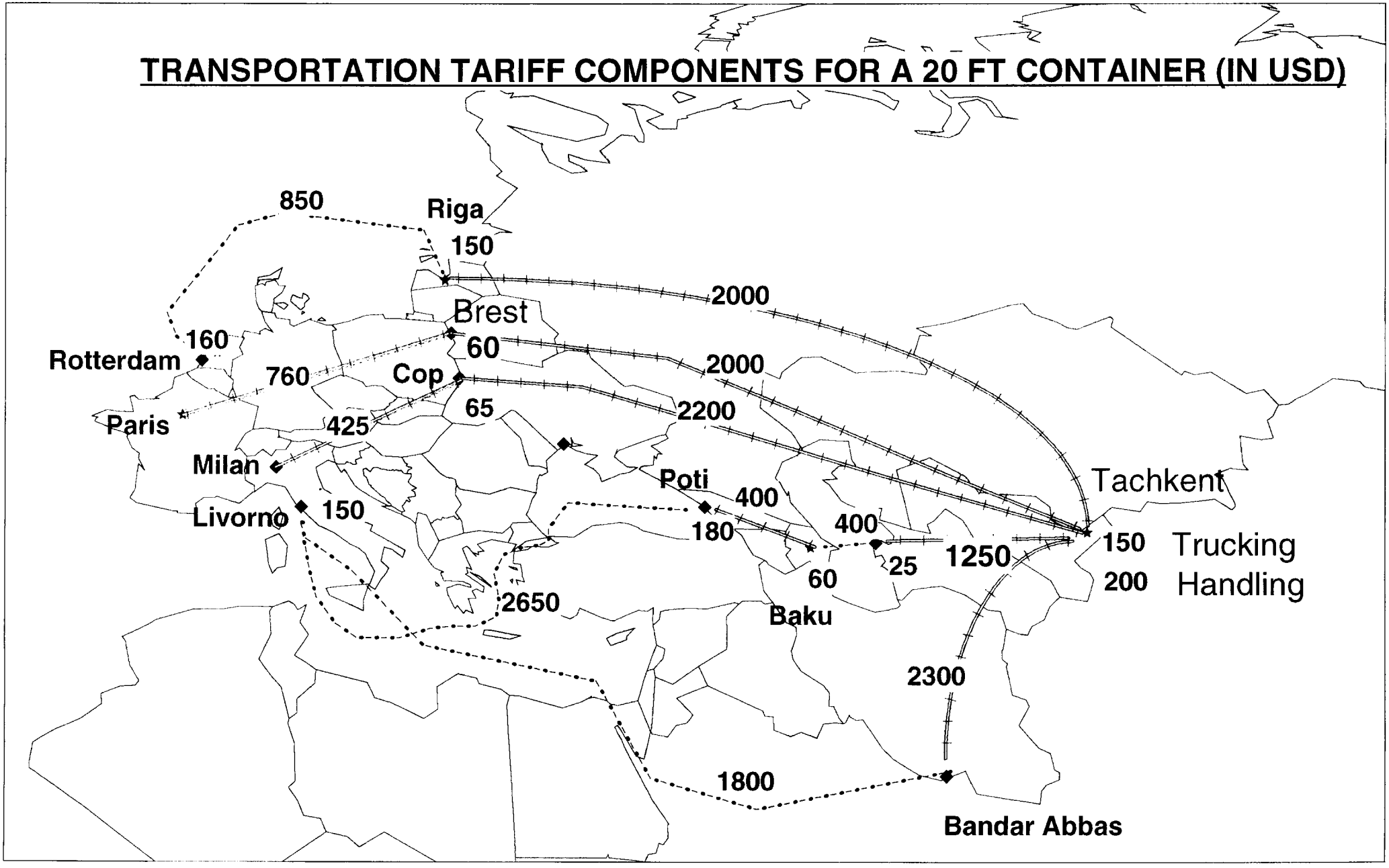
1° Probably reduced to $200 taking into account the price of fuel sold by Italian carriers in Uzbekistan.

Table 29: Comparative analysis of transportation tariffs

For a 20' container weighing 10 tons between TASHKENT and Western Europe (US Dollars).

TASHKENT Milan				
VIA	CHOP	3040	approximate to	3000
	Riga	3920	approximate to	4000
	Bandar Abbas	4410	approximate to	4000
	TRACECA	5590	approximate to	5500
TASHKENT PARIS				
VIA BREST		3170	approximate to	3100
	RIGA	3860	approximate to	3800
	BANDAR ABBAS via Mediterranean ports	4975	approximate to(1)	4500
	TRACECA	6150	approximate to	6000

(1) With incidence on the price of fuel sold by Italian carriers in Uzbekistan


TRANSPORTATION TARIFF COMPONENTS FOR A 20 FT CONTAINER (IN USD)
850
Riga
150
2000
Brest
160
60
Rotterdam
760
Cop
2000
65
2200
Paris
425
Milan
Poti
400
Tachkent
Livorno
150
180
400
150 Trucking
200 Handling
1250
25
60
2650
Baku
2300
1800
Bandar Abbas

3.5.8. The integration of maritime ports

The integration of maritime ports was presented by M. Francou based on the text proposed in section 3.2. of this report.

4. TRANSFER OF TECHNOLOGIES

4.1. Introduction

The section details the results from the activities aimed at transferring intermodal technologies and know how. It consisted of three main components:

- Summary of E.U experience with multimodal transport (Task 7),
- Study Tour in E.U. countries (Task 8 to 11),
- Evaluation of the Study tour (Task 12).

A Summary of E.U. experience with multimodal transport (Task 7) was prepared to set out the key to the success of European countries with intermodal transport, and to facilitate the understanding of the European multimodal systems principle of functioning (as compared to the TRACECA region system).

The Study Tour involved a series of preparatory activities: Technical preparation (Task 8); Setting up an intermodal transport group (Task 9), Practical organisation (Task 10). The technical programme covered the different European organisations, sectors (road; rail; maritime) and facets of the multimodal transport chain as well as technologies and associated logistic related services of multimodal plates-forms (a detailed programme of the Study Tour as well as the list of participants is given in Annex 6). After the Consultant definition of the required profile of the participants (one high ranking decision-maker and one high level specialist per country), an intermodal transport Group was set up to participate in the Study Tour.

The execution of the Study Tour in Europe (Task 11) allowed to ensure a real exposure of Traceca multimodal groups to European Unions practices through a visit to selected multimodal sites and organisations to identify relevant information and training needs. Furthermore, the TRACECA participants created permanent contacts with West European multimodal bodies such as the UIRR[48], the EIA[49] and INTERCONTAINER.

At the end of the Study Tour an evaluation was carried out (Task 12) through a specific questionnaire. The result of the evaluation is summarised in the final section of this part of the report.

4.2. Summary of E.U. countries with Multimodal Transport

4.2.1. Introduction

The term "multimodal transport" corresponds to the carriage of goods by at least two different modes of transport. When a loading unit of merchandise is sent in this manner and remains unchanged throughout the chain of transport, this comes under the term of "intermodal transport". A characteristic of intermodal transport in Europe is the maximum use of rail, waterway or sea so that the distance covered by road at the commencing and terminal points is kept to a minimum. This is known as "combined transport".

Multimodal transport makes the most of the advantages particular to each mode of transport it employs. Rail transport is appropriate for transporting large quantities over long distances whereas transport via heavy goods vehicles (HGV) is pertinent for the collection and distribution of goods over medium and short distances. This means that rail and road modes are not so much seen in competition with each other but rather as complimentary. Furthermore, by benefiting form the advantages of each, multimodal transport responds well to the growing environmental constraints imposed on transportation.

[48] International Union of Rail-Road Combined transport Companies.
[49] European Intermodal Association

4.2.2. Non-accompanied Transport

The most common form of multimodal transport is via containers, swap body (freight carrying units used only in rail/road movements) and articulated lorry. This non-accompanied transport, within which only the loading unit is transported by rail, represents about 80% of the market for combined transport.

Non-accompanied transport requires a whole range of techniques, organisation and infrastructure. This means that transport and consignment companies need to be equipped with special containers which may be transhipped by means of mobile or gantry crane for vertical loading. These road vehicles equipped with swap bodies or in the form of semi-articulated lorries are slightly more expensive than standard lorries. Furthermore, the transport company must be careful that the container which is to be off loaded at the terminal is directed to the correct destination. To this end, a number of companies have come round to either setting up their own office at the other end or entrusting this to another partner.

4.2.3. Accompanied Transport

The Rolling Road is a train that allows a heavy goods vehicle to be carried as a whole along with its driver, hence the term "accompanied" transport. The road vehicle is loaded onto a special low loader wagon via a ramp which is known as horizontal loading. A wagon equipped with sleep-beds is incorporated in the train for the use of the accompanying driver. At the end of the rail journey, the driver recuperates his/her lorry in order to take the goods to their destination.

The great advantage of this is that the driver can rest during the train journey. The duration of the train journey is recognised by legislation in several countries as rest time which allows adherence to restrictions on working hours. Moreover, working conditions are improved by avoiding night shifts.

The Rolling Road trains can be rapidly loaded and unloaded and so are particularly adept to cases where multimodal transport needs to take place in a relatively short space of time. It is a very flexible technique which is accessible to all road hauliers including small companies and occasional users. This is because this method does not require special equipment or adaptation neither on the side of the hauliers, the users nor the infrastructure of the terminals. For this reason, they are often used for short and medium haul transportation (200 to 400 km) as well as for cases where the rotation of trains needs to be quick. Given these facts, the Rolling Roads technique could be the answer to multimodal transport in Central and Eastern Europe.

However, there is a downside to this system. The principal inconvenience of the Rolling Road is that, in addition to the goods, the whole of the lorry needs to be transported as well. Also, the height of the wagons needs to be 40 to 50 cm greater than the norm, which may cause problems with existing transport infrastructure (height of bridges, width of tunnels). Thus, where fully equipped terminals are available, the practice of accompanied transport is less economically efficient than non-accompanied transport.

4.2.4. Rolling Stock

Road hauliers are not alone in investing in multimodal transport. The need for appropriate rolling stock is indispensable for the system to be economically viable. The railway companies are currently equipped with several thousand wagons designed for the transportation of different types of loading units. Furthermore, a good number of multimodal firms own sizeable private wagon stocks. These include low loader wagons used for the Rolling Road, pocket wagons which have recessed pockets to accept the road wheels of semi trailers and swap bodies, double stack wagons which carry containers on two levels as well as non-accompanied types of containers and swap bodies.

4.2.5. Freight Villages

An appropriate set-up is required for the practice of non-accompanied transport. Large sites known as freight villages have evolved which include a terminal along with the necessary administrative facilities associated with goods handling. A dense freight village network has emerged in the most parts of Western European states and this continues to develop. The presence of a terminal has not necessarily been the result of heavy financial input. A mobile crane is sufficient for a start although the largest terminals generally work with gantry cranes.

4.2.6. The Railway Operators and Companies

Multimodal transport relies on the expertise and the co-operation of different parties. The railway companies provide the network and rolling stock along with necessary staffing. The operators buy the rail traction from them. The acquisition of wagons is shared between the railway companies and the operators. The terminals are run by the railway companies in conjunction with either the operators or private local users. The operators establish their services based on these elements and market either the whole of the loading chain or the terminal traffic to carriers and forwarding agents.

Over the past few years, more and more transport for swap-bodies and articulated lorries has been offered to road hauliers. The creation of multimodal transport companies structured on a co-operative model roots from an initiative taken by agents and transport companies as well as their federations.

The national railway companies only own a minor part of the capital. At present, more than 1000 transport companies and agents, often small and medium enterprises of which many have heavily invested in multimodal transport, have joined the 17 companies belonging to the International Union of Combined Rail-Road Transport (UIRR). The members of UIRR organise and market the transport form terminal to terminal by rail. It is the road haulier who sees off the merchandise at the terminal and who will see that a handling company or a partner at the arrival terminal will dispatch the goods to the client. It is the transport hauliers and marketers themselves who mastermind the transport system, investing in equipment such as swap bodies and liftable articulated lorries. They also participate in the financing of the UIRR members, thus contributing in the development of activity in multimodal transport. The organised co-operation between road and rail is the principal foundation of the success that the multimodal transport groups are bringing about.

There also exist several private operators who take part in multimodal transport on their own accord. These tend to concentrate on certain categories of goods, such as chemicals and cistern tanks, or offer haulage capacity on multimodal trains to a third party.

The railway transport market is becoming more liberal. The original principal established that containers were only to be transported by either container firms or railway companies and that lorries and their loading units only by multimodal transport companies. This practice is beginning to die out with the growing presence of operators in all sections of the market. However, complex questions result over the matter of monopoly rights. For example, the members of UIRR are in competition with the railway companies who are their exclusive suppliers.

In most of the European countries, the railway companies come under private law. The railway legislation 91/440 obliges all EEC members to reduce the debts of the railway companies and guarantee them a management system separate from the state. These two measures have radically changed the outlook for railway transport.

It is the responsibility of the State members to ensure the obligatory separation of the railway operation and the rail tracks as well as overseeing the option of institutional separation. With respect to the transport sector of the railway companies, this needs to intervene on the market side as an private company, whilst the railway network comes under national management of the concerned States. It is these two groups which will cover the financial costs of infrastructure and who will deduct fixed user prices in function of distance, train composition and other criterion (speed, axle loading, etc.).

Within the international multimodal transport sector, all the railway companies, including the private companies recently formed, will be able to have free access to the whole of the European railway network. The multimodal transport as such is in a unique position given that, for the rest of the passenger and goods traffic, the railway companies themselves can only offer the use of railway infrastructure in their originating countries.

Even through the aims are clear, it is difficult to imagine the precise structure of railways in the future. One thing is sure however: multimodal transport is called to play a key role in the development of goods trafficking.

4.2.7. The Haulier's Choice

Multimodal transport is generally accepted for its environmentally friendly aspects. However, this fact alone will not convert more than a few companies and transportation agents to this technique. Although the loading scene does not benefit form any environmental bonus, multimodal transport brings economic advantages which constitutes the determining factor for a haulier company.

Multimodal transport, whether it be in the form of accompanied or non-accompanied transport, helps the companies to lower their variable costs of petrol, tyres and vehicle maintenance. Furthermore, the vehicle life is prolonged and the vehicle stock can be diminished as a consequence if the company invests in the appropriate multimodal transport equipment.

The savings made on staffing costs should not be underestimated. By switching to multimodal transport, a company can transport greater quantities of merchandise for the same number of staff. Given the current strict legislation on the subject of rest and driving time, a single driver can only make up to 700 road km in one particular day. Checks on driving and resting time will become more rigorous over the course of the next few years.

Many firms are now sending dangerous goods by rail or water way wherever every possible. The more dense the transport network becomes, the more companies are trying to send their goods by rail.

It is not unusual to find companies who, because of time saving on round trips, have had a 20% augmentation in goods transported with the same number of personnel and overhead costs. Still more companies have found damage to goods is notably reduced when using multimodal transport. However, there needs to be the assurance that the transport cost by rail does not grow more rapidly than that of road so that companies will be at less risk when investing in multimodal transport equipment.

4.2.8. Operational Aspects

From the point of view of the hauliers and rail companies, the direct train is the most advantageous because it is highly cost saving in terms of manoeuvres of wagons at the railway terminals. For this same reason, these trains are very reliable which is a must when dealing with "just-in-time" operations. Wagons are added or taken off at the terminal in function of required capacity. The navette trains are a special variety of direct trains: their composition is fixed.

Next to the direct trains, the grouping trains constitute the base of the multimodal network. They are trains made up of goods headed for two or more destinations. The groups of wagons are swapped between trains at the rail depots to form new trains with one destination. The nodal points or "hubs" allow a particularly advanced form of train. The principal railway operators adopt more and more the solution of nodal points for technical and quality reasons.

Certain criteria must be taken into account when road vehicles with their unit load use the rail in the form of multimodal transport. The usual dimension of rail wagons is superseded. The upper limit for the height and the breadth of unit loading is defined in the rail dimensions. This is restrained in certain conditions when encountering tunnels, bridges and even the roofs of stations. The draft of all the unit loads used in

multimodal transport is thus coded by means of a yellow panel which informs the train driver of the dimensions of their unit loading. These permit the differentiation of loading units. The dimensions of all the rail link infrastructure are known. As a general rule, there are few restrictions for the containers and the swap-bodies. Even the alpine tunnels have been enlarged over the past few years in such a way that the articulated lorries used in multimodal transport can take them. It is the "jumbo" containers that continue to cause a problem and generally the British articulated lorries. As for the Rolling Road which permits the loading of whole lorries, this only exists in countries where the present network has an adequately dimensioned infrastructure.

Multimodal transport is in principle apt to transport all goods which would otherwise be transported over long distances by road. In practice, only the goods with specific requirements of strict time limits are restricted. Goods which need to be transported under controlled temperature (i.e. refrigerated) are mainly sent by fast and direct trains. "Green" freight, that is to say fruits and vegetables, have other rules: they must often be delivered by 04.00 a.m. in markets, a time that does not correspond to a previously practised timetable. On a positive note, it is better to transport dangerous goods by rail as the safety records of rail are much better. Over the last years, legislation has rendered the conditions of the transportation of dangerous goods more strict. The higher the safety requirements on the road are enforced, the more goods will be assigned to multimodal transport.

Several criteria come under consideration over the acceptability of multimodal transport. One of these is timetabling. The timetable plans in most demand are, on a national scale those of type A/B -leave in the evening, arrive the next morning - and internationally, those of type A/C - unloading the following day. Thus, multimodal transport takes advantage of night time travel which allows the carriage of goods to their destination in time for processing the following morning.

More often than not, the demands of the client represent a difficult task for the railway companies who need to fit these into their plans. The same goes for the operators who must make the offer to the client and, in most cases, provide the wagons. Not every demand of the clients can be satisfied. One major factor is that freight traffic must share the railway capacity with passenger traffic. Added to this are stoppages for technical reasons such as the change of locomotives at borders required because of different electric systems.

The need for international links in multimodal transport is becoming more vital with the growing integration of Europe. In correspondence with that which has happened with passenger travel, real quality offers are being developed for stronger links across Europe.

4.2.9. Offers to the Client

Multimodal transport is in an ever-continuing process of diversification and orientation towards the needs of the client. Performance links are now offered even for the furthest destinations.

Multimodal transport has seen important development over the past few years between the largest port in the world Rotterdam and its hinterland. This primarily concerns rapid transport of containers by rail. The direct train destination Prague is one of the most recent trains in service. In mid-May 1995 a shuttle train was put into service following A/B plan between Rotterdam and Switzerland. A multimodal set-up consisting of a train link between Rotterdam and France, Spain and Italy, has been operational since the end of June 1995. This train called the "Mediterranean Shuttle" circulates 5 times a week both ways. This offers transit times within 24 hours for Spain as well as for Central and Southern Italy.

Hungary is on the way to transferring a considerable part of its traffic to rail. Between Wel (Germany) and Szeged (Hungary) some 25 000 road trains took the Rolling Rail in 1994. Hungary is well equipped with ports situated at the North Sea, Brême and Hamburg. The Hansa-Hungari-Container Express which carries almost all types of containers offers branch trains from the Hungarian terminal to countries such as Romania, the Ukraine, Greece, Bulgaria and Turkey.

These are examples of multimodal transport systems that have been set up whenever potential markets permit.

4.2.10. Mobilisation Constraints

The European transportation market is in full growth. The exchange of goods and the resulting demand in transport services are growing even more rapidly as trans-border economic activity intensifies. The abolition of the iron curtain at the end of 1989 has furthermore accelerated traffic growth. The experts estimate that international transport will have a 60% growth rate over the period 1988 to 2010.

The traffic however is being presented with more and more constraints. Transport infrastructure is desperately saturated and traffic congestion is part of every day life in all European states.

In response to this, a number of states are taking great measures to compensate for deficiencies in infrastructure. In 1994 the European Commission put forward a plan of action under the title of Trans-European Network (TEN). This defines the principle projects of the Community on the subject of infrastructure and co-ordinates the adopted measures through the different State members. Pressure will continue to be applied for the financing of the modes of transport which best respect the environment, that is to say rail and waterways.

Moving on from the financial problem comes the acceptability of traffic politics. Today, it is not possible to just decide to pump financial resources necessary for the construction of infrastructure projects. The people of the European states are less ready to accept the construction or the extension of infrastructure on a large scale. Opposition on all sides lengthens the planning time table.

Along the same line, there is a greater public awareness of the fact that growth of traffic has damaging effects on the environment. Traffic has been defined as one of the determining factors of the greenhouse effect. The European Office of Statistics, Eurostat, estimates that the consumption of crude oil in 1988 solely by the transportation sector in the European Community lies at 211.5 million tonnes. This represents 30% of the total energy consumed by these countries. It is road transport which far outstrips all other modes consuming 84.4 % compared with 2.5 % for fluvial and 2 % for rail. In the mean time, the most industrialised states are committed to the reduction of harmful gasses into the atmosphere. Concern resides mainly over carbon dioxide emissions because of its links with the greenhouse effect.

Pollution is not the only inconvenience caused by traffic. Scientists have endeavoured for several years to evaluate the whole of the damaging effects of traffic and to gather these under the term "external costs". From the calculations of the OECD (Organisation for Economic Cooperation and Development), the global economic cost of road traffic - that is to say atmospheric and sound pollution, traffic congestion and accidents - would in itself attain 5% of GDP (gross domestic product).

It is clear that any methods of action to be adopted need to ensure a mobility system which respects the environment. The necessity of associating different modes of transport and integrating them in a global concept is becoming obvious as traffic congestion becomes a more pressing matter. The European Commission, however, sticks to solutions which conform to the marketing laws. So, it is not a question of looking for directives from above. The optimal solution must result from different forces present in the market. The policies decided upon will have to determine and influence the conditions of competition in a way that all the modes of transport contribute fairly to the social costs of infrastructure which concern them. Until this point can be guaranteed, public support will be necessary for certain modes of transport to develop.

The turning of Europe towards multimodal transport does not in any way signify that competition between the modes of transport will be excluded. Nor does it mean that the lorry will be excluded from the market. Quite the opposite. It is in the nature of multimodal transport to bring together the use of different modes of transport. This is seen by the fact that it is precisely the companies and marketers of transport as well as their respective organisations who have participated and will continue to participate towards numerous European companies of multimodal transport.

4.2.11. Promotion Measures

Multimodal transport is presented by international transport policies as potentially the most beneficial. It is with this vision that the European Commission has established a multimodal European network which is of

great community interest. Moreover, a series of legal measures have been undertaken over the course of the last years in order to improve the framework conditions of multimodal transport. This support towards transport policy aims to compensate multimodal transport for the contribution in capital that they bring in the form of reduction of social costs. These include the reduction of costs borne by the economy following accidents causing damage to the environment. Whilst pushing for all modes of transport to pay for social costs they cause, the European Commission feels that it is necessary to promote multimodal transport. It has therefore brought in a series of measures to compensate for inconveniences intrinsic to multimodal transport. This is known as compensation for disadvantage.

The companies who use multimodal transport can, in most countries, economise on transportation tax. A company which uses multimodal transport lessens the road congestion of infrastructure it otherwise might have caused. This goes against equality in treatment if this company must support the costs of road use (taxes on vehicles, petrol and road tolls) as well as the costs of the use of a second mode of transport. This haulier thus acquires the right of reimbursement of the taxes corresponding to the non utilisation of road infrastructure. The sum of this tax reimbursement is a function of the number and the length of journeys made with multimodal transport. Another measure is the exemption of prohibition of running times (weekends, public holidays) or, in the case of the Rolling Road, the recognition of the rail travel time as resting time for the lorry driver.

The possibility of introducing public means of investment in multimodal transport is of great importance. This would include, for example, the purchasing of wagons or other specialised equipment necessary for complete multimodal set up. In certain cases the European Union authorises the Member States to subsidise the running costs over the course of the introduction of a multimodal project. It is quite an exception that the European Commission has established regulations authorising state aid towards multimodal transport development. Normally, the principle of community backing is to eliminate in all measures possible state aid.

Apart from the European Commission, there are other institutions from the European Union structure which are committed to multimodal transport. Also, the UN has stated in the document "European Agreement on Important International Combined Transport Lines and Related Installations" the primary objectives on the subject of multimodal infrastructure. This document includes the augmentation of average speed for multimodal trains to 100 to 120 km/h. Taking this further, this document rules that the length of trains can be 600 to 750 metres. There is further discussion on the increasing of permissible loading.

4.2.12. Development and Perspectives

The success of multimodal transport will depend on commitment to its development. For years now, the technique of transhipment has been the subject of intense research and alternative solutions are already being implemented. The aim is to achieve the transhipment of one mode of transport to another as automated as possible, directly from one train to another, in the same way that rail passengers make connections.

Over the last few years, research has been going on into what is known as bimodal systems. This technique is already being used in the USA with the "Road-Railer" or rail-road. During the rail journey the articulated lorries are supported by bogies which transform them into a sort of "wagon unit" for transport by rail. Upon reaching the destination terminal, the articulated lorries are separated form their bogies. The trailer can thus continue its journey without a great loss of time. This system is also well adapted to traffic which is unequal in different directions. The bimodal system is only being slowly introduced in Europe. A direct service between Munich and Verona was opened in 1995 with the support of the European Union.

Loading units (containers and swap bodies) are also in the forecourt of technical development. The aim is to improve the swap body which, as freight carrying units, are not strong enough to be stacked. A growing number of transport companies and agents rely on "Jumbo" and "Mega" crates to send bulky goods. In order to be able to integrate these at a later stage with other intermodal chains, there is more and more call for the crates to be technically adapted. The possibility of stacking the crates in the same way as containers is another part of the idea.

It is no longer possible to imagine multimodal transport without modern computerisation techniques. Given that the physical transport of goods is considered more and more by industry as being an integral part of production itself, the information concerning the transport must be available as quickly as possible. Modern information technology allows the merchandise to be followed throughout its journey. This is possible thanks to automatic identification which, in the USA, already takes part in railway companies. This technique will also be introduced in Europe with pilot studies being currently undertaken by several railway enterprises and hauliers.

The European Commission supports the development of multimodal transport through different promotion programmes of which the pilot programme called "PACT" (Pilot Actions for Combined Transport) is part. The aim of this programme is to make intermodal transport even more efficient in the short term, by helping the existing techniques in the domain of transhipment, information technology and telecommunications to be introduced on site.

The progress that has taken place up until now is most encouraging. As multimodal transport includes such a wide range of demands and techniques any development calls for a united effort from all concerned parties. In this way, long term growth in the multimodal sector will be able to respond to transportation problems.

4.3. Study Tour in E.U. Countries

The Study Tour was carried out during the 15 - 27 June 1996. The activities performed involved the following organisations:

International European Multimodal Organisations.

- The INTERNATIONAL UNION OR RAIL-ROAD COMPANIES (IURR) and INTERCONTAINER (ICF): the two European Combined Transport competing groups (The UIRR is the Combined Transport Group dominated by the road hauliers and their federation, while INTERCONTAINER, the second largest competitor, is dominated by the railways companies).
- The EUROPEAN INTERMODAL ASSOCIATION (E.I.A). The EIA forms the European structure which promotes the components of the intermodal products (techniques, equipment, organisation of the chain and the definition and creation of supply).

Multimodal National Authorities and Professional Unions.

- Combined transport Authorities from the FRENCH MINISTRY OF TRANSPORT

  The « GROUPEMENT NATIONAL DE TRANSPORT COMBINE » (GNTC) . One of the largest French Professional Union.

The Maritime Facet of Combined Transport

- PORT OF HAMBURG,
- The Hamburger Hafen-und Lagerhaus-Aktiengesellcshaft (HHLA),
- Container Terminal division of HHLA at Burchardkai,
- « POLZUG » a German-Poland joint venture company specialised in Combined Transport.

European rail « Nodes »

- The « European Nodal Point » managed by INTERCONTAINER. Metz (France).

Regional multimodal platform

- Visit of the Multimodal regional Complex of Avignon, managed by NOVATRANS

Rail-road terminals

- The Hamburg-Billwerder Combined Transport Terminal managed by « KOMBIVERKEHR »,
- The Combined Transport of Creteil managed by NOVATRANS.
- The Combined Transport Terminal of Valenton (France), managed by the SNCF and the CNC (Compagnie Nouvelle de Conteneurs).

The Road Facet of Combined Transport

- The medium size French transport company « T.A.V », specialised in Rail-Road Transport by swap bodies (90 % of the Traffic).
- CALBERSON- Grand Export » the largest French forwarding Company, with multimodal activities throughout the world.

4.3.1. International European Multimodal Organisations.

4.3.1.1. The « INTERNATIONAL RAIL-ROAD UNION » (UIRR).

The IURR responsible for Marketing and European affairs, Mrs Susanne Kuschel presented to the participants the structure, the role, the activities and the position of the UIRR in the combined transport market.

With a traffic of 3.7 million TEU (Twenty-foot Equivalent Units), which represents more than 50% of the total European combined transport output, the IURR is the largest group of combined transport in Europe. Members of the UIRR are present in 17 countries in Europe. Their clientele is strongly oriented towards the road sector. In most cases, the UIRR companies are the largest operators in their respective countries and to fulfil their role they generally own their wagons and run the terminal they serve. A KOMBIVERKEHR terminal, in Billwerder (Germany) was visited to illustrate the presentation of the activities of IURR members.

Transport by container[50] and swap-bodies[51] (the dominant techniques within the IURR) represents two-thirds of the total number of consignments, while transport by semi-trailers[52] lies at 16%. The annual average growth rate of traffic is nearly 3%. More specific data show that the international traffic of the UIRR companies largely exceeds national traffic. International traffic is growing by 14% a year. The average distance for multimodal transport, national and international, is 755 km. (Brochures describing the company and its activities were distributed to the participants)

4.3.1.2. « INTERCONTAINER »

The presentation of INTERCONTAINER was carried out during a conference held in Metz, by the Director of the Business Unit Central and Eastern Europe, Mr Peter Schmelter and the Route Manager, Mr Andrej Burnashev. After the presentation of INTERCONTAINER activities in Europe as well as in Central Asia and Caucasus, the principle of the "nodal point" was explained to the participants, as well as the information systems "Euronet" and "Qualitynet", which are used as aids in international traffic operations. Established in Belgium and having its main office in Basel, Switzerland, INTERCONTAINER is owned by 26 railway companies. In 1994, INTERCONTAINER transported 1.3 million TEU. The average transport distance is 1000 kilometres. (Brochures describing the company and its activities were distributed to the participants)

The presentation was followed by a discussion between INTERCONTAINER representatives and the participants on the possible involvement of INTERCONTAINER in Central Asia and Caucasian countries. Mr Schemelter explained that INTERCONTAINER, working in a competitive market, is open to anyone who desires to become a member, under three conditions:

- to have an operating railway network,
- to accept the operating methods and concepts of the company, and,
- to participate in the capital of the group.

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[50] There are " land containers ", maritime containers and air container. Land containers are designed for an optimal use in rail-road combined transport (standardised according to International Railways Union norms). Maritime Containers are designed to be used in a cellular ship and are conforming to International Standard Organisation (ISO standards).

[51] Used only in rail-road movements.

[52] Any vehicle intended to be coupled to a motor vehicle in such a way that part of it rests on the motor vehicle and a substantial part of its weight of its load is borne by the motor vehicle. These may have to be specially adapted to be used in combined transport.

Further contacts and discussions were planned. Mr Schmelter was invited to visit the region and discuss the conditions under which INTERCONTAINER could be involved in the development of the combined transport market in the TRACECA region.

4.3.1.3 the « EUROPEAN INTERMODAL ASSOCIATION » (EIA).

The General Secretary of the EIA, Mr Bernard Teillet, presented the EIA : the structure, objectives and activities of the Association. Created two years ago by the railways and road operators, the EIA is composed by 26 active members from the combined transport groups (IURR and INTERCONTAINER), from other partners involved in the multimodal business such as equipment dealers, insurance companies, banks etc. The EIA have been created to promote exchanges between partners, to detect productivity gaps, to optimise transport costs and to constitute a professional entity able to influence the official authorities on the financial contributions required to promote this technique.

The EIA strategy for reducing operating costs is focused on three main components:

- reduce the rail traction cost which represents 30% of the total cost of combined transports by the introduction of « Block Trains » techniques in replacement of traditional A to B traction by individual wagons through successive shunting.

- reduce rail terminal operation cost by compressing the cost of haul operations, representing 35% of a combined transport operation. This can be achieved, explained Mr Teillet, by reducing the number of trucks affected to this mission and by doing trucking operations more flexibly in terms of schedule: the terminal haul operations could be spread over the day instead of concentrated in narrow intervals (from 6h to 8h and from 18h to 20h).

- The third component of the strategy consists of reducing the handling operations costs by increasing the automatisation of terminals and by reducing personnel costs, rather high in Europe.

Another subject of particular interest for the participants was the Mr Teillet's explanation of the functioning principles of the Association: the EIA has a small permanent structure, essentially composed of himself and of various working groups from the different member companies. To support the cost of the functioning of the EIA, all members provide a fixed amount of about 2000 USD, plus a contribution varying from 400 to 4000 ECU according to the turnover of the company. It was noted that the working groups are not paid by the EIA, but work on the basis of their own company interest. Regular meetings are organised to review the progress of the work performed by these working groups.

Finally, Mr Teillet explained the various financing systems contemplated in Europe through the PACT programme[53]. The programme can finance up to 50% of the cost of project feasibility studies and 30% of the costs of project measures. The programme has been successful and the European Commission is now studying how to transform this pilot programme into a longer term and large scale Community programme, including Eastern countries.

4.3.2. Multimodal National Authorities and Professional Unions.

- Combined transport Authorities from the FRENCH MINISTRY OF TRANSPORT

- The « GROUPEMENT NATIONAL DE TRANSPORT COMBINE » (GNTC) . One of the largest French Professional Union.

[53] PACT: Pilot actions in the Field of Combined Transport. Initiative launched by The European Commission to bring about a lasting improvement in the quality of combined transport. Projects financed by the Commission must cover international routes of European interest and may concern any combination of rail-road or inland waterways transport and may include sea crossing where this is unavoidable.

4.3.2.1. Meeting with Representatives of the FRENCH MINISTRY OF TRANSPORT

The representatives of the French Ministry of Transport offered the opportunity to clarify the role of the authorities on the functioning of the Combined Transport Sector. The Conference was headed by the Director for International Economic Affairs within the Ministry of Transport, Mr Mousnier-Lompré. Jean Michel Etienne, author of various works on the financing of public infrastructures by private funds and Mr Maurice Belmain, responsible for Multimodal transport policy within the Ministry, presented an overview of Combined Transport issues in Europe.

Of particular interest for the participants was the Mr Mousnier-Lompré's presentation on the role and structure of the French Ministry of Transport in the combined transport sector. Some of the delegations, in particular from Azerbaidjan, Georgia and Tadjikistan showed a great interest in possible assistance to strengthen their respective Transport Institutions are one the most important weaknesses the development of appropriate transport policies. Mr Sadihov, the Head of the Transport sector in Azerbaidjan, noticed that institutional support is a national priority for the country. This matter has been chosen by Azerbaidjan to be included in the EU "Indicative Programme" for assistance.

Mr J.M. Etienne presented the French system of financing public transport equipment by private funds. He explained how, by contractual agreements, French private firms participate in the financing of the infrastructure: in return for their investment, the private sector is compensate by keeping under autonomous control the operation and management of infrastructures. A 200-page book, in Russian, specifically dedicated to this matter was provided to the participants. (A copy may be made available by the Team Leader).

Mr M. Belmain presentation was focused on the main reasons of developing the combined transport network in Europe, from the point of view of the authorities. He explained the technical difficulties encountered in the development of combined transport, in particular in the field of technical norms (infrastructure, vehicle fleet and service standard). He said that a large variety of existing standards and parameters for combined transport road-rail in Europe, create obstacles in developing harmonised transport system. A recent ECE[54] study which makes an inventory of the existing standards in Europe, shows, on an internationally comparable basis, the actual situation as compared to the minimum standards and parameters prescribed in the "European AGTC[55]. This 130-page document was provided to the participants (a copy may be made available by the Team Leader).

4.3.2.2. The "GROUPEMENT NATIONAL DE TRANSPORT COMBINE"(GNTC).

The General Secretary of the GNTC, Mr Jacques Rossi, presented the GNTC: objectives, structure and activities. Of particular interest for the participants was the role of these types of professional Unions. The GNTC is one of the two representatives of French Professional Unions created by road hauliers to preserve and defend the interests of the members in the combined transport business. The working methods is similar to the one of the EIA.

Following Mr Rossi's presentation, the Team Leader and actors the Operating Expert summarised the role and positions of the different actors involved in the combined transport business. Two different levels may be distinguished:

- At the "policy level", there are two main actors: the Ministry of Transport, authority in charge of defining the rules of the game and the Professional Unions, such as the "GNTC", emanating from the profession to defend the interests of any specific sector. To facilitate the discussions which preceded the main decisions to be taken by the authority, individual firms, represented by a valid body, can influence the authorities decision.

- At the "operating level", the actors are individual firms and large groups of economic interest. For instance, economic interest companies such as NOVATRANS, (a IURR's member) are created to meet the need of grouping transport operations and creating infrastructure (this can not be assumed by individual firms). Furthermore, a group of economic interest such as NOVATRANS can offer to individual firms the

[54] Economic Commission For Europe of the United Nations.
[55] European Agreement on Important International Combined Transport Lines and Related Installations

possibility of being in a stronger position when negotiating with large suppliers such as National Railways Companies: by evaluating the transport needs of individual firms, NOVATRANS is able to buy rail traction on a basis of the wholesale price. By reselling these services to individual firms (on a basis of attractive retail prices) they make a profit. The benefits allow the group NOVATRANS to reinvest the profit and finance the infrastructure. They fulfil their role by being a sort of "freight transport wholesaler".

4.3.3. The Maritime Facet of Combined Transport

4.3.3.1. The Port of Hamburg (Germany)

The visit to the Port of Hamburg and the HHLA container terminal at Buchardkai (Hamburger Hafen-und Lagerhaus-Aktiengesellcshaft) offered the possibility of understanding the maritime facet of combined transport in EU countries. The extensive tour of the harbour in the "Senatsbarkasse" boat was conducted by the General Manager of the Container Division of HHLA, Mr. Winfred Furnell, and the Executive Manager, Mr. Rainer Boller. They presented the main infrastructure of the Port as well as the main activity including economic indicators, the status, the organisation and the main actors concerning the port, etc.

Hamburg, the largest industrial city in Germany, is now located at the transport hub of a market with more than 400 million inhabitants. About 60 % of the traffic is coming from or to going to the city or its hinterland. The port of Hamburg registered a traffic is 65 million tons per year. While the general cargo traffic is decreasing, the container traffic is rapidly increasing. Since 1985, the container turnover has doubled. In 1995, a total of nearly three million TEUs puts Hamburg in the seventh spot in the world container port league. Hamburg's port economy expects container turnover to exceed four million TEUs but the year 2000.

The port has an essential role on three types of traffic : between Europe and the Far East where its hub role is increasing (about 45 % of the total container traffic) and to or from the Scandinavian countries (about 15 % of the total traffic). New emerging market from Eastern Europe is a major commercial prospect. Institutionally and legally, the port of Hamburg depends on the Land of Hamburg. Its management is largely performed by Ministry of Commerce of the Land of Hamburg (Wirtschaftsbehorde). Traditionally, the handling is performed by two corporations: BUSS and Carl Tiedeman for cargo handling operations and the operators for the land handling. The development of the container traffic is abating the difference between these two professions.

4.3.3.2. The Container Terminal of Burchardkai (Germany)

After the Port, the delegation visited the Container Terminal of Burchardkai. This terminal managed by the Hamburger Hafen und Lagerhaus (HHLA), is one of the two HHLA container terminals . With a total traffic of 1.2 million TEUs[56], HHLA is one of the largest operators of the Port of Hamburg. This is about 60% of the total container traffic of the Port and 54% of the general cargo. The terminal operated by HHLA is equipped with container berths totalling 2,570m length, depths 9.8m-15m served by 16 container gantry cranes (35t-70t), one quarter ramp and one stern-ramp RO/RO facilities. It comprises: 16ha (container parking 79ha); storage facilities 14,600 TEUs. Rail facilities : terminal of 5.4 ha with six tracks totalling 2,400 m served by three rail-mounted Peiner (38t) and two Aumund (35t) road/rail transfer gantries. The freight handled represents 84% of the total traffic.

4.3.3.3. The German-Poland joint venture « POLZUG ».

In a second part of the visit to HHLA, a main firm involved in the rail container business was presented: The company POLZUG, a joint venture created by the Polish Railways (40%); the HHLA (40%) and EgonWenkInteranational forwarders as well as KOMBIVERKEHR (20%). The « POLZUG » activities were described by the management of the company: Mr Walter Schulze and Mr Manfred Schmidt.

[56] TEU: Twenty-foot Equivalent Unit (6.10m). A standard unit for counting containers of various lengths and for describing the capacities of container ships or terminals. One standard 40' ISO Series 1 container equals 2 TEUs

Of particular interest was the presentation of the new Block train from Slawkov to Kiev (starting in July 1996) supported by the government of Germany. The participants express the desire of connecting Kiev to Odessa (Poti is connected to Odessa by ferry). POLZUG management said they would pay attention to possible developments in this direction. It depends on the traffic.

4.3.4. The European rail « Node » of Metz

The visit of the "European Nodal Point » managed by INTERCONTAINER was directed by Mr Kieffar, Director of the Centre. The principal of the "Nodal Point » of Metz (France) was explained: at strategically favourable location, wagons from multi-group trains (trains from various origins, with shipments for two or more destinations) are exchanged and combined to form new, single-destination through trains. The choice of Metz to build a « Node » was explained as a result from its central position in connection with North-South traffic flows: Rotterdam - Italy; Germany-Spain. At this central point, multi-group trains from the North of Europe and going to different regions in Italy are formed to directly reach the specific final Italian point of destination.

The particular train building includes a sorting area composed of 40 rail track sections. Sorting operations for a specific train are performed in 15 minutes. This explains the importance given to the information systems. Some time before the train arrives in Metz, a list of wagons is faxed from the terminal of origin. With this list in hand, the INTERCONTAINER operators instruct the railway company (SNCF) on the required sorting operations to be performed. At the same time, the same information is also transmitted to the Head Office in Basel. The centralisation of all information related to a wagons position allows INTERCONTAINER to keep their customers informed in real time. The information system is called "Euronet".

Particularly interested by this information technique, the participants had a discussion with INTERCONTAINER management on the possibility of using such type of system. Mr Schmelter explained that It is necessary to specifically define the field of intervention of INTERCONTAINER: conditions under which the transport operation is performed, origin and destination points, commercial conditions (FOB or CIF). To clear out these possibilities, representatives from INTERCONTAINER were invited to pay a visit to the region.

4.3.5. Multimodal Regional Platforms and Terminals

4.3.5.1. The Regional multimodal terminal of Avignon (France)

The visit of the regional multimodal terminal of Avignon, managed by NOVATRANS (member of the IURR), was directed by Mr Claude Arocas, Regional Director. Mr Arocas presented the role, the capital structure, the market and the equipment of NOVATRANS. The group capital structure is dominated at 60% by the profession of road carriers (40% of the capital belong to the National Railways Company). With its own 19 terminals, 15 mobile gantry cranes and 1000 rail-wagons, NOVATRANS is able to link 200 terminals in Europe. Connections are performed by 60 trains per day running at speeds of 120 km/h.

Of particular interest was the presentation of the role and position of NOVATRANS in the combined transport market. In France, like in most European countries, there are two national competing operators: NOVATRANS (dominated by the road profession) and the Company Nouvelle de Conteneurs, the CNC (dominated by the railways sector). These national companies are represented at a European and international level by the IURR (dominated by road companies) and INTERCONTAINER (dominated by national railways companies).

Essentially, the difference between the two kinds of operators resides in the nature of the services offered. NOVATRANS mainly operates in the continental market and does not provide door to door services (the trucking from the terminal to the users premises is performed by road carriers). On the other hand, the group dominated by the railway companies, such as CNC in France, are able to provide door to door services, including the provision of containers, and the terminal haulier by road with its own means. In both cases,

their role consists of offering solutions to road carriers (alternatives to "pure road transport" in the long-distance market) and, at the same time, provide freight traffic to railways companies.

During the last 25 years, the traffic handled by road carriers has been increasing dramatically to the detriment of the railways. Today, road infrastructures are congested and air pollution from road transport is high. Furthermore, the consolidation of the European market creates an advantage for trade over longer distances where railways are more cost-efficient. There is a real desire in Europe to find new solutions. The growth rate of 14 % per year of international combined transport traffic can be explained as a result of this particular new context.

4.3.5.2. The Hamburg-Billwerder Combined Transport Terminal of " KOMBIVERKEHR "

A visit to the Hamburg-Billwerder Combined Transport Terminal of " KOMBIVERKEHR ", member, as NOVATRANS, of the UIRR was conducted by the Director for the North region, Mr Reinhard Rühr. He explained the activities of the rail-road Company. Created in 1991, this " KOMBIVERKEHR rail-road terminal is one of the biggest in Germany. The traffic capacity of the terminal is 340,000 TEU per year. At present there are about 1000 trucks passing every day through the terminal.

Of particular interest for the participants were the technology issues and the investment required for such type of installations. The terminal is 3 km long and equipped with five electronic mobile cranes (41t). It represents an investment of 6.4 million DM, including the five cranes. In many cases, investment of up to ECU 3 million are enough to create a rail-road terminal in Europe.

4.3.5.3. The Valenton Combined Transport Terminal of the « Compagnie Nouvelle de Conteneurs »

The visit to the CNC Terminal, managed by the CNC (Compagnie Nouvelle de Conteneurs) and the French National Railways Company (SNCF) was conducted by Mr Jean Clapies, General Secretary, and by the Regional Director of CNC, Mr Jean Paul Cordier. The CNC, is, as most of the INTERCONTAINER members, an "integrated operator". They are able to offer « door-to-door » services. With its own means (8000 containers, 5000 wagons, 220 partners), the CNC could cover all the required services at each link of the single multimodal chain: rail traction, provision of containers and the end haulier.

The CNC operates in the "continental market" as well as in the maritime market. In the maritime market, they mainly work on behalf of international forwarders and ship-owners. Annual traffic is 2.3 million tons.

Of particular interest for the participants was the question related to the unitisation of loads[57]. By using pallets, the consolidation into a container of loads from different customers dispatching their goods to the same destination is alleviated. Up to 1948, the railways services were only provided to large customers able to dispatch 10t of freight daily. The CNC was created to allow the SNCF customers to dispatch 2 tons of loads every day instead of waiting 5 days before having access to operators provision.

The pallet is to a container, what a container is to a train or to a vessel. It allows to increase the productivity of the logistic chain by simplifying the handling operations. In Europe, close to 90% of solid freight flows is palletised. On the other hand, Mr Clapies explained the particular problems posed by the "normal container" of 2.32m wide, which is not compatible with the pallets[58] used by the distribution sector. The introduction of ISO "pallets" made obsolete the use of 2.32m wide container: swap bodies can be loaded with 33 pallets while the capacity of the 2.32m wide container is only 24.

[57] Unit load: pallets and prepacked unit to be put into a container to facilitate the loading and unloading operations.
[58] Pallets are of standards dimensions - 1000 mm x 1200 mm (ISO) and 800 mm x 1200 mm (CEN) or " Europallet ".

4.3.6. The Road Facet of Combined Transport

The Study Tour included meetings to two contrasted but complementary road transport companies involved in the combined transport market: The TAB : a medium-sized road company and The CALBERSON-GE: the largest International forwarding company in France

4.3.6.1. The National Road Company: TAB

The "T.A.B" is a medium-sized French transport company, specialised in Rail-Road Transport by swap bodies on the European market. Combined traffic represents 90% of the « T.A.B. total traffic. The company owns 100 trucks and 350 swap bodies. Every day, the company hands 100 swap bodies over to the railways. This represents 90% of the total traffic.

Concrete examples were used to illustrate the company's working methods and organisation. The international activities of such a company are performed thanks to the European network of correspondents. The company passed various mutual agreements with fellow members to ensure the delivery of swap bodies to the final consignees. Such an organisation allows TAB to work in the international market with a reduced fleet truck, only involved in short distance operations. As a result, the company is in good financial health: low driver costs, good quality service (deliveries to final customers are performed without delay); optimised routes etc.

Of particular interest was the discussion on the nature of the commercial relationships between the different partners involved and the type of transport contracts that come within the scope of sales operations:

- the contract between TAB and the customer to be invoiced (the seller or the buyer depending on the commercial sales conditions negotiated by the traders).
- the contract between TAB and its rail-road container-transport supplier (NOVATRANS)
- the contract between NOVATRANS and the Railways (invisible for TAB)
- the conditions under which the delivery and the payment for transport services are performed by the TAB's correspondents.
- the contents of the agreement between TAB and its correspondents

Examples clarified these important aspects of the combined transport business. After visiting the company installations, the delegation was invited to assist to a rail-road terminal, to follow one specific TAB swap-body operation.

4.3.6.2. The International Forwarder " CALBERSON - G.E"

The visit started with a conference performed by Ms Victoria Chkoulanova, a Russian native responsible for marketing development department for the CIS Republics within CALBERSON. After presenting the company. Mrs Chkoulanova described the transformation and present organisation of the European transport market, where large forwarding companies co-exist with small and medium-sized road operators.

This co-existence has been made possible thanks to particular relationships between the operators. Large international operators, such as CALBERSON, are characterised, among other things, by a capability to provide an extended transport and logistic support to the industrial firms working throughout extended geographical areas. The activities covered are from the order preparation to final delivery through storage management, packaging, transportation, customs warehousing, etc. This gives to large operators a strong commercial position: they « have the freight », but only few trucks.

Contrary to large groups, small and medium-sized road companies have a reduced range of services to offer and are often, from the commercial point of view, in a less good position. Furthermore, they often have cash flow problems. By working under contract with large forwarders, small companies do not need to worry

about finding freight traffic or taking on complex transport administrative procedures. They are sure of being paid in time: they « have the truck » but almost no freight.

Small companies compete for sub-contracting agreements with the larger operators. Large operators compete for having freight transport contracts with the final customers.

The Georgian delegation was particularly interested by the documentation issues (commercial, legal and transport contracts). They asked the Team Leader to elaborate a proposal on practical training courses within transport companies and organisations, such as those visited during the study tour. The proposed idea would consist in sending one person from each TRACECA Republic to be trained on the successive links of the combined transport chain for a duration of at least 5 days.

4.4. Evaluation of the Study Tour

On June 27 and 28, 1996, the Consultant organised a special meeting with all the participants to evaluate the effectiveness of the study tour as compared with the initial objectives. To this end a specific questionnaire was used. It contained 10 questions. The result of the evaluation, (the answers of participants are produced in full in Annex 7), can be summarised as follows:

1. Do you think the objectives of the study visit matched with Traceca countries multimodal needs? Why?.

In the opinion of all the participants, the answer to this question is yes.

2. What relevant information and what training needs have you identified?

All the participants said to be satisfied with the information received. However, the Uzbek delegation found that not enough practical documents were distributed. As for the training needs, the participants, especially from Georgia, pointed out the need for a specific practical training within companies such as CALBERSON. The Georgians intend to create a Multimodal forwarding company with the participation of the Georgian Railways. The managers from Calberson replied they have the required experience to perform such training courses. They are at present providing on-the-job training to Russian managers within the frame of the TACIS programme « Productivity Initiative Programme » (transfer of management know-how needed to operate in an open market economy and develop business relations).

3. What permanent links did you create with representatives of West European multi-modal?

Three of the country delegation said they did not have the real possibility of creating such links. The rest of the participants considered they have had the opportunity to create good contacts (specially with INTERCONTAINER and NOVATRANS) and are ready to develop them. For instance, the delegation from Tadjikistan said they concluded a contract with transport group (KOMBIVERKHER) and have invited INTERCONTAINER representatives to visit the country.

4. What do you think about multimodal European systems you have seen? In Germany? In France?

All the participants have a positive opinion of all visited sites and the high professionalism of the people met in Germany as well as in France.

5. Do you think the implementation of a multimodal chain between Traceca and EU countries is feasible? Why? What are the corresponding barriers? How to overcome them?

Almost all the participants said that such a multimodal chain is not only feasible but essential. However, they are aware of the difficulties in overcoming the existing barriers such as the lack of harmonised customs procedures and political problems.

6. What other multimodal sites would you like to visit in the future? Why?

Italy was been named as desirable place to visit in the near future because of the relevance of the multimodal transport in that country. For opposite reasons, Spain and Greece have also been named: the problems of developing combined transport could be closer or similar to their concern. In the opinion of the Georgians and Tadjiks the multimodal sites in the CIS countries or Central Europe are the best suited to TRACECA countries.

7. What did you enjoy the best during this study tour? Why?

Unanimously, what the participants appreciated the most was the organisational aspects related to Multimodal transport system.

8. What did you not enjoy during this study tour? Why?

Some of the participants said they would have liked to have had access to detailed working procedures at the different points of the multimodal chain. The language and interpretation were found sometimes deficient.

9. If such kind of study tour would have to be done again during the next months, what would be necessary to modify (objectives, content, countries, sites, tour organisation, etc.)?

In the opinion of various participants, the content of the study tour could have been more detailed.

10. If the previous questions did not allow you to express your opinion on this study tour, you can do it hereafter:

Apart from the Azerbaidjan delegation, no answers were given to this question. The Azeri delegation prepared and provided the Team Leader with a two-page report on suggestions for the organisation of the multimodal transport within the frame of the TRACECA programme. The question of assisting local governments in the creation or reinforcement of the transport structures at the government level (creation of a Ministry of Transport) was particularly clearly expressed.

Annexes

5. Annexes

Detailed information is presented in various documents attached to the present report.

ANNEX 1: MULTIMODAL TRANSPORT DATA COLLECTION SUPPORT
ANNEX 2: LIST OF RELEVANT CONTACTS MADE DURING THE MISSION
ANNEX 3: CONTAINER MOVEMENT IN RAILWAY TERMINALS
ANNEX 4: SUMMARY OF RAIL ROAD INFRASTRUCTURES
ANNEX 5: RAIL CONTAINER TERMINALS IN TRACECA REGION
ANNEX 6: PROGRAMME OF THE E.U STUDY TOUR AND LIST OF PARTICIPANTS
ANNEX 7: STUDY TOUR EVALUATION RESULTS
ANNEX 8: PROGRAMME OF THE WORKSHOP AND LIST OF PARTICIPANTS
ANNEX 9: UZBEK COTTON MOVEMENT INCEPTION STUDY
ANNEX 10: POTENTIAL FOR MULTIMODAL TRANSPORT
ANNEX 11: CURRENT OPERATIONAL TRAINS SERVICES

ANNEX 1: MULTIMODAL TRANSPORT DATA COLLECTION SUPPORT

MULTIMODAL TRANSPORT SYSTEM ON TRACECA ROUTE

(DATA COLLECTION GUIDE SUPPORT)[1]

[1] The following document is to be used by local experts as a non restrictive or exhaustive guide for the basic data collection. Some adaptations to local circumstances could be necessary.

TABLE OF CONTENTS

1. ROAD TRANSPORT

1.1. Technological aspects (Infrastructure and Vehicle Fleet

Data on the road transport is going to be collected by other various Consultants Teams in charge of others TRACECA projects, namely: « Trade Facilitation, Customs procedures and Freight Forwarding »; « Improvement of Roadside Services, Spare Parts Procurement »; « Road Transport Services in the Caucasus Region »; « Road Transport Services in Central Asia ». And « Implementation of Pavement Management Systems ». Through an internal TACIS-TRACECA co-ordination system, we will recover the general information needed for the « Multi-modal Transport systems ». Nevertheless, some specific data for this study is required:

⇒ Is there any important road section inappropriate for 40" containers traffic because of weight bridges constraints ? _____ Which is the current maximum load per axle permitted? _____
⇒ Which is the cruising speed permitted by the state of the main road: _____
⇒ Which is the estimated road fleet able to operate with :
  * 20" containers (single truck: _____ and single truck + trailer: _____
  * 40" containers (articulated trucks: _____;_____
  * N° of semi-trailers: _____ and chassis: _____
⇒ Is there any problem of compatibility between the road fleet (C.I.S types and ISO containers? ____ If yes, Which kind of problem? _____

1.2. Operational Aspects

1.2.1. Multi-modal systems

- Is there any special road platforms or terminal for road carriers? _____
- Which are the main functions of such platforms?. For instance:

⇒ Parking for heavy trucks ? _____ Container unloading facilities? _____ TIR center? _____ Warehouses? _____ Others? _____

1.2.2. Operating Techniques and organisation.

Data related to the main road companies operating on international multi-modal market?

			International Services provided				
name	Location	N° of Heavy Trucks	Main Internationa Destination	To clear Through Customs	Packagin	Stock Manage ment	Real-time information on operations

- For international container « purely » road traffic, which are the main operating problems on international traffics?. For instance:

⇒ Which is the Average rate of loading? _____ Which is the average back-haul rate (return empty)? _____ Which is the cruising speeds? _____ What 's about the transit times: _____ In which cases, a rail-road container forwarding is preferred to a « purely » road transport: _____ What's about the provision of containers? _____
⇒ Give some examples of current « door-to-door » time from one location in your country to and an specified destination:_____

1.3. Management and Organisational aspects

⇒ How are the cost prices of combined transports elaborated ? « Slumps sums »?:_____ Estimated prices? _____ Other systems? _____ Which one, could you briefly explain it:_____

_____

⇒ Which is the tariff structure of your prices for combined transports: Could you briefly explain the structure of your tariff

⇒ Which are the commercial and administrative documents required for the execution of an international transport by container? _____

_____

_____

_____

⇒ Is there any institution or firm providing assistance on multi-modal transport? _____

_____

What kind of assistance do they provide? (technical assistance, administrative, customs procedures...):

_____

_____

2. RAIL TRANSPORT

2.1. Technological aspects:

2.1.1. Railways Infrastructure and Rolling Stock

Data on the railways infrastructure and rolling stock is going to be collected by other various Consultants Teams in charge of others TRACECA projects, namely: « Infrastructure Maintenance Railways in Central Asia »; « Infrastructure Maintenance Railways in the Caucasus Region » and « Rolling stock Railways Maintenance ». Through an internal TACIS-TRACECA co-ordination system, we will recover the general information needed for the « Multi-modal Transport systems ». Nevertheless, some specific data for this study is required:

- Railways structure gauge constraints related to Multi-modal transports:

⇒ Is rail track gauge the same on all the lines? _____ Which is the current track gauge on typical sections? _____

⇒ Which are the external dimensions permitted for crossing tunnels? _____

⇒ Where are located the sections, eventually posing problems of crossing when carrying container-wagons?

_____

⇒ Is there any important section suffering from weight bridges constraints? _____ Which is the maximum load per axle permitted for 2 axle wagon: _____ and for 3 axles: _____

⇒ Which is the cruising speed permitted by the state of the rail lines: _____

⇒ Which is the availability of wagons able to carry containers? _____. Which types of wagons are used for carrying containers? _____

⇒ Is there any problem of compatibility between wagon and ISO containers? _____ Which kind of problem?_____

2.1.2. Intermodal Transport Units

Type	N° of units	Maker	Owner	Dimensions	Local Production
40" ISO				not applicable	
20" ISO				not applicable	
Special container					
Medium size					
Small container					
Land containers					
Semi-trailers	not applicable				

Concerning packaging techniques, specially the « palletisation », which are the main problems? For instance:
Availability: _____ Are the dimensions innapropiates? _____
Which are the typical dimensions of the most current pallet? _____

2.1.3. Terminal or transfer points

- Main terminal (main terminals and satellite terminals) involved with multi-modal traffic flows?

Terminal name	Location	Surface	Container capacity	N° of travelling gantries	Gantries pulling capacity	N° of lift trucks	Pulling capacity

⇒ Are these means appropriate to transhipment and storage operations? _____

2.2. Operational Aspects

2.2.1. Multi-modal systems

- Which are the existing systems for multi-modal transport purposes?. For instance:

⇒ Wagons systems transporting only the goods containers and requiring vertical handling? _____

⇒ Systems transporting complete vehicles (traction and semi-trailers) on a wagon (vertical or horizontal handling)? _____

⇒ Other systems? _____

2.2.2. Operating Techniques

- Which are the current services programming practices for containers traffics. For instance:

⇒ *Carriage by direct train from point to point* : (train formation between major centres without shunting, running on special programme at high speeds with a reduced number of stops). Give some locations; speeds; frequencies: _____

⇒ *Carriage by individual wagons* (traction of wagons by successive shunting operations from terminals or private siding to the final destination). Give some locations; speeds; frequencies: _____

⇒ *Carriage in a block train*: consolidation of containers from roads carriers or satellite terminals and formation of block trains between two main terminals? Give some locations; speeds; frequencies: _____

⇒ *Others*? Brief description: _____

- Which is the dominant technique? _____
- Which is the main advantages of such technique? _____
  _____
  _____
  _____
- For international container traffic, is there any co-ordinated time schedule? _____
- If yes, are the schedules co-ordinated satisfactorily? _____
- Which are the main operating problems on international traffics?. For instance:

⇒ Which is the Average rate of loading? _____
⇒ Which is the average back-haul rate (return empty)? _____
⇒ Which is the cruising speeds? _____
⇒ What 's about the transit times: _____
⇒ For a twenty foot container, which is the average handling time on main terminal? _____
⇒ Are the delivery operations organised satisfactorily? _____
⇒ Which is the rule concerning the organisation of the container deliveries by road? _____
_____
_____
⇒ Give some examples of current « door-to-door » time from one location in your country to an specified Europe destination: _____
_____
⇒ Which are the documents required for a container transport? _____
At border crossings, are documents and procedures standardised? _____
⇒ In transfer terminals, which is the rule for accompanying transport documents/ customs papers / way-bills?
_____

2.3. Management and Organisational aspects

- Is there any particular firm for the organisation of combined transport. For instance:

  * *Piggy-back companies* (specific companies dedicated to road carriers and providing them rail transport of containers from terminal to terminal). If yes, name: _____ Location: _____

  * *Container shipment companies* : (operator able to provide « door-to-door » services including the provision of containers) If yes, name: _____ Location: _____

- If yes, are these companies a subsidiary of railways or independent?: _____ Which is the structure of such firms (department of tariff? _____ Department for the provision of containers? _____ Department following up of transport operations: _____ After sales department?(transmission of information to customers...):_____
  Others departments?_____

- Following the given example, please fill up the following table:

Services offered	Provided by	Sold to	Cost price per unit
1) Rail traction * From terminal to terminal (terminal location examples)	Railways	-Piggy-back firm. -Container firm? -others?	$/km-wagon $/km-wagon $/container
* From/to private siding (examples)	Railways	??	example: $/unit??
2) Provision of wagons (for container of swap- body (allocation and management)	-Piggy-back firm. -Container firm -others??	-Road carriers? -Others??	examples: $/unit?
3) Handling at transfer points	- Piggy-back firm? - Container firm? - Railways	- Road carriers? - Shipper?	examples: $: unit
	- Ports - Private centres?	-Trans. Operators - Forwarders? - Road carriers?	examples: $/unit
4) Provision of Containers	- Road carriers? - Piggy-back firm? - Container firm? - Railways? - Maritime firms?	- Shipper?	examples: $/unit
5) Initial and Terminal haul road services	- Road carrier? - Container firm? - Shipper?	- Shipper	examples: $/unit

- Combined transport tariff system:.

⇒ How are the cost prices of combined transports elaborated ? « Slumps sums »?: _____ « Estimated prices »?: _____ Other system? _____ Which one, could you briefly explain it:

_____

_____

⇒ Which is the tariff structure for combined transports: « link by link prices »? _____ « average prices »? _____ Other? _____ Could you briefly explain the structure of the current tariffs?

_____

⇒ How are the revenues collected between various national railway _____

_____

⇒ Which are the methods in use for pricing services and make each company paid: _____

_____

⇒ What's about transit prices? How do proceed in this cases? _____ _____

_____

_____

- ***Marketing Aspects***
- Marketing operations and relations at national level:

⇒ Is there any specific organisational link between the main actors of the multi-modal transport system (authorities, railways, operators..); _____ Could you describe the agreement between the railways companies, the operators and public authorities to improve multi-modal transport efficiency? _____

⇒ Which kind of co-operation does exist now? For instance:

* *Technical side*: solution of key terminals choice ?_____ rationalisation of handling facilities? _____ increases in frequencies? _____ Concentration of traffic flows on corridors carrying heavy flows traffic? _____ _____ creation of a container pool? _____
* *Commercial side*: improving the co-ordination of schedules? _____ appropriate organisation at both ends of the routes? _____ making the fares system more flexible? _____ transport quality (time, frequency; pick up and delivery times): _____

- Which are the means adopted to realise this objectives?

  * Is there any co-operation agreements signed or in progress between road and rail sector to work together on a basis of mutual benefits and setting common goals: _____
  * provision of skills and training? _____
  * gathering intermodal data and information? _____
  * Is there any defined infrastructure planned efforts: _____
  * If yes, which is the geographical field concerned? _____ Is there any investments opportunity already contemplated? _____

- Marketing relations and co-operation at international level:

⇒ Is there any agreement between the main actors of the multi-modal transport system at international level (TRACECA countries authorities, railways, operators, accession to the international convention on containers...): _____

Which are the aims of the actors to improve multi-modal transport efficiency: _____

- How this co-operation have been translated their aims into specific measures?
  * *Technical side*: choice of key terminals? _____ harmonisation of technical standards and administrative procedures: _____ rationalisation of handling facilities? _____ increases in frequencies? _____ Concentration of traffic flows on corridors carrying heavy flows traffic? _____ _____ creation of a container pool? _____
  * *Commercial side*: improving the co-ordination of schedules? _____ appropriate organisation at both ends of the routes? _____ making the fares system more flexible? _____ transport quality (time, frequency; pick up and delivery times): _____ use of documentary credit terms compatible with multi-modal transports: _____

- Which are the means adopted to realise this objectives?

  * Is there any co-operation agreements signed or in progress between road and rail international companies related to multi-modal transport: _____
  * Implementation of INCOTERMS best suited to support multi-modal transports: _____
  * provision of skills and training? _____
  * gathering intermodal data and information? _____
  * Is there any defined infrastructure planned efforts: _____
  * If yes, which is the geographical field concerned? _____
  * Is there any investments opportunity already contemplated? _____

  Others? _____

2.5. Combined traffic Flows

- « Containerised » traffic for the following types of goods (in tons or 20'' equivalent for 1995/ source of information to be precise)

Types of Goods	Maritime(1)	Continental		Transit
		Domestic	Regional(2)	
Agricultural products and livestock				
Textile				
Foodstuff				
Refined oil products				
Minerals				
Metallurgy				
Building materials				
Chemicals products				
Mechanical engineering				
Others				

(1) Maritime market: land transport of containers going out or coming in from maritime ports.
(2) International traffic with neighbouring countries from road platforms or rail Terminals

- Which are the main origin-destination for the most important products? _____
- Are this traffic balanced? (difference between cargo going out and coming in on the same considered axis)? _____
- Freight « containerised » traffic Trends: Which are rate of growth of the multi-modal traffic, globally and for specific products? _____

In your opinion, which are the prospects for combined transport in the short term/middle term?

_____

_____

_____

3. MARITIME TRANSPORT

Data on the maritime transport is going to be collected by other various Consultants Teams in charge of others TRACECA projects, namely: « Port Network Plan and Improvement Programme »; « Improvement of Human Resources »; « Bake and ABTA Port ferry terminals », but also through already completed projects, namely: « Rising level Caspian Sea ». Through a specific TACIS-TRACECA co-ordination system, we will recover the general information needed for the « Multi-modal Transport systems ». Nevertheless, some specific data for this study is required:

⇒ Which is the number of 20 foot container handled by year? _____
⇒ Is there any specific area for consolidation of containers? _____ Which is the area available for such function? _____ Are this traffic flows coming from roads or rail transports?_____
⇒ Which is the dominant mode of transport from and to Ports? _____
⇒ How many containers are handled per month? _____
⇒ Which is the number of 20 foot container equivalent handled by month: _____
⇒ In average, how long is a container staying at the port? _____
⇒ Which are the average cost prices for a 20" handling operation ?_____
⇒ How are the freight prices calculated ? For instance. Using a standard list of items and then applying it a factor per unit (ton, cubic meters, « slump sum » by container, ...etc.)

4. INLAND NAVIGATION

- Could you briefly describe the inland navigation infrastructure: length; location of key terminals, etc:_____

  _____

  _____

  _____

  _____

  _____

  Which are the main fleet characteristics? type of vessels? _____ number of units:

  _____

  _____

- Which are the main transhipment techniques: _____

_____

_____

_____

ANNEX 2: LIST OF RELEVANT CONTACTS MADE DURING THE MISSION

Country	G	Person	Organisation	Position
ARMENIA	Mr	SUMBATYAN Sergey	ARMEN-TRANSFORWARDER	Deputy Chairman
ARMENIA	Mr	AKOPIAN Levon	Armenian Railways	First Deputy Manager
ARMENIA	Mr	AMBARTSOUMIAN G.	Ministry of Transport and Communication	Head of the Foreign Relations Department
ARMENIA	Mr	SHAHNAZARYAN. Ashot	Ministry of Transport and Communication	First Vice Minister of Transport
ARMENIA	Mr	SUMBATYAN. M.	Armen-transforwarder	Chairman
ARMENIA	Mr	BALYAN Souren	ARMEN-TRANSFORWARDER	President
ARMENIA	Mr	YESSAYAN. A.	World Food Programme	Head of Logistic Department
AZERBAIDJAN	Mr	GASSUMOV. C.	GTC Global Transport	Local Director (German Company)
AZERBAIDJAN	Mr	AIVOZOV	Ministry of Economy	Deputy Head of the Transport Department
AZERBAIDJAN	Mr	NADIRLY. V.	Azerbaidjan Railways	Director of Railways
AZERBAIDJAN	Mr	MAMEDOV. A.	BAKU International Trade Port	Director of the Trade Activities of the Port
AZERBAIDJAN	Mr	TEIMUROV. T.	Caspian Shipping Co (Baku)	Deputy Manager
AZERBAIDJAN	Mr	MAMEDOV	"Azerail" Stock Company	Head Export-Import Department
AZERBAIDJAN	Mr	AZKEROV	"Azerail" Stock Company	Deputy General Director
AZERBAIDJAN	Mr	IZMAILOV	Azerbaidjan Railways	Deputy Head of the Freight Department
AZERBAIDJAN	Mr	SADIKHOV. Icram	Ministry of Economy	Head of the Transport Department
AZERBAIDJAN	Mr	DSHAFAROV. N.	Azintrans (International Road Company)	Adviser of the President
AZERBAIDJAN	Mr	NAMEDOV	Port of Baku	Deputy Manager of the Port
AZERBAIDJAN	Mr	SAMEDOV	Azerbaidjan Railways	Head of Freight Department
AZERBAIDJAN	Mr	PONOMARTCHUK	Azerbaidjan Railways	Head of the Technical Department
AZERBAIDJAN	Mr	KIAZIMOV. Sultan	Port of Baku	Deputy Manager
BELGIUM	Mr	TEILLET Bernard	European Intermodal Association	General Secretaire
BELGIUM	Mrs	KUSCHEL Susanne	International Combined Transport Union, UIRR.	Marketing and European Affairs
FRANCE	Mr	ETIENNE Jean	French Minitsry of Transport	Head of Public Works Department
FRANCE	Mr	CORDIER. J.P	Compagnie Novelle de Conteneur. CNC	Regional Director
FRANCE	Mrs	CHKOULANOVA. V.	Calberson G.E.	Chief for CIS Transport Operations
FRANCE	Mr	RIVET Christian	French Railways - SNCF	Head of Combined Transport Division
FRANCE	Mr	ROSSI. Jacques	French National Union for Combined Transport	General Secretaire
FRANCE	Mr	KIEFFEAR	SNCF-Metz	Manager of the Metz "node" Station
FRANCE	Mr	CLAPIES. J.	Compagnie Novelle de Conteneur. CNC	General Secretaire
FRANCE	Mr	JORAJURIA.R.	Novatrans	Head of Valenton Terminal
FRANCE	Mr	MOUSNIER-LOMPRE	Ministère des Transports et de l'Equipment	Head of Foreign Relations Division
FRANCE	Mr	AROCAS. Claude	Novatrans	Regional Director
GEORGIA	Mr	DOLBAYA	National Transport Council	Deputy Director
GEORGIA	Mr	MITAISHVILI. R.	Ministry of Economy	Deputy Minister/ Head of Transport Department
GEORGIA	Mr	TSOMAIA. George.	CAUTREX (Cau-trans-Forwarder)	Head of the Company

Country	G	Person	Organisation	Position
GEORGIA	Mr	CHUBINISHVILI. T.	Georgian Institut for Scientific and Tech Informt.	Deputy Manager
GEORGIA	Mr	JOBAVA. M.	BCC GEORGIA	Local Business Developper
GEORGIA	Mr	TODUA	Georgian Railways	Deputy Head Traffic Department
GEORGIA	Mr	VASHAKIDZE. R.	Georgian Railways	President of the Georgian Railways
GEORGIA	Mr	KUKUJIDZE Jemal	Port of Batumi	Port Director
GEORGIA	Mr	NAKAIDZE Guram	Centre for TRACECA problems	Chairman of the Centre
GEORGIA	Mr	CHKHEIDZE. Alexander	International Road Carriers Associatiation	President of the Association
GEORGIA	Mr	KERVALISHVILI. T.	Gruzzheldorepspeditsiya (Freight Forwarder)	Deputy Head
GEORGIA	Mr	ZIBZIDADZE Alex	Georgian Railways	Chief Engineer
GEORGIA	Mr	GORSHKOV Teimuraz	National Transport Council	Head of Transport Studies Department
GEORGIA	Mr	AKAKI. Chaidze	National Transport Council	Chairman of the Council
GEORGIA	Mr	TKEBUTCHAVA. V.	International Road Carriers Associatiation	Head of the Association
GEORGIA	Mr	LOMADZE	National Transport Council	Vice Chairmain of the Council
GEORGIA	Mr	GELIADZE. V.	Port of Poti	Head of the Port
GERMANY	Mr	SCHULZE-FREYBERG. W.	Polen-Hamburg Transport Gmbh	Deputy Manager
GERMANY	Mr	RUHR Reinhard	Kombiverkerhr (Combined Transport Company)	Manager
GERMANY	Mr	BOLLER. R.	Hamburger Hafen-und Lagerhaus	Executive Manager
GERMANY	Mr	FURNELL. W.	Hamburger Hafen-und Lagerhaus	Head of the Marketing / Container Division
KAZAKHSTAN	Mr	URAZBEKOV	Ministry of Transport and Communication	Head of Railways Transport Division
KAZAKHSTAN	Mr	FLUGGE Mario	M&M Kazakhstan	Managing Director
KAZAKHSTAN	Mr	ATIMANOV. S.	International Transport Services	Deputy Manager
KAZAKHSTAN	Mr	KAPLAN. Eduard	Research Inst. of Road Transport (NIIAT)	Deputy Director
KAZAKHSTAN	Mr	UTEKBEKOV. Vladimir	ISKOMTRANS	General Director
KAZAKHSTAN	Mrs	SAGIMBAYEVA. S.	ISKOMTRANS	Chief Manager
KAZAKHSTAN	Mr	TARANENKO. Arkadi	Ministry of Transport and Communication	Head of the Transport Department for Science and Techni
KAZAKHSTAN	Mr	MUKHAMEDJANOV Kanat	Ministry of Transport and Communication	Deputy Minister
KAZAKHSTAN	Mrs	SABETOVA. R.	KAZINTERFREIGHT, Forwarder	Deputy General Director
KAZAKHSTAN	Mr	PARFYONOV D.	BUTYA (Private trader company)	Deputy General Director
KAZAKHSTAN	Mr	SEGAL Ilya	Railways Department	Manager Department
KAZAKHSTAN	Mr	IRGIBAYEV. S.A.	International Road Carriers Associatiation	Head of the Association
KAZAKHSTAN	Mr	ALIGHUZINOV Serik	Ministry of Transport and Communication	First Vice Minister of Transport
KAZAKHSTAN	Mr	MUKHAMEDJANOV. N.	Ministry of Transport and Communication	Deputy Minister
KAZAKHSTAN	Mr	TEMIRBAYEV	Ministry of Transport and Communication	First Deputy of Railways Transport Department
KAZAKHSTAN	Mr	ZAVIALOV Anatoly	Kazavtotrans Road Company	General Director
KAZAKHSTAN	Mr	KOKREVJBAYEV	State Company Almatyzheldorexpediciya	General Director
KAZAKHSTAN	Mr	SDERZHIKOV. V.	Maritime and Inland Waterways	Maritime Transport Economist

Country	G	Person	Organisation	Position
KAZAKHSTAN	Mr	ATYMANOV	Almaty Railways	Head of the International Transport Department
KYRGYZSTAN	Mr	AL TREGASHVILI. L.	State Instituteof Road Design	Director of the Institute
KYRGYZSTAN	Mr	IRSALIEV. Almazbek	Ministry of Transport and Communication	Head of Economic and Foreign Relations
KYRGYZSTAN	Mr	MATYUSENKO.	State Institute of Road Design	Road Engineer
KYRGYZSTAN	Mr	SATYBALDIEV. Jeantoro	Ministry of Transport and Communication	First Vice-Minister
KYRGYZSTAN	Mr	ALIBEGASHVILI. L.	State Institute of Road Design	Director of the Institute
KYRGYZSTAN	Mr	ALEXEYEV	Kyrgyzheldorexpediciya	Deputy Manager
KYRGYZSTAN	Mr	ISMANKULOV. K.	Militzer & Munch Forwarder	Local Manager
KYRGYZSTAN	Mr	RACHMATULIN. R.	Ministry of Transport and Communication	Head of Roads Division
KYRGYZSTAN	Mr	SMATOV Nurdin	Ministry of Transport and Communication	Head of the Automobile Division
KYRGYZSTAN	Mr	KOULIEV Takhar	"DOSTUK" Transport Company	General Director
KYRGYZSTAN	Mr	ZAKIROV Adam	Ministry of Transport and Communication	First Deputy Minister of Transport
KYRGYZSTAN	Mr	ZAKIROV Zuleyman	Government of Kyrgyzstan	Head for the Department of Transport and Communication
KYRGYZSTAN	Mr	TALASBAYEV	Kyrgyz Railways	Chief Engineer
KYRGYZSTAN	Mr	TAKYRBASHESHEV	Kyrgyz Railways	First Deputy of the General Director
KYRGYZSTAN	Mr	ZAKIROV Adam.	Ministry of Transport and Communication	Deputy Minister
SWITZERLAND	Mr	BURNASHEV. A.	INTERCONTAINER	Route Manager
SWITZERLAND	Mr	SCHMELTER Pierre	INTERCONTAINER-Bale	Directeur for Central Europe
TADJIKISTAN	Mr	BOLTOV. Victor	Ministry of Economy	Vice Minister of Economy
TADJIKISTAN	Mr	MIRZOEV. Timur	State Design Research Institute	Director
TADJIKISTAN	Mr	CHODIEV Bakhrom	Tadjik Railways	Chief Engineer
TURKMENISTAN	Mr	YAZBERDIEV. M.	Ministry of Transport and Communication	Head of the Transport Department within the Cabinet of
TURKMENISTAN	Mr	KHALYKOV. H.	Turkmenistan Railways	Head of the Turkmenian Railways
TURKMENISTAN	Mr	SEIDOV	Turkmenian Railways	Head of the Station Obesberdyev-Kuliyevo
TURKMENISTAN	Mr	DURAIEV	Port of Turkmenbaschi	Head of the Port
TURKMENISTAN	Mr	ALLAKULIEV. Oraz.	"Turmenvneshtrans" (Internat. Road Company)	General Manager
TURKMENISTAN	Mr	TOURAYEV. Rasheed	Ministry of Automobile Transport	Deputy Minister
TURKMENISTAN	Mr	KAZANOV	Turkmenian Railways	Deputy Head of the Railway District Chardzhev
TURKMENISTAN	Mr	IVANOV	Turkmenian Railways	Deputy Head. Fowarding Department
TURKMENISTAN	Mr	BAKHALOV	Turkmenian Railways	Head of teh Department for Operation and Commercial Pe
TURKMENISTAN	Mrs	BIASHIMOVA	Turkmenian Railways	Heas of the Department for International Economic Relatio
TURKMENISTAN	Mr	ALTINAZAROV. A.	Customs Authorities	Chief of Statistical Department
TURKMENISTAN	Mr	VERHEIJEN Peter	M&M Turkmenistan	Local Manager
TURKMENISTAN	Mr	RECHOV A.	BOUYGUES-Turkmenistan	Local Director
TURKMENISTAN	Mr	ELANTSEV. V.	Ministry of Transport and Communication	Adviser
TURKMENISTAN	Mr	DURDIEV. H.	Turkmen Sea Transports Department	Chairman

Country	G	Person	Organisation	Position
TURKMENISTAN	Mr	ALLAKULLIEV. O.	"Turkmenvneshtrans"	General Manager
TURKMENISTAN	Mr	DJEPAROV. Siedar	Ministry of Automobile Transport	Chief of Economic and Foreign Relations
TURKMENISTAN	Mr	MAMEDOV Mered	State Railways of Turkmenistan	Deputy Manager
UZBEKISTAN	Mr	SERGELI	Autochservis	Operational Manager
UZBEKISTAN	Mr	HO-KYON SHIN	WOO JIN (DAEWOO's container supplier)	Director
UZBEKISTAN	Mr	CHADMANOV. A.	Shosh-Trans	General Director
UZBEKISTAN	Mr	GANIEV. E.	Ministry of International Trade	First Vice-Minister
UZBEKISTAN	Mr	ZUFAROV. S.	Autochservis	President
UZBEKISTAN	Mr	KURBANOV. B.	SEA LAND	Sales Manager for Central Asia
UZBEKISTAN	Mr	GUBAREV	Uzbek Ralways	Head of the Wagon Service Department
UZBEKISTAN	Mr	DYATCHKOV. V.	OUZKHLOKOPROMSBYT (Cotton distribution)	Vice-President
UZBEKISTAN	Mr	KODYROV. S.	Tashkent Inststitute of road Engineers	Director
UZBEKISTAN	Mr	KAN. K.	GIPROTRANS (Design Research TransP Inst.	Director
UZBEKISTAN	Mr	NURITDINOVICH. G.	UZAVTOTRANS	Deputy Manager
UZBEKISTAN	Mr	PHAROUKH. A.	OUZKHLOKOPROMSBYT (Cotton distribution	Director for International Logistics
UZBEKISTAN	Mr	ISMAILOV. V.	UZAVTOTRANS State Joint Stock	Deputy of the Board Chairman
UZBEKISTAN	Mr	DAVIDOVITCH	Uzbek Railways	Head of Department of International Relations
UZBEKISTAN	Mr	BAKHOLDIN	Uzbek Ralways	Head of Operational Department
UZBEKISTAN	Mr	BABADZHNOVA	Uzbek Ralways	Head of the Computer-based Management Systems
UZBEKISTAN	Mr	IBRAGIMKHODAJAEV. S.	UZAVSTOTEKNICA	Deputy Manager
UZBEKISTAN	Mr	KHALISSOV. Murat	Shosh-Trans (Forwarder Uzbek)	Deputy Manager
UZBEKISTAN	Mr	ERKINOV. Navruz	Uzkek Railaways	Head of Economic and Foreign Relations
UZBEKISTAN	Mr	KASYMOV. B.	Road Carriers Association and "Uzintrans"	General Manager
UZBEKISTAN	Mr	DUBINCHIK. George	Shosh-Trans (Forwarder)	Deputy Director
UZBEKISTAN	Mr	ONKIS. V.	Ministry of Foreign Trade	Head of the Railways Department
UZBEKISTAN	Mr	ALIEV Mansur	UZAVTOTRANS State Joint Stock	Deputy of the Board Chariman
UZBEKISTAN	Mr	NADJIMITDINOV. K.	UZAVTOTRANS State Joint Stock	Chief adviser for foreign econmic activities
UZBEKISTAN	Mr	GUBATCHEV	Uzbek Ralways	Deputy Head of Department of International Relations
UZBEZKIZTAN	Mr	KASYMOV. B.	International Road Carriers Associatiation	Head of the Association

ANNEX 3: CONTAINER MOVEMENT IN RAILWAY TERMINALS

Container Movement in Railway Terminals -

Year 1995

COUNTRY	TERMINAL	LOADED			UNLOADED		
		Large size (ISO 20-40")	Medium size	Total	Large size (ISO 20-40")	Medium size	Total
ARMENIA							
	Karmir/Blur	158	0	158	426	6	432
	Total (country)						
AZERBAIJAN							
	* Baku	0	400	400	0	166	166
	Total (country)						
GEORGIA							
	* Poti						
	* Batumi tov.		5	5			
	* Kutaisi 2		3	3			
	* Zestafoni						
	* Samtredia 1						
	* Tbilisi tov.	74	725	799	50	20	70
	Telavi						
	* Khashuri		4	4	8		
	* Kaspi						
	* Gori gruz.		2	2			
	* Rustavi gruz.		18	18			
	Total (country)	74	757	831	58	20	78
KAZAKHSTAN							
Almatinskaya Railways							
	* Arys	4	295	299	5	33	38
	Turkestan	10	776	786	157	974	1 131
	* Chimkent	737	3 586	4 323	22	48	70
	Kurgasyn						
	* Tulkubas						
	* Tatty		47	47			
	* Lugovaya		330	330		10	10
	* Kuragaty		9	9			
	* Shu	2	578	580			
	Sary-Shagan		796	796	26	413	439
	* Zhambyl	558	2 485	3 043	34	899	933
	Karatau	1	583	584		94	94
	Zhanatas	20	93	113		10	10
	Chaldala					168	168
	* Almaty I	1	19	20			
	* Almaty II	2 206	12 414	14 620	864	4 186	5 050
	* Sary-Ozek	9	420	429			
	Taldy-Kurgan	543	2 967	3 510		10	10
	* Ush-Tobe		459	459		75	75
	Tekeli	15	14	29			
	* Druzhba						
	Ayaguz	3	466	469			
	Semipalatinsk	253	2 745	2 998		10	10
	Konechnaya	1	34	35			
	Korshunovo	1	34	35	8	11	19
	Neverovskaya		90	90	4	249	253
	Shemonaikha	1	240	241			
	Zaschita	231	3 095	3 326	224	1 983	2 207
	Leninogorsk		394	394		110	110
	Serebryanka		380	380		22	22
	Zyryanovsk	1	739	740		12	12
	Ustkamenogorsk						
	Otar		10	10			
	Sub-Total	4 597	34 098	38 695	1 344	9 317	10 661

Tselinaya Railways		railway				
Amankaragai		242	242			
Dzhetygara	692	319	1 011	18	54	72
Zhelezorudnaya						
Kushmurun				2		2
Komsomolets		75	75			
Kustanai	189	1 799	1 988		1 219	1 219
Mailina		254	254	14	96	110
Agadyr		123	123		7	7
Balkhash	11	1 156	1 167	10	139	149
Dzhezkazgan	132	1 044	1 176	179	63	242
Zhana-Arka	1	131	132	18	58	76
Novo-Dubovsk				6		6
Zhana-Aul				6		6
Karaganda-Pas.	297	4 014	4 311	495	863	1 358
Karaganda-Ugoln.						
Karaganda-Nov.						
Karazhal		230	230		87	87
Osakarovka		177	177		9	9
Temir-Tau	9	1 024	1 033	4	113	117
B.Metalurgicheskaya						
Murza						
Nurinskaya						
Ar-Kul		93	93		25	25
Volodarskoe		228	228			
Kokchetau	170	1 461	1 631	759	558	1 317
Borovoe		637	637		600	600
Makinka		233	233		10	10
Novo-Ishimskaya	1	110	111			
Suly	1	116	117			
Taincha		200	200		39	39
Aksu	767	1 230	1 997	14		14
Arkalyk	45	909	954	64	11	75
Atbasar		402	402	5	22	27
Derzhavinskaya	5	615	620	4	219	223
Dzhaksy		112	112			
Ermentau		202	202		11	11
Esil	1	466	467	19	7	26
Tselinograd	169	2 366	2 535	390	554	944
Shortandy						
Boschakul						
Ermak	1	407	408		212	212
Ermak-Gruzovoi	106	19	125	28	38	66
Pavlodar		4	4	5		5
Pavlodar-Port				30		30
Pavlodar-Severnyi						
Pavlodar-Yuzhnyi	231	2 267	2 498	387	53	440
Ushkulyn						
Scherbakty	1	30	31		66	66
Ekibastuz	30	1 423	1 453	164	11	175
Kzyl-Tu		45	45			
Sorokovaya						
Maikuduk		8	8			
Post 120						
B.Mikhailovka						
Karagaily						
Smirnovo				27		27
B.P.7					12	12
Chaglinka					7	7
Sub-Total	2 859	24 171	27 030	2 648	5 163	7 811
Zapadno-Kazakhstanskaya Railways						
Kzyl-Orda	74	1 385	1 459			
Tura-Tam	110	2 078	2 188			
Aktubinsk	1 644	3 101	4 745			
Zhilaevo	365	2 200	2 565			
Atyrau	256	1 724	1 980			
Mangyshlak	474	3 202	3 676			
Sub-Total	2 923	13 690	16 613	NA	NA	NA
Total (country)	10 379	71 959	82 338	NA	NA	NA

			railway				
KYRGYZSTAN							
	Bishkek - I		4 963	4 963	833		833
	Rybachye		584	584	108		108
	Karabalta	25	590	615	5		5
	Alamedin	860		860	506	506	1 012
	Dzhalal-Abad	99	599	698	125		125
	Osh	292	991	1 283	1 005	335	1 340
	Kyzyl-Kiya	24	168	192	1	1	2
	Total (country)	1 300	7 895	9 195	2 583	842	3 425
TADJIKISTAN							
	Dushanbe-2	7 400	11 638	19 038	403	695	1 098
	Kurgan-Tube	10	374	384		236	236
	Khudzhant	947	3 944	4 891	4	9	13
	Kanibadam	64	551	615			0
	Total (country)	8 421	16 507	24 928	407	940	1 347
TURKMENISTAN							
	* Krasnovodsk		1 439	1 439			
	* Nebit-Dag		763	763			
	* Gyzylarbat		365	365			
	* Ovezberdy-Kulievo	548	3 714	4 262			
	* Kaahka		365	365			
	* Tedzhen		365	365			
	Maiskaya	365	880	1 245			
	* Bairam-Ali		365	365			
	Gushgy		365	365			
	* Chardzhou-2		1 524	1 524			
	Gazodzhak		365	365			
	Zerger	541		541			
	Seidi		365	365			
	Dashkhouz	335	365	700			
	Amudarya		365	365			
	Total (country)	1 789	11 605	13 394	NA	NA	NA
UZBEKISTAN							
	Total (country)	6 983	31 640	38 623	NA	NA	NA

* means: terminal located on main TRACECA CORRIDOR

NOTE: Statistics for unloaded containers are generally either incomplete or non-existing

ANNEX 4: SUMMARY OF RAIL ROAD INFRASTRUCTURES

SUMMARY OF RAIL AND ROADS INFRASTRUCTURES

From Kazakhstan to Georgia, the transport network involved by the TRACECA corridor is summarised as follows:

Kazakshtan

Kazakhstan railways system comprise around 12,600 kilometres. It is operated by three regional networks: the Almaty network serving around 4,000 kilometres around Almaty, the Tselinaya north-eastern network serving around 4,900 kilometres and the country and the western and north-western network serving around 3,700 kilometres. From Almaty rail lines goes in three main directions: to Russian Federation borders in the north; to Uzbekistan border and to the shores of the Caspian sea. The main links involved by the TRACECA corridor, the line which connect Almaty to the Port of Aktau and the to Tchengeldy in the direction to Tashkent, are summarised as follows:

- **Almaty - Aktau:** This line connect Almaty with the port of Aktau, through Kandagach (2,192 km from Almaty); over a distance of 3,289 kilometres. The route is single track over the 311 kilometres from Almaty to Shu, double track over the 1,881 kilometres from Shu to Kandagach and from there single track again over the 1,097 kilometres to Aktau. The line is electrified from Almaty to Shu and over the 2,429-km section from Arys to Aktau..
- **Almaty - Tchengeldy:** This line links Almaty and Tchengeldy at the border with Uzbekistan. The lines goes through the Uzbekistan and Turkmenistan and would serve cargo from Kazakhstan to port of Turkmenbashi on the Caspian sea. The route, long of 930 kilometres, goes around the border between Kazakhstan and Uzbekistan through Shu, Jambyl, Shimkent and Arys.The entire route is electrified.

As for the road network, it comprises 87,800 kilometres of public roads divided in national roads (around 17,400 km) and local roads (around 70,400 km). Nearly the entire road network is made up of at least two lanes. In general, roads are in a relatively good state. This partly explain that long distances road operations are developing.

Kyrgyzstan

Kyrgyzstan occupies the Tien Shan mountain range which stretches for hundreds of kilometres across the north-eastern part of Central Asia. Over 94 % of the country has altitudes of more than 1000 meters above sea level, and about 40 % is more than 3000 meters. (average elevation is 2,750 meters). The country commands a well developed network, adjusted to geographical characteristics. The roads constitute the basis of the network; Over 50 % of the 20.000 km of roads are paved and in sufficiently good condition. However, one of the main roads connecting Bishkek to Osh, the two major industrial centres, are degenerating. Automotive transport , with about 72% of the freight traffic, is by far the most important transport mode of Kyrgystan.

As for rail network, it consists of small line 340 km long, which goes through the Chu Valley (the most developed industrial region of the country) in the north and links up with a Kazakhstanian railways network. The line is one of the Kyrgyzstan possibilities to integrate a multimodal YTRACECA corridor. An small line in the south, connects the country to with Uzbekistan. It travels from Kok-langak (50 km north of Osh) to Andijan (Uzbekistan) and Bekabad (Tadjikistan). From there, railways shipment to Tashkent in the North or Samarkand in the south rail links exits.

Uzbekistan

Reflecting the distribution of the main economical and industrial centres, the infrastructure is well developed in the south and south-eastern parts of the country and much less in the central and western parts, (mainly made up of deserts). During Soviet times, Tashkent was the headquarters of the Central Asian network covering all railway lines in four of the five Central Asian republics (with the exception of Kazakhstan). At present, the rail network of around 3,380 kilometres (with a track gauge of 1,520 mm) comprises three main links:

1. **Tashkent - Tchengeldy** in Kazakhtan: 79 km, the route connects Eastwards with Almaty and westward with the section Tashkent-Khochadavlet. The line is double track and entirely electrified.

2. **Tashkent - Khodchadavlet** (at the border between Uzbekistan and Turkmenistan: 685 km, it goes through the cities of Dzhizak (203 km), Samarkand (131 km), Navoi (138 km) and Bukhara (93 km) and Khodchadavlet 120 km further west. The line is partly double tracked between Bukhara and Khodchadavlet (over around 60 km) and completely double track between Dzhizak and Samarkand (131 km). It is mostly single tracked between Tashkent and Dzhizak, and completely single tracked between Samarkand and Bukhara. Then, the line continues to the port of Turmenbaschy on the Caspian sea. The entire link is diesel operated.

3. **Tashkent - Karakalpakia** (at the border between Uzbekistan and Kazakhstan): 1,850 kilometres. it travels to Chardjev (around 20 km), Gasodjak (322 km), Shabat (112 km), Takhyatach (72 km), Kungrad (101 km). The line straddles the border between Uzbekistan and Turmenistan. The two countries are experiencing some difficulties in defining inter-operability regulations. This situation is such that the Uzbeks are now planning the construction of a 342-km new line, single track and non-electrified, which would link Uchkuduk with Nukusss and by-pass Turkmenistan. The Uzbeks railways are also planning the reconstruction of the existing Navoi and Uchkuduk (290 km) line.

As for the road network of Uzbekistan, it comprises around 43,250 kilometres divided in international roads (around 3,250 km), state roads (around 18,600 km) and local roads (around 21,400 km). The are two main links: a north-east↔south-west link connecting Tashkent to Karakul in Turkmenistan, (through Bukhara, Navoi and Samarkand), and a south-west↔north-west link between Termez and Nukuss via Bukhara. 42% of the road from Tashkent to Karakul (677 kilometres) is estimated to be in a state of good repair while 58% are deemed in fair conditions.

Tadjikistan

Tadjikistan (143 000km²) is one of the most land-locked countries of Central Asia . The north of the country is almost separated from the rest of the territory by the Alai mountains located in Kyrgyzstan. The existing rail lines in the north, travels between western and eastern Tadjikistan from Kanibadam (at the border with Kyrgyzstan) Sovetabad (near Khodjent) and Bekabad. From there, two existing branches connects the system with Samarkand and Tashkent (Uzbekistan). In parallel to the rail line, there is a road connection between western and eastern which is in poor condition.

The south-western Tadjikistan is depending on the rail corridor from Termez, in Uzbekistan. Commodities are forwarded from Termez, to Jougan-Tube where two branches connects Dushanbe and Kouliab respectively.

Turkmenistan

The transport infrastructure, not so extensively developed as in other republics, reflects the distribution of population, rather sparse, (4.3 million inhabitants with 500,000 in Ashgabat) this large country (480,000 sq.-km) is mainly made up of deserts (around 90% of the territory). Its geographical position makes the country a typical transit country and the development of transport infrastructure could provide currency revenues in transit rights.

The railways of Turkmenistan comprise around 2,200 kilometres. Its entirely operated with diesel traction and out of 40 kilometres of double tracks around Ashgabat, the network is single tracked. The main line connects Ashgabat with Tashkent and with the port of Turkmenbashy (over a distance of 557 kilometres). From Turkmenbaschi, a ferry link travels across the Caspian sea to Baku (Azerbaidjan). The line section connecting Ashgabat to Tashkent goes through Mari (343 km) and Chardjev (243 km). From Chardjev the line continues to Gasodjak (319 km) and then enters in Uzbekistan (for 112 kilometres) before entering again in Turkmenistan (for 71 kilometres).

As for the road network of Turkmenistan, it comprises around 13,600 kilometres of public roads divided in state roads (1,700 km), republic roads (around 4,800 km) and local roads (around 7,100 km). Around 81% of

the road network is made up of road of category IV and V with only around 7% of road of category I and II. The road from Turkmenbaschi to Chardjiev is in good condition.

Azerbaidjan

The Azerbaidjan railway system comprises 1,700 kilometres distributed in a north-western and western direction. The main line linking Baku to Tbilissi, is of particular interest for freight movements between Central Asia and Europe. The line starts at the Caspian sea port of Baku where traffic coming from other Caspian sea ports via ferry services, mainly Turmenbaschy (Turkmenistan) is picked up. To a lesser extent, Aktau (Kazakhstan) also provides traffic Baku. From Baku, the rail line goes to Beyuk Kyacik (the border between Azerbaidjan and Georgia) over a distance of 484 km through Alyat (69 km), Eblach (210 km) and Akstafa (162 km). It continues to Tbilissi and further on to the Black sea ports of Poti and Batumi. The entire link is double track and electrified.

As for the road network, there is connection between Baku and Georgia. From Black sea ports to Baku, according to cost studies made by the logistics Advisory Unit from the World Food Programme, shipments by rail is the most effective option.

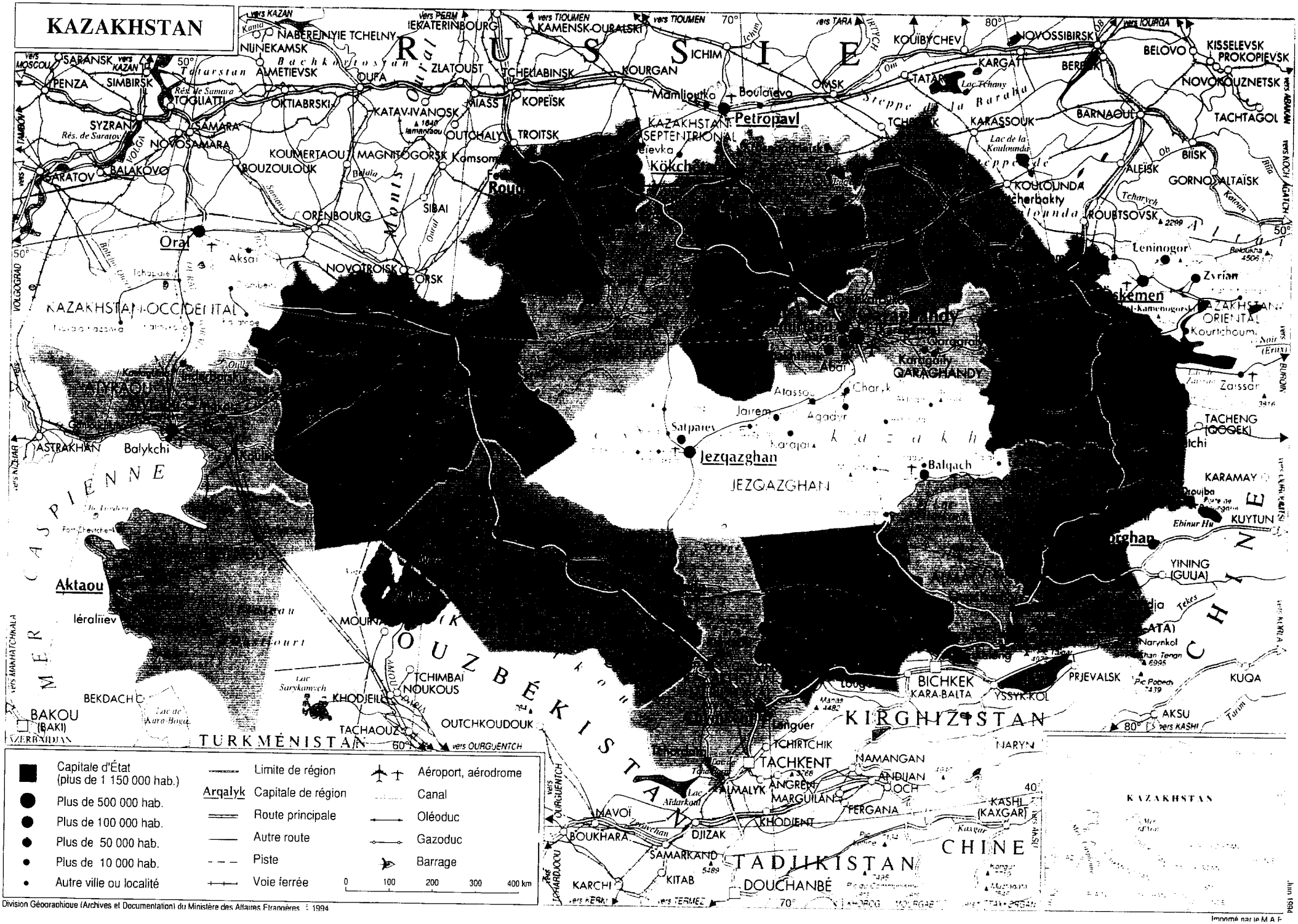
Georgia

The railways comprises 1,500 kilometres. The line connecting the Azeri network to the Georgian port of Baku is of major interest to freight movements between Central Asia and Europe. The line goes from Gardabani (the border between Georgia and Azerbaidjan) to Samtredia (250 km) through Tbilissi. At Samtredia, two branches connects respectively Batumi and Poti. The distances are 401 km between Gardabani and Batumi and 363 km between Gardabani and Poti. Both links are double track from Gardabani to Samtredia (295 km) and from there single track to Batumi (106 km) and to Poti (68 km).

The principal road in Georgia, the « Magisterial », runs from the Azeri border through Tbilissi, to the Black sea (Sukhumi); There is trifurcating system at Samtredia, close to the black sea, where two roads provide access to Poti and Batumi. The roads runs along the Valley between the two ranges of the Caucasus. The pavement is acceptable. The secondary roads appears to be in poor condition. Container transit traffic by this road transport, very little at present, may be developed.

Armenia

The railways of Armenia is made up of around 800 route-kilometres. Rail lines links Erevan to Baku and Tbilissi. The connection with Tbilissi goes through Akhurian and Giumry and touch the Georgian territory at Bagratashen. The entire link is single track. Small section between Giumry and Akhurian is diesel operated. From to Bagratashen (157 Km) the line is single track and electrified. Due to political disagreements with neighbouring countries (Turkey and Azerbaidjan), this is the only railways in operation to the port of Poti and Batumi (Yerevan-Giumri--Airum-Bagrataschen-Georgia). From Poti and Batumi to Armenia, shipments are forwarded both road and rail.


KAZAKHSTAN
RUSSIE
KAZAKHSTAN-OCCIDENTAL
KAZAKHSTAN-ORIENTAL
KAZAKHSTAN SEPTENTRIONAL
Petropavl
Kökchetav
Oral
Aktaou
Atyraou
Jezqazghan
JEZGAZGHAN
QARAGHANDY
Karaganda
Temirtau
Balqach
Saran
Satpaev
Jairem
Agadyr
Atasou
Aktogay
Abai
Zaïssan
Zyrianovsk
Leninogorsk
Oskemen
Kourtchoum
TACHENG (GOQEK)
KARAMAY
KUYTUN
YINING (GUULA)
Narynkol
PRJEVALSK
KUQA
AKSU
BICHKEK
KARA-BALTA
YSSYK-KOL
KIRGHIZISTAN
TACHKENT
CHIRTCHIK
NAMANGAN
ANDIJAN
OCH
ANGREN
ALMALYK
MARGUILAN
FERGANA
KHODJENT
KASHI (KAXGAR)
CHINE
MAVOI
BOUKHARA
DJIZAK
SAMARKAND
KITAB
KARCHI
TADJIKISTAN
DOUCHANBÉ
TURKMÉNISTAN
OUZBÉKISTAN
BAKOU (BAKI)
AZERBAIDJAN
MER CASPIENNE
TCHIMBAI
NOUKOUS
KHODJEILI
TACHAOUZ
OUTCHKOUDOUK
BEKDACHI
Lac Sarykamych
Lac de Kara-Boga
Lac Aydarkoul
Lac Tchany
Lac de la Koulounda
Capitale d'État (plus de 1 150 000 hab.)
Plus de 500 000 hab.
Plus de 100 000 hab.
Plus de 50 000 hab.
Plus de 10 000 hab.
Autre ville ou localité
Limite de région
Arqalyk Capitale de région
Route principale
Autre route
Piste
Voie ferrée
Aéroport, aérodrome
Canal
Oléoduc
Gazoduc
Barrage
0 100 200 300 400 km
KAZAKHSTAN
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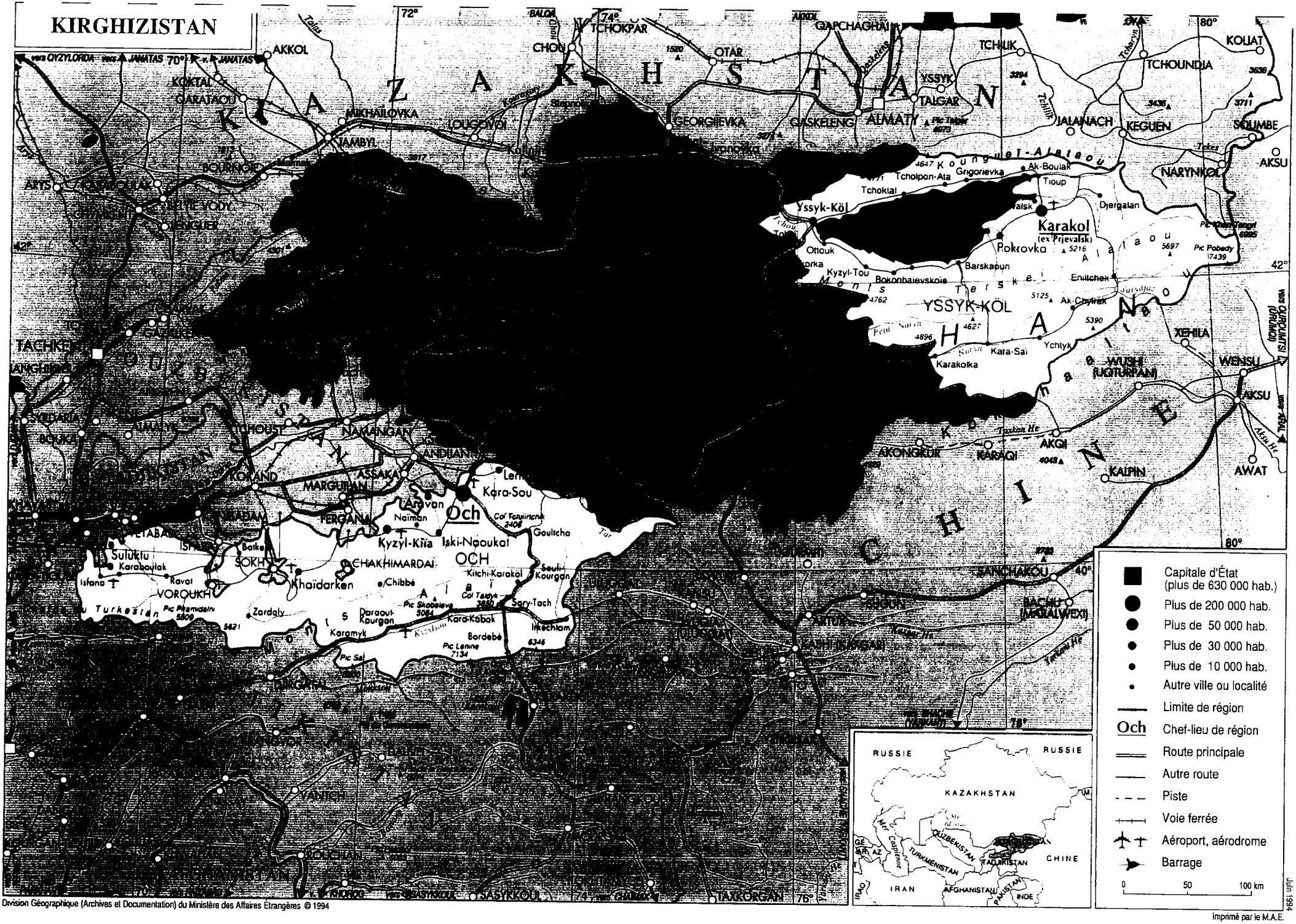
Juin 1994



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Capitale d'État (plus de 2 100 000 hab.)
Plus de 300 000 hab.
Plus de 100 000 hab.
Plus de 50 000 hab.
Plus de 30 000 hab.
Plus de 10 000 hab.
Autre ville ou localité
Limite de région
Navoï Capitale de région
Route principale
Autre route
Voie ferrée
Aéroport, aérodrome
Canal
Gazoduc
Barrage
Site historique
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KAZAKHSTAN
TURKMÉNISTAN
KIRGHIZISTAN
TADJIKISTAN
AFGHANISTAN
IRAN
CHINE
PAKISTAN
KARAKALPAKIE (Région autonome)
Steppe de la Faim
Karakoum
Noukous
Ourguench
Khiva
Khodjeili
Koungrad
Samarkand
Kattakourgan
Tachkent
Tchirtchik
Ianghiioul
Namangan
Kokand
Fergana
Termez
TACHKENT
SAMARKAND
DOUCHANBÉ
BICHKEK
DJAMBOUL
TCHIMKENT
TOURKESTAN
KZYL-ORDA
DJOUSSALY
NOVOKAZALINSK
ARAKOL
TCHIILI
SOUZAK
IANYKOURGAN
KENTAOU
JANATAS
KARATAOU
ARYS
LENGER
TCHARDARA
LEBAP
DARGAN-ATA
KABAKLY
ELDJIK
TCHARDJOOU
KOMSOMOLSK
BAÏRAM-ALI
MARY
KHAOUZ-KHAN
TEDJEN
DOUCHAK
TCHAATCHA
KERKI
GAOURDAK
TCHARCHANGA
AQTCHAH
MAZĀR-É CHARIF
BALKH
KHOLM
DARVAZA
KIZYL-ARVAT
BEÏNEOU
Karakalpakiia
Jaslyk
Moinak
Kazakhdaria
Takhtakoupyr
Tchimbai
Khalkabad
Manguit
Berouni
Tourtkoul
Khazarasp
Takhiatach
KALININE
TACHAOUZ
Choumanai
PENDJIKENT
AÏNI
OURA-TIOUBÉ
KHOUDJAND
KHAIDARKEN
SARY-TACH
IRKECHTAM
KARAMYK
DJIRGATAL
KALAÏKHOUM
KOUDARA
KHOROG
LANGAR
SARHAD-É WAKHAN
ORDJONIKIDZEABAD
NOUREK
DANGARA
KOULIAB
KOURGAN-TIOUBÉ
KOLKHOZABAD
FAÏZĀBĀD
BARAK
QEZEL QAL'A
OCH
DJALAL-ABAD
KOK-IANGAK
KARA-KOUL
TACH-KOUMYR
TOKTOGOUL
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MERKÉ
KAINDA
KARA-BALTA
LOUGOVOÏ
TCHOU
GOULTCHA
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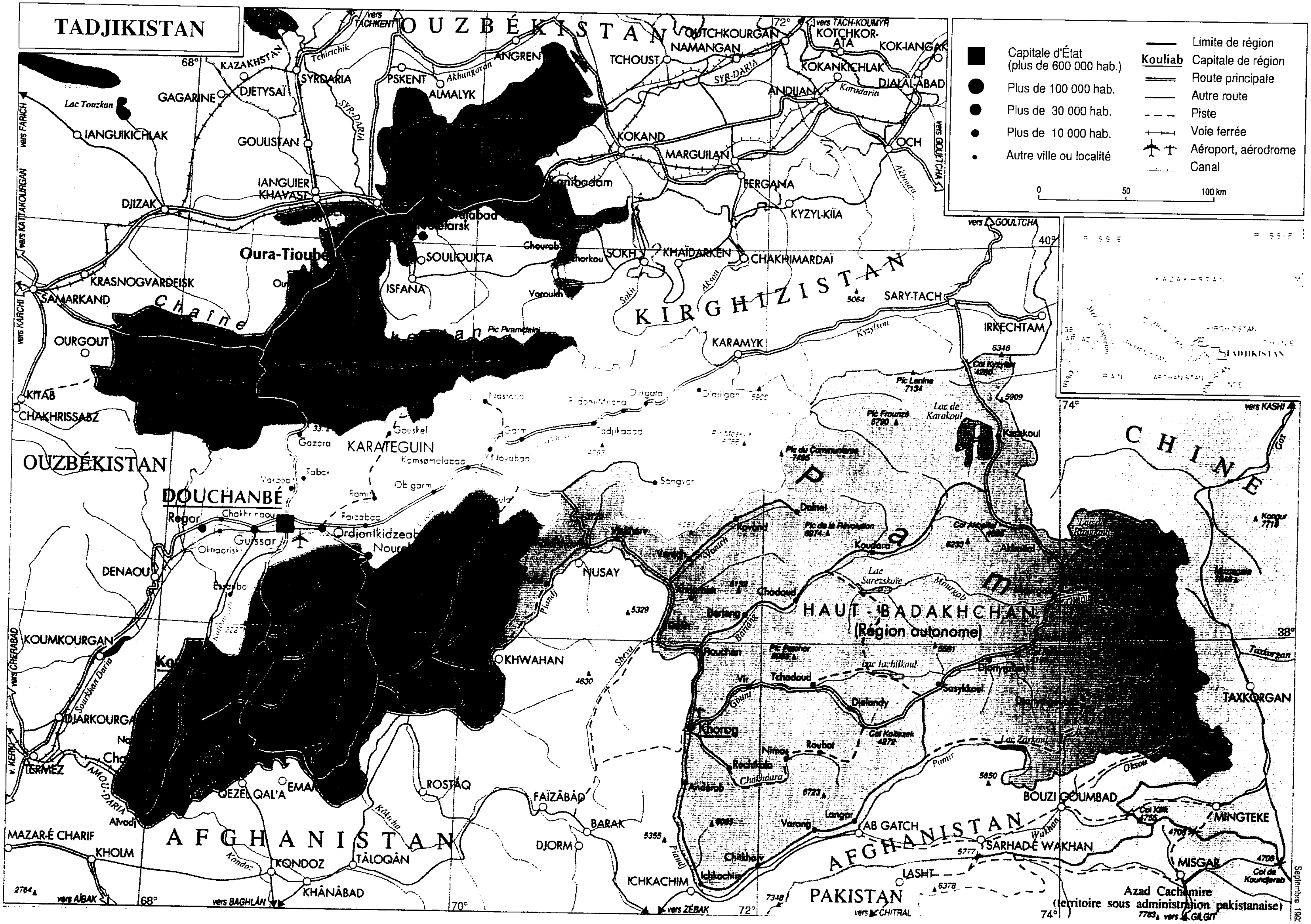
Lac de Toktogoul
Canal du Karakoum
SYR-DARIA
RUSSIE
INDE

Octobre 19



TADJIKISTAN
Capitale d'État (plus de 600 000 hab.)
Plus de 100 000 hab.
Plus de 30 000 hab.
Plus de 10 000 hab.
Autre ville ou localité
Limite de région
Kouliab Capitale de région
Route principale
Autre route
Piste
Voie ferrée
Aéroport, aérodrome
Canal
0 50 100 km
OUZBÉKISTAN
KIRGHIZISTAN
CHINE
AFGHANISTAN
PAKISTAN
DOUCHANBÉ
Oura-Tioube
KARATEGUIN
HAUT-BADAKHCHAN (Région autonome)
Khorog
SAMARKAND
DJIZAK
KOKAND
NAMANGAN
ANDIJAN
OCH
FERGANA
MARGUILAN
SARY-TACH
IRKECHTAM
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DENAOU
Regar
Gurssar
Ordjonikidzeabad
KONDOZ
TÂLOQÂN
FAÏZÂBÂD
ROSTÂQ
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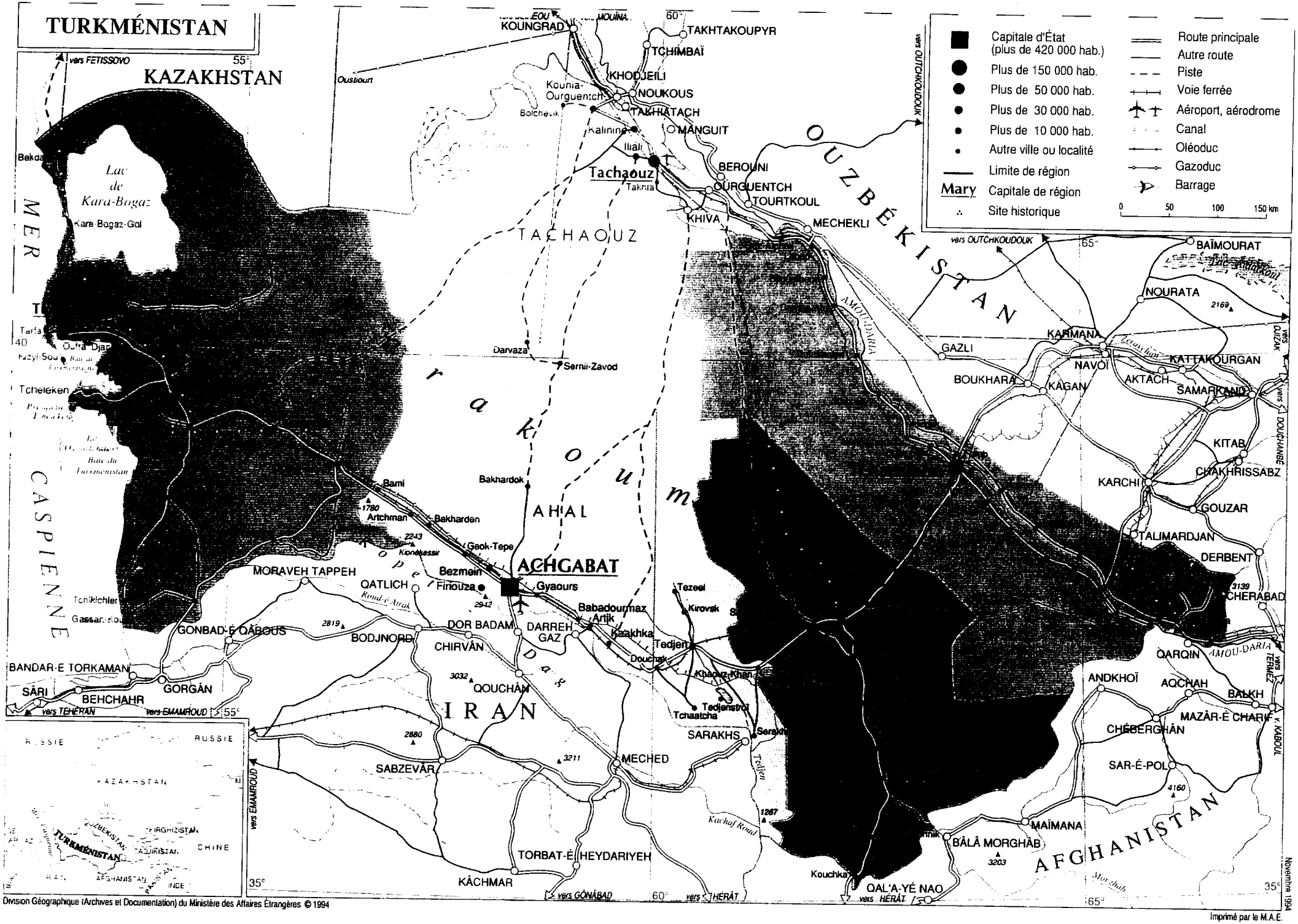
Septembre 1992



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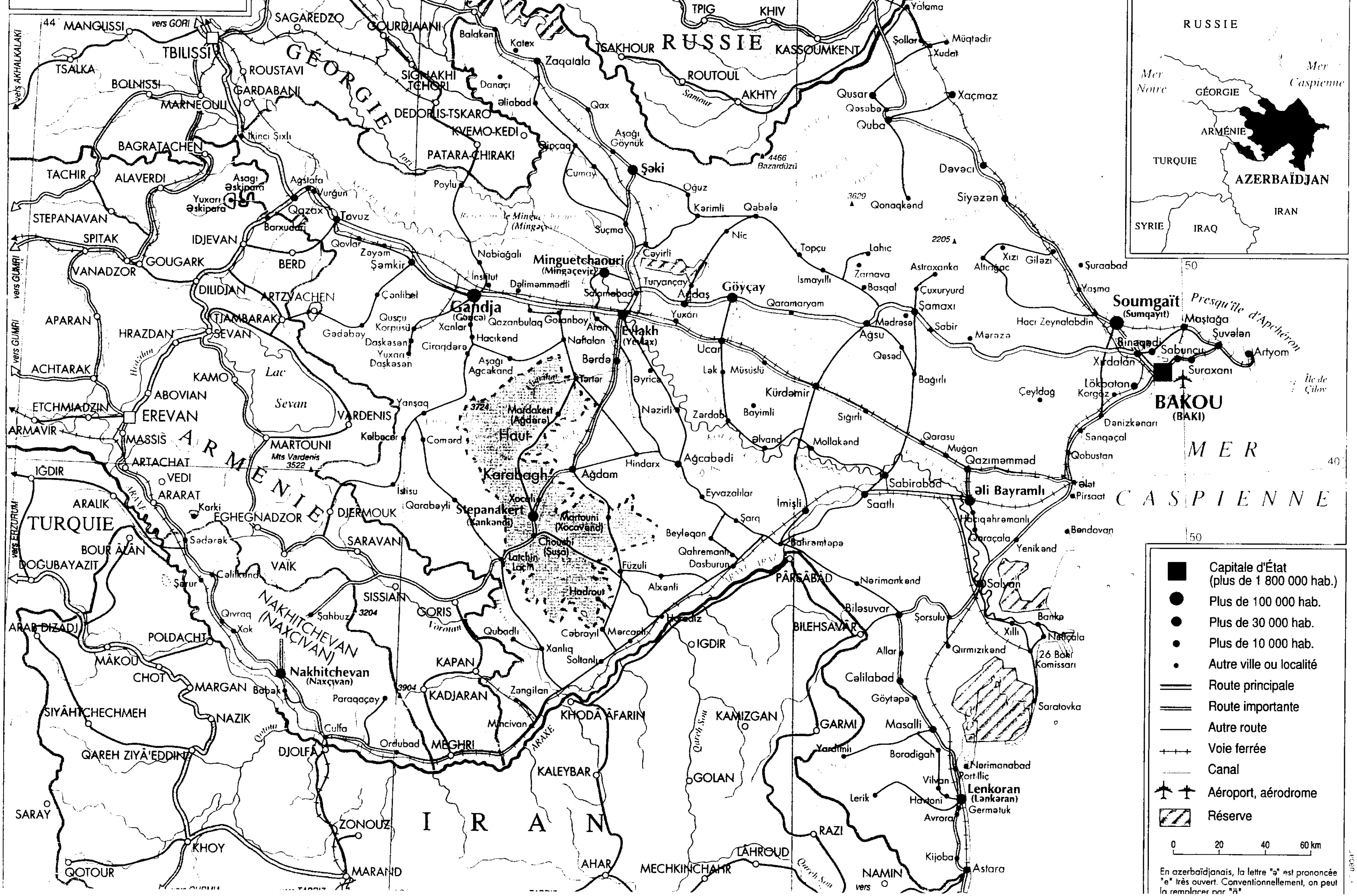
AZERBAÏDJAN

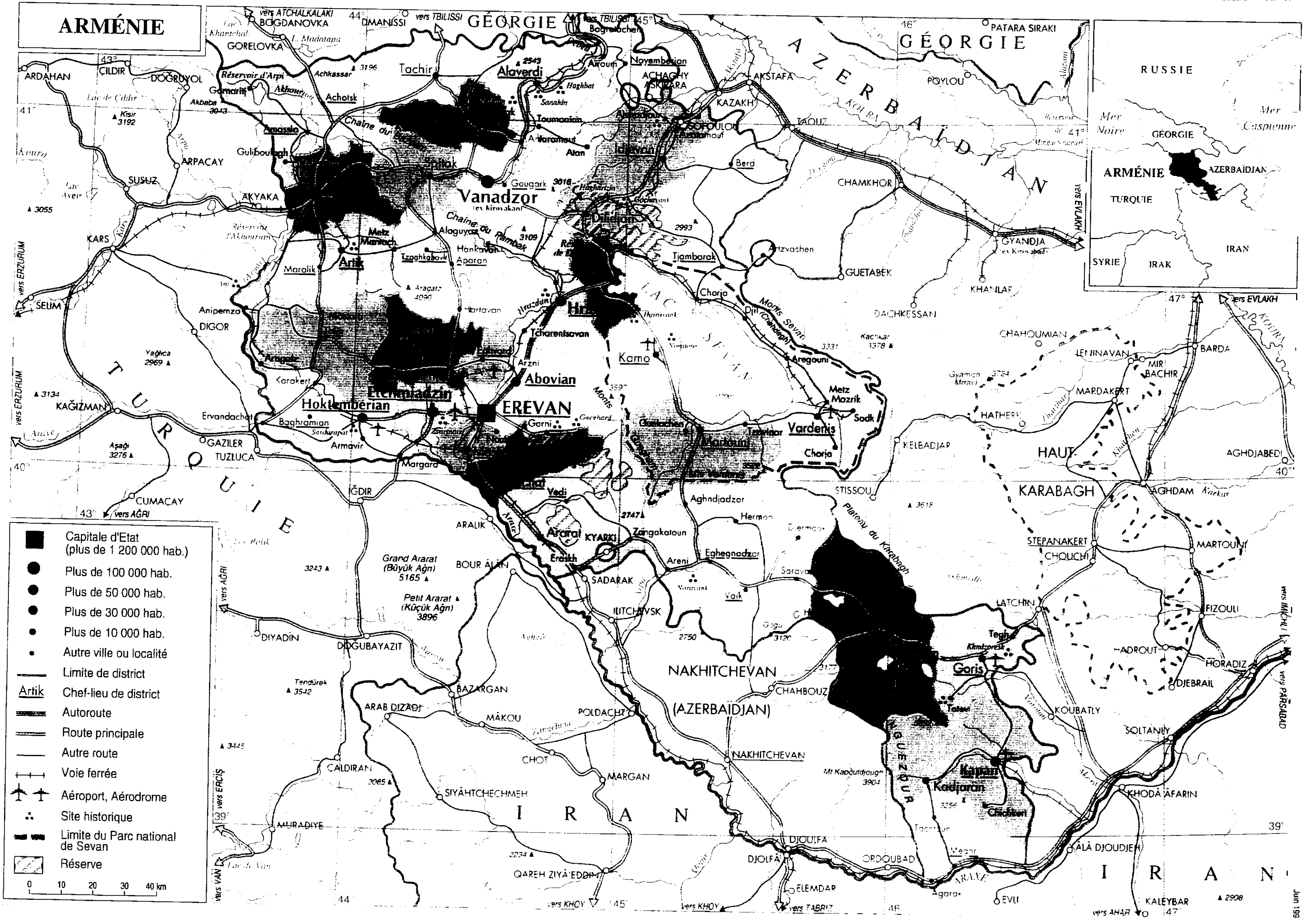


GÉORGIE

RUSSIE
GÉORGIE
Mer Noire
Mer Caspienne
ARMÉNIE
AZERBAÏDJAN
TURQUIE
SYRIE
IRAQ
IRAN
TERRITOIRE DE KRASNODAR
RÉPUBLIQUE DES KARATCHAÏS-TCHERKESSES
KABARDO-BALKARIE
TERRITOIRE DE STAVROPOL
INGOUCHIE
TCHÉTCHÉNIE
DAGHESTAN
OSSÉTIE DU NORD
OSSÉTIE DU SUD
ABKHAZIE
MINGRÉLIE
SVANETIE
KARTLIE
KAKHÉTIE
MER NOIRE
TURQUIE
ARMÉNIE
AZERBAÏDJAN
TBILISSI
Roustavi
Koutaïssi
Soukhoumi
Batoumi
Tskhinvali
Zougdidi
Poti
Gori
Gagra
Tkvartcheli
Otchamtchira
Samtredia
Zestafoni
Khachouri
Borjomi
Akhaltsikhe
Akhalkalaki
Telavi
Kaspi
Ozourgueti (ex Makharadzé)
Kobouleti
Tchiatoura
Tkibouli
Senaki
Monts du Bzyb
Monts du Kodori
Janvier 1995

Capitale d'État (plus de 1 000 000 hab.)
Plus de 100 000 hab.
Plus de 30 000 hab.
Plus de 10 000 hab.
Autre ville ou localité
Limite de région
Batoumi Capitale de région
Route principale
Route importante
Autre route
Voie ferrée
Aéroport, aérodrome
Parc national

0 50 km


ARMÉNIE
GÉORGIE
AZERBAÏDJAN
TURQUIE
IRAN
NAKHITCHEVAN
(AZERBAÏDJAN)
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LAC SEVAN
EREVAN
Vanadzor
Abovian
Hoktembérian
Etchmiadzin
Alaverdi
Idjevan
Dilidjan
Kamo
Vardenis
Goris
Kapan
Kadjaran
Artik
Spitak
Aparan
Tcharentsavan
Ararat
Erasch
Eghegnadzor
Vaïk
STEPANAKERT
LATCHIN
KELBADJAR
KARS
ARDAHAN
IĞDIR
DOGUBAYAZIT
DJOULFA
ORDOUBAD
GYANDJA
KAZAKH
AKSTAFA
BARDA
AGHDAM
FIZOULI
DJEBRAIL
Grand Ararat (Büyük Ağrı) 5165
Petit Ararat (Küçük Ağrı) 3896
Aragatz 4090
Chaîne du Pambak
Plateau du Karabagh
Monts Sevan
vers TBILISSI
vers EVLAKH
vers ERZURUM
vers AĞRI
vers VAN
vers KHOY
vers TABRIZ
vers AHAR
vers PARSABAD
RUSSIE
Mer Noire
Mer Caspienne
IRAK
SYRIE
Capitale d'Etat (plus de 1 200 000 hab.)
Plus de 100 000 hab.
Plus de 50 000 hab.
Plus de 30 000 hab.
Plus de 10 000 hab.
Autre ville ou localité
Limite de district
Artik Chef-lieu de district
Autoroute
Route principale
Autre route
Voie ferrée
Aéroport, Aérodrome
Site historique
Limite du Parc national de Sevan
Réserve
0 10 20 30 40 km
Juin 199

ANNEX 5: RAIL CONTAINER TERMINALS IN TRACECA REGION

Railway Container Terminals in TRACECA-Region

Country	Railway Administration	Terminal	Location/Railway Junction	Location Related to the Traffic flow	Remarks
Armenia	Armenian Railway	Vanadzor (former Kirovakan)	Vanadzor	Tbilissi - Gyumri - Yerevan line	lifting capacity of cranes 20 t
Armenia	Armenian Railway	Abovyan	Yerevan	Idzhevan - Yerevan - Masis line	lifting capacity of cranes 20 t
Armenia	Armenian Railway	Gyumri (former Leninakan)	Gyumri	Tbilissi - Gyumri - Yerevan line	lifting capacity of cranes 20 t
Armenia	Armenian Railway	Karmir Blur	Yerevan	Idzhevan - Yerevan - Masis line	lifting capacity of cranes 20 t
Armenia	Armenian Railway	Sevan 2	Razdan/Sevan	Idzhevan - Yerevan - Masis line	lifting capacity of cranes 24 t
Azerbaijan	Azerbaijan Railway	Gyandsha	Gyandsha	main TRACECA-Corridor	lifting capacity of cranes 10 t, 2 cranes available (handling together 20' containers !!!)
Azerbaijan	Azerbaijan Railway	Khyrdalan	Baku	main TRACECA-Corridor	terminal out of operation for more than 1 year, in very bad condition, 2 older "Valmet" container lift trucks (16 t lifting capacity, 1 damaged, 1 out of operation), 3 cranes for 20 t lifting capacity (2 of them damaged), visited during field mission
Georgia	Georgian Railway	Samtredia 2	Samtredia	main TRACECA-Corridor	lifting capacity of cranes 10 t, 2 cranes available (handling together 20' containers !!!), at present out of operation
Georgia	Georgian Railway	Tbilissi-Tov.	Tbilissi	main TRACECA-Corridor	lifting capacity of cranes 20 t, 2 cranes available, visited during field mission
Kazakhstan	Alma-Atinskaya Railway	Alma-Ata 2	Almaty	main TRACECA-Corridor	4 cranes for 20 t, visited during field mission
Kazakhstan	Alma-Atinskaya Railway	Druzhba	Druzhba/border station with China	main TRACECA-Corridor	only unloading terminal on the interface between Russian broad gauge and European standard gauge used in China; 2 cranes with 30.5 t lifting capacity, covered terminal ! (location often exposed to stormy winds)

Kazakhstan	Alma-Atinskaya Railway	Dzhambul	Dzhambul	main TRACECA-Corridor	lifting capacity of cranes 20 t
Kazakhstan	Alma-Atinskaya Railway	Semipalatinsk	Semipalatinsk	Kazakh - Siberian route	lifting capacity of cranes 20 t
Kazakhstan	Alma-Atinskaya Railway	Taldy-Kurgan	Taldy-Kurgan	branch-terminal line, about 50 km distance to TRACECA-corridor in the Almaty - Aktogay section	lifting capacity of cranes 24 t
Kazakhstan	Alma-Atinskaya Railway	Tchimkent	Tchimkent	main TRACECA-Corridor	lifting capacity of cranes 20 t
Kazakhstan	Alma-Atinskaya Railway	Zashita	near Ust-Kamenogorsk	branch-terminal line to the Kazakh - Siberian route	lifting capacity of cranes 20 t
Kazakhstan	Southern Ural Railway (Russia)	Petropavlovsk	Petropavlovsk	Petropavlovsk corridor the southern way of the Russian Transsiberian route (the terminal as well as the whole corridor is leased to the Russian railways)	
Kazakhstan	Tselinnaya Railway	Akmola (former Tselinograd)	Akmola	Petropavlovsk - Akmola - Karaganda - Tchu line (part of a Northern Transasia corridor)	lifting capacity of cranes 20 t
Kazakhstan	Tselinnaya Railway	Arkalyk	Arkalyk	branch-terminal line to the Akmola - Southern Ural (Russia) line	lifting capacity of cranes 20 t
Kazakhstan	Tselinnaya Railway	Dzhezkazgan	Dzhezkazgan	branch-terminal line to the Petropavlovsk - Akmola - Karaganda - Tchu line	lifting capacity of cranes 20 t
Kazakhstan	Tselinnaya Railway	Ekibastus	Ekibastus	Akmola - Pavlodar line in the North-east part of Kazakhstan	lifting capacity of cranes 20 t

Kazakhstan	Tselinnaya Railway	Karaganda	Karaganda	Petropavlovsk - Akmola - Karaganda - Tchu line (part of a Northern Transasia corridor)	lifting capacity of cranes 24 t
Kazakhstan	Tselinnaya Railway	Koktchetav	Koktchetav	Petropavlovsk - Akmola - Karaganda - Tchu line (part of a Northern Transasia corridor connecting Siberia to Kazakhstan and China)	lifting capacity of cranes 20 t
Kazakhstan	Tselinnaya Railway	Kustanaj	Kustanaj	Koktchetav - Southern Ural line to Russia	lifting capacity of cranes 20 t
Kazakhstan	Tselinnaya Railway	Pavlodar Yuzhn.	Pavlodar	Koktchetav/Akmola - Siberian route to Russia	lifting capacity of cranes 20 t
Kazakhstan	Western-Kazakh Railway	Aktyubinsk	Aktyubinsk	Southern Transasia Route (China/Kazakhstan-Russia)	lifting capacity of cranes 20 t
Kazakhstan	Western-Kazakh Railway	Atyrau (Guryev 2)	Atyrau (former Guryev)	Connecting route between Russian and Western Kazakhstan	lifting capacity of cranes 20 t
Kazakhstan	Western-Kazakh Railway	Kzyl-Orda	Kzyl-Orda	Southern Transasia Route (China/Kazakhstan-Russia)	lifting capacity of cranes 20 t
Kazakhstan	Western-Kazakh Railway	Mangyshlak (Aktau)	Aktau	branch-terminal line to the port of Aktau (included in TRACECA-programme, but not on main corridor)	lifting capacity of cranes 20 t
Kazakhstan	Western-Kazakh Railway	Tyuratam	Tyuratam	Transasia Route (China/Kazakhstan-Russia)	lifting capacity of cranes 20 t
Kazakhstan	Western-Kazakh Railway	Zhilaevo	Uralsk	Uralsk-corridor in the outermost Northwest part of Kazakhstan (part of the Southern Transasia Route)	lifting capacity of cranes 20 t
Kyrgyzstan	Kyrgyzskaya Railway	Alamedin	Bishkek	main Kyrgyz railway corridor connecting Bishkek with the main TRACECA-corridor (at Lugovaya station in Kazakhstan)	lifting capacity of cranes 20 t, two cranes available, visited during field mission
Kyrgyzstan	Kyrgyzskaya Railway	Osh	Osh	branch terminal line to Uzbek Fergana valley line	lifting capacity of cranes 20 t, two cranes available
Tadjikistan	Tadjikistan Railway	Dushanbe 2	Dushanbe	branch terminal line Termez - Dushanbe	lifting capacity of cranes 24 t

Tadjikistan	Tadjikistan Railway	Gafurov (former Leninabad)	Gafurov	Fergana valley line	lifting capacity of cranes 20 t
Turkmenistan	State Railway of Turkmenistan	Gazatchak	Gazatchak (near Uzbek border)	Chardzhev - Bejneu line, connecting Central Asia with Western Kazakhstan and Russia	lifting capacity of cranes 20 t
Turkmenistan	State Railway of Turkmenistan	Mayskaya	Mary	main TRACECA-Corridor	lifting capacity of cranes 20 t
Turkmenistan	State Railway of Turkmenistan	Nebit-Dag	Nebit-Dag	main TRACECA-Corridor	lifting capacity of cranes 20 t
Turkmenistan	State Railway of Turkmenistan	Obesberdyev-Kuliyevo	Ashgabat	main TRACECA-Corridor	lifting capacity of cranes 20 t, visited during field mission
Turkmenistan	State Railway of Turkmenistan	Serger	Chardzhev	main TRACECA-Corridor	lifting capacity of cranes 25 t, 2 cranes available, visited during field mission
Turkmenistan	State Railway of Turkmenistan	Tashaus	Tashaus	Chardzhev - Bejneu line, connecting Central Asia with Western Kazakhstan and Russia	lifting capacity of cranes 20 t
Turkmenistan	State Railway of Turkmenistan	Turkmenbashi (former Krasnovodsk)	Turkmenbashi	main TRACECA-Corridor	lifting capacity of cranes 20 t
Uzbekistan	State joint-stock railway company "Uzbek Railways"	Andizhan Sev.	Andizhan	Fergana valley line (southern section)	lifting capacity of cranes 20 t
Uzbekistan	State joint-stock railway company "Uzbek Railways"	Assake	Andizhan	Fergana valley line (southern section)	lifting capacity 40 t, private terminal (Daewoo)
Uzbekistan	State joint-stock railway company "Uzbek Railways"	Bukhara 2	Bukhara	main TRACECA-Corridor	lifting capacity of the crane 20 t , only 1 crane available, visited during field mission
Uzbekistan	State joint-stock railway company "Uzbek Railways"	Dzhizak	Dzhizak	main TRACECA-Corridor	lifting capacity of cranes 20 t
Uzbekistan	State joint-stock railway company "Uzbek Railways"	Kakir	Kokand	Fergana valley line (southern section)	lifting capacity of cranes 20 t

Uzbekistan	State joint-stock railway company "Uzbek Railways"	Karshi	Karshi	Samarkand/Bukhara - Termez line to the outermost East of Turkmenistan and to southern Uzbekistan and Tadzhikistan	lifting capacity of cranes 20 t
Uzbekistan	State joint-stock railway company "Uzbek Railways"	Margilan	Fergana	Fergana valley line (southern section)	lifting capacity of cranes 20 t
Uzbekistan	State joint-stock railway company "Uzbek Railways"	Nukus	Nukus	branch terminal line to the Chardzhev - Bejneu line, connecting Central Asia with Western Kazakhstan and Russia	lifting capacity of cranes 20 t
Uzbekistan	State joint-stock railway company "Uzbek Railways"	Raustan	Namangan	Fergana valley line (northern section)	lifting capacity of cranes 20 t
Uzbekistan	State joint-stock railway company "Uzbek Railways"	Shumilovo (old)	Tashkent	main TRACECA-Corridor	lifting capacity of cranes 20 t, two cranes available, railway-owned terminal for 20'-containers
Uzbekistan	State joint-stock railway company "Uzbek Railways"	Shumilovo (Shoshtrans)	Tashkent	main TRACECA-Corridor	2 "Boss" Reach stacker for 40'-containers, additionally 2 older cranes for handling of empty containers, most modern terminal in TRACECA region, owned by the Shoshtrans Company, a Russian-Uzbek-Swiss company (with participation of the Uzbek Railways") visited during field mission
Uzbekistan	State joint-stock railway company "Uzbek Railways"	Tintchlik	Bukhara	branch terminal line to the main TRACECA-Corridor near Navoi (distance to the TRACECA-Corridor about 20 km)	lifting capacity of cranes 20 t
Uzbekistan	State joint-stock railway company "Uzbek Railways"	Ulugbek	Samarkand	main TRACECA-Corridor	lifting capacity of cranes 20 t
Uzbekistan	State joint-stock railway company "Uzbek Railways"	Urgentch	Urgentch	Chardzhev - Bejneu line, connecting Central Asia with Western Kazakhstan and Russia	lifting capacity of cranes 20 t

ANNEX 6: Programme OF THE E.U STUDY TOUR AND LIST OF PARTICIPANTS

TACIS- TRACECA PROGRAMME/ FORWARDING MULTIMODAL TRANSPORT
EUROPEAN STUDY TOUR PROGRAMME (15 - 29 JUNE 1996)

Date	*Time*	*Event*	*Organisation / Contact*	*Remarks*
SATURDAY 15	From 10 a.m. to 11 p.m	Arrival of Participants	Hotel « OPER »: Str, Prehbahn 15, Tel : 40 35 60 10/ Fax: 40 35 60 1 31 Hamburg	All the participants are invited to get the HOTEL OPER by Taxi. The Hotel is close to the Pammtour rail station (15 min from the airport/ about 30 DM by taxi).
	19H00 p.m.	Welcome meeting with José CACERES. Project Manager.		
SUNDAY 16		Free	Free day in Hambourg	Hotel « OPER » Hamburg.
MONDAY 17	9H30 a.m.	Pick up of the group at the St Pauli-Landungsbrucken (Bruke 5) for an extensive tour of the harbour in the « Senatsbarkasse » (boat owned by the government of Hamburg).	The Hamburger Hafen und Lagerhaus Mr. Gerhard ANGERER Tel: 49 40 30 88 35 21 Fax: 49 40 30 88 33 55 and	Interpret: Dorte PUTTFARKEN. Tel: (49 40) 47 83 01 Fax:(49 40) 48 16 35
	11H00 a.m.		The International Union of Rail-Road Companies Mrs Susanne KUSCHEL Tel: 32 2 425 47 93 Fax: 32 2 425 38 27	Transport: a bus is picking us up to the Hambourg Hafen und Lagerhaus.
	12H30 p.m.	• Visit of the HHLA container Terminal at Burchardkai: • Meeting with the HHLA management • Guided tour	Port of Hamburg: Terminal Hamburger Hafen und Lagerhaus (HHLA)	Transport: the « Senatsbarkasse », boat owned by the government of Hamburg
	14H00 p.m.	Lunch		Lunch: in the HHLA Restaurant at Burchardkai
		Return to the City of Hamburg		

Date	*Time*	*Event*	*Organisation / Contact*	*Remarks*
TUESDAY 18	11H00 a.m.	Visit of the Hamburg-Billwerder Combined Transport Terminal	Terminal Hamburg-Billwerder Mr Rurh Kombiverkehr, Gebietsleiter Norddeutschlan. Tel: 49 40 78 91 206 Fax: 49 40 78 13 47	Interpret: : Dorte PUTTFARKEN
	17H30 p.m.	Flight from Hamburg to Paris		Flights Tickets: José CACERES
	19H30 p.m.	Arrival in Paris	Hotel « IBIS »	Transport: Bus FLAB Hotel « IBIS », la Bastille.
WEDNESDAY 19	10H30 a.m.	Guided Visit of the LOUVRE	Musée du Louvre, Paris Béatrice DUBOST Tel: 40 20 51 66 Fax: 40 20 58 24	Interpret: Aurelie GAUSSELIN. Transport: Paris Metro
	14H00 p.m.	Free		Lunch:
THURSDAY 20	9H30 a.m.	Meeting with the authorities from the French Ministry of Transport and Communications. Subject: The Financing of Transports Infrastructure.	FRENCH MINISTRY OF TRANSPORT AND COMMUNICATIONS Mr MOUSNIER-LOMPRE. Tel: 40 81 28 05 Fax 40 81 27 70	Interpret: Mme TOMASHEVSKI Transport: RER
	18H00 - 22H00 p.m.	Visit of the Valenton Combined	SNCF and CNC (Compagnie Nouvelle de Conteneurs) Mr. Georges VIALLA Tel: 40 16 64 29 Fax: 40 16 64 56	

Date	*Time*	*Event*	*Organisation / Contact*	*Remarks*
FRIDAY 21	8H30 a.m.	Visit of one of the most important Combined Transport Paris Terminal (Creteil)	NOVATRANS (Rail-Road Transport Company)	Interpret: Mme TOMASHEVSKI Transport: FLAB Bus
	11H00 p.m.	• Meeting with the Management: • the « Groupement National du transport Combiné »,GNTC. • Film related to « combined transport techniques)	The GNTC is a French Combined Transport Group of Companies. Mr BRUNIER	
	11H45 a.m.	• Meeting with the management of T.A.V.	The T.A.V; is a French multimodal operators, specialised in Rail-Road Transport by swap bodies.	
	12H30 p.m.	Lunch		
	15H00 p.m.	• Presentation of a Forwarding Company intermodal activities	Calberson International. Mr. Marc Landrin. Road Expert for the Project. Tel: 40 64 73 72 Fax 43 27 23 96	
SATURDAY 22 **SUNDAY 23**	Paris Paris	Free Free		
MONDAY 24	6H56 a.m.	Travel Paris-Metz	INTERCONTAINER. Mr. Pierre Schmelter. President of Intercontainer. Mr. Kieffer. Director of Intercontainer. Tel: 41 61 278 23 16 (Bale) Fax: 41 61 278 23 12 (Bale) Lunch:	Interpret:: Mme TOMASHEVSKI
	10H00 a.m.	• Presentation of Intercontainer • Examine of possible links with TRACECA countries		Transport Hotel - Gare de l'EST: Metro Transport Paris- Metz: TGV
	13H00 p.m.	Lunch		Transport Gare- Terminal: Mr KIEFFAR
	15H00 p.m.	Visit of the Metz International « Nodal Point »		Lunch
	9H00 p.m.	Travel from Metz to Paris		Transport: TGV

Date	*Time*	*Event*	*Organisation / Contact*	*Remarks*
TUESDAY 25	9H00 a.m. 19H00 p.m.	Coordination meeting with the Expert Team. • Pre -evaluation of the Study Tour. • Possible re-orientation of the Program • Special dinner with the management of BCEOM and SYSTRA.	Hotel « IBIS» Organised by SYSTRA and BCEOM	Interpret: Mme TOMASHEVSKI Restaurant: « le Bois Doré »
WEDNESDAY 26	9H00 a.m. 12H00 15H29 p.m. 18h54	Meeting with the Management of the « EUROPEAN INTERMODAL ASSOCIATION ». • Activities of the Association • Relations with Eastern Countries • Possible development wit the TRACECA countries. Travel from Paris to Avignon Arrival in Avignon	« EUROPEAN INTERMODAL ASSOCIATION Mr Bernard TEILLET. Director of the Association. Tel: 514 42 07 Fax: 514 56 54 Head Oficce: Brussels/ Belgium. Place: SYSTRA Head Office. 5 Av du Coq. Paris Lunch	Interpret::Mme TOMASHEVSKI Transport: Metro - RER Transport Paris- Avignon: TGV Hotel FIMOTEL: 8 Bd St Dominique 84 Avignon
THURSDAY 27	9H00 a.m. 14H00 p.m. 16H00 p.m.	Visit of the Multimodal Complex of Avignon: • Marketing of the Intermodal Traffic • Advantages of the Intermodality • Operating techniques • Visit of the Terminal City tour Travel from Avignon to Paris	NOVATRANS Mr Claude AROCAS. Chief of the Centre Mr; LESIEUR; Marketing Director. Tel: 90 86 80 25 : 90 86 38 32 Fax: 90 86 17 02 .	Interpret:: Mme TOMASHEVSKI Transport: TGV

Date	*Time*	*Event*	*Organisation / Contact*	*Remarks*
FRIDAY 28	9H30 a.m.	Meeting with the Management of BCEOM and special lunch	BCEOM Jean KOCH, General Manager Paul Marie RINGWALD. Division Manager José CACERES. Project Manager. Paul PEZANT, Planner Economist.	Interpret: Mme TOMASHEVSKI Lunch: BCEOM
		Evaluation of the Study Tour: • Information and training needs • Possible Investment Projects • shipments along the TRACECA corridor.	 Paul Marie RINGWALD. Division Manager José CACERES. Project Manager. Paul PEZANT, Planner Economist.	
SATURDAY 29 **SUNDAY 30** **MONDAY 31**		Departure of the participants to their respective countries.		

STUDY VISIT IN E.U COUNTRIES

Multimodal Transport Delegation from Central Asian and Caucasian countries

ARMENIA :

M. Gerbert AMBARTSOUMIAN, Chief of Foreign Relations Department within the Ministry of Transport and Communications of the Republic of Armenia.
M. Levon AKOPIAN, First Deputy Manager of the Armenian Railways

KAZAKHSTAN

Mr Serik ALIGUZHINOV, First Vice Minister of Transports and Communications
Mr. Anatoliy ZAVYALOV, General Manager of « KAZAVTOTRANS »
Mr. Vladimir UTEBEKOV, General Manager of ISKOMTRANS (Research Institute for Transport Sector Complex Problems).

AZERBAIDJAN

M Ikram SADIKHOV, Head of the Transport Department within the Ministry of Economics.
M Musa MAMEDOV, Deputy Manager of the Port of Baku.

UZBEKISTAN

M. Murat Khalisov ADILOVICH. Deputy Manager of « Shosh-Trans », Multimodal Operator and Chief of the Tashkent Container Terminal.
M. Gulyamov NURITDINOVICH. Deputy Manager of « UZAVTOTRANS Corporation».

TADJIKISTAN

M. Timur MIRZOEV, General Director of the Institut for Studies and Projects of Tadjikistan
M. Bakhrom CHODIEV, Chief Engineer of Tadjik Railways.

GEORGIE

M. Teimuraz GORSHKOV, Chief of Transport Studies within the « National Transport Council of Georgia».
M. Alexander ZIBZIDADZE, Chief Engineer of Georgian Railways.

KYRGHYSTAN

M. Tahkhar KOULIEV. General Director of the Transport Company « DOSTUK »
M. Nurdin SMATOV. Chief of the Automobile Division within the Ministry of Transports.

Annex 7: STUDY TOUR EVALUATION RESULTS

STUDY TOUR EVALUATION

KAZAKHSTAN

Dear Mr. Jose Caceres,

Let us thank you once again for the warm reception during our staying in France and Germany. We hope that all we have seen and heard will help us to find adequate ways of organisation of multi-modal transport in Kazakhstan.

Please, find herein our answers to the questions on study tour evaluation (mission) which are as follows:

1. Yes it is, because, in our opinion, the multi-modal transportation is the present and the future of the transport complex as a whole and it will be able to provide the clients with the most profitable and reliable transport services in the field of an international trade.

2. During the period of the present study tour we have received a complete and relevant information on multi-modal transportation in the West Europe. We hope to receive as an additional information, the drafts of all the accompanying documents which are required to be used in the process of the multi-modal transportation (with customs procedures and without them).

3. Though the visits and contacts with all the companies were of some interest, we would like to point out our particular interest in further development to be forseen with NOVOTRANS. To our mind, an organisational structure and the methods of work of NOVOTRANS can be taken as a basis for the organisation of multi-modal transport companies in Kazakhstan.

4. In Germany: we were impressed by the port of Hamburg. In France: practically everything we have seen is impressive. We have received a lot of information which is being worked at and analysed and we hope to use it in a very effective and reasonable way while organising multi-modal transport system in Kazakhstan.

5. Yes, it is. It is necessary to create (to change the structure of the already existed) multimodal transport companies taking as a basis all the best which we have seen in Germany and France but with our changes in order to make it appropriate to our conditions and possibilities.

6. We would like to get acquainted with the working process particularly in the field of border customs stations with the different track lines, the procedure of customs formalities and customs clearance, passage of wagons and the other operations. We are interested also in automobile borders customs procedures especially on the borders.

7. The programme of the tour was organised at a high level, but sometimes there were some drawbacks in its execution (ex. transport service, interpretation).

8. The interpreter had to be more professional with the knowledge of specific transport terminology. Sometimes it was rather difficult to understand the meaning.

9. See point N°6.

10. Though it was a great interest in the role of the Ministry of Transport, we did not receive enough information about the concrete activity of the Ministry. It was not clear either what was the role of the government in the matters of the organisation of multi-modal transport and which structures of the Ministry took part in a state regulation of the multi-modal transport system.

Best regards,

The First Deputy Minister: S. Aliguzhinov

Members of the delegation: A. Zavyalov; V. Ytebekov

TADJIKISTAN

1. Yes, I do. There is a real demand for such kind of organisation in our Republic where 92% of cargo traffic is carried out by automobile transport.

2. We were interested in the subjects realted to the structure of the organisations visted and the working procedures, in particular in the field of multipurpose terminals (terminals in Hamburg and the terminal of TAB co.). We like you to consider the necessity of giving more details on this matter. On the other hand, the development of the engineering is of particular interest for us. This knowledge can be used by the specialists of our Republic.

3. We have concluded a contract (subcontract) with a transport group (KOMBIVERHKER) for the development of a multimodal transport organisation in our country. We have also invited the representatives from INTERCONTAINER, met in Metz, to visit our Republic.

4. In Germany: The most appropriate experience is that of the company-of multi-modal transport in Hamburg (Kombiverhker). In France: the experience of the small company such as TAB and the visit to INTERCONTAINER turned out to be interesting.

5. The implementation of a multi-modal chain between the counties of TRACECA and EU is an essential need. It is necessary to organise: the base for the development of a network terminals in Tadjikistan; to prepare the legislative base, to simplify at a maximum customs procedures and to join all the technical standards and terms of transportation.

6. We really think that the visit of multi-modal sites in former social countries (Bulgaria, Chekoslovakia etc.) as their are close to our present structure, must be visited.

7. The organisation of terminals and the communication system (possibility to install the equipment of a new generation) needed for the transportation of cargo to the consignee without any delay.

8. The structure and content of working procedures in the terminals have been not presented in a wide and comprehensive way.

9. The content is to be modified: It is necessary to diversify visits to the sites and to present the work of the terminals in a wider way (ex. the existing problems of the terminals, different ways of their solution, etc.). Countries: Bulgaria and Chekoslovakia.

10. After detailed and careful consideration of all the received material, the delegation of the Republic of Tajikistan will send the additional suggestions to the address of the organisers of the multi-modal transport study tour.

29.06 .96 T.D. Mirzoev

UZBEKISTAN

1. Yes, I do.

2. The exchange of the experience between the TRACECA and the European Union and the visits to German and French terminals gave us the necessary information. However, we did not receive enough practical information. For instance, the visits to terminal were often limited to demonstrations of the loading-unloading mechanisms.

3. In Germany I made contacts with the representatives from HHLA. In France: with representatives from INTERCONTAINER

4. In this respect and in general I would like to mention lack of customs problems between the countries of the European Union . Will the customs barriers be eliminated between the countries of TRACECA and the European Union?. In Germany, while visiting the container terminals, I liked the organisation of the working system itself and the availability of wagons for transportation of semi-trailers. In the port of HHL I was interested by the loading - unloading mobil carriers. Regarding France, I think that the organisation of the working process in CNC and NOVOTRANS and the SNCF cargo schedule are particularly interesting.

5. Yes, I do. The implementation of multi-modal chain between Traceca and EU is possible. The only obstacle that may be overcame is the customs barrier. In order to overcome this obstacle it is necessary to create the Customs Union of TRACECA countries.

6. I would wanted to have a detailed information on the organisation of multi-modal carriage in Switzerland and Germany.

7. The organisation of works in Metz carried out by INTERCONTAINER.

8. It would have been better to include also excursions to the historical places of interest in Germany and France.

9. A practical demonstration of the working process of the terminals, beginning with the issuance and completion of shipping documents (documents of carriage) up to the moment of cargo delivery to the consignee.

No answer Signed Mr. Khalisov, Deputy Manager from SHOSH-TRANS

UZBEKISTAN *(M.* Kh. Goulamov).

1. Yes, because it help us to get acquainted with the existing difficulties in a transport system of our region.

2. Yes. But I have to say that It is necessary to cover the role of the road transport in a multi-modal transport operations in a wider way and, at the same time, to show and define all the existing types of transport documents with the corresponding examples.

3. During this particular tour study it was not my aim.

4. In GERMANY: the working procedures in the field of multimodal transport is being fulfilled at a high professional level. In FRANCE: The achievements of scientific and technical progress are widely used (computerisation).

5. I think it is possible. But some difficulties in crossing the borders (periods and delays while making borders customs formalities) must be overcame.

6. I would be interesting to visit the multi-modal sites in Italy and England.

7. What I liked the best was the possibility to communicate with the participants from others Traceca countries. Furthermore, the study visit gave us the possibility to be informed about the latest achievements of the developed companies in the sphere of multi-modal sites.

8. Existing language barrier.

9. In order to achieve the final aim in EU countries, it is necessary to study in details the gains, the drawbacks and the existing difficulties.

10. No answer. Mr. Kh. Goulamov, UZAVTOTRANS Corporation

AZERBAIDJAN

1. On the whole, yes. The visits to the enterprises (companies), discussions with their staff, getting the answers to the questions which we were interested in, all these gave us the positive results.

2. What I have identified is the following: the inexisting interdepartmental barriers within transport insitutions; the concentration of commun matters within one single body, the quality of connections between the different companies, agents (on a contract basis) to perform door-to-door transportation operations and finally, the equipment of the terminals.

3. I Hope to concrete the established contacts with the port of Hamburg and with INTERCONTAINER.

4. On the whole, the opinion is positive, but at the same time, we have noticed that the terminals are not fully loaded.

5. In order to make it possible it is inevitable to solve a number of political and economical problems.

6. It would be useful to visit not only the already well developed sites, but also the sites which are being built and face some particular difficulties on the initial stage of their organisation. We could take their experience into our consideration while organising multi-modal transport system in our Republic.

7. The organisation of multi-modal traffic without interference from any other parties. Conditions and terms of transportation between the countries.

8. The visits were very much pleasant. Everything we saw was positive.

9. In order to amplify the knowledge about multi-modal sites and to study the matters of an economic character, it would be interesting to visit countries such as Spain and Greece, closer to us.

10. Three pages of suggestions have been given to M. Caceres..

Mr I. SADIKHOV, Head of the Transport Department within the Ministry of Economy of Azerbaidjan.

GEORGIA *(* Mr.A.Zibzibadze)

1. Yes, I do. At present the transportation of cargo by railway is one of few export possibilities of Georgia, and multi-modal transport meet the requirements of Georgia.

2. There is an interest to get to know in details the experience of French Railways. It would have been better to visit SNCF in order to be acquainted with the work of this field.

3. At present stage, the established contacts are not of the business character. In order to establish permanent business contacts in future, it is necessary to identify the needs and demands of Georgia on the basis of examination of the concrete offers of some companies. During the visit to CALBERSON, the discussion dealt with the possibility of the establishment real contacts.

4. Everything was done at the highest level.

5. Yes, it is possible. However, border crossing problems and legal issues should be solved.

6. The sites of the CEI, because they are equipped in the same way as the terminals in Georgia and function under the same conditions of developing market economy.

7. Most of all I liked the visit to CALBERSON, because during that visit the discussion dealt with the possibility of the establishment of real contacts.

8. The negative sides of multimodal systems, if there are any, were not shown.

9. It is necessary to widen the study of the experience of the concrete companies and organise the training of the Georgian specialists.

10. No answer

GEORGIA *(* Mr. T.Gorshkov)

1. Yes but it is necessary to define the aims and range them in accordance with the objectives in question .

2. The technical process and working procedures have been detected as an essential question. The Georgian delegation request training assistance through on-the-job training courses in the field of legal aspects; transport documentation procedures and working procedures in order to create a company in Georgia.

3. The programme did not give the possibilities to establish the concrete, business contacts, though they were desirable.

4. In germany: Satisfactory. In France: Satisfactory

5. Feasible and indispensable.

6. Can not answer this question because first of all it is necessary to determine the needs of our own country as well as the ways of solution of multi-modal transport problems

7. The organisation and the level of the meetings.

8. Important matters have been treated superficially.

9. To study the companies' activities from the lowest up to the highest level.

10. No answer

Mr. Gorshkov, National Transport Council

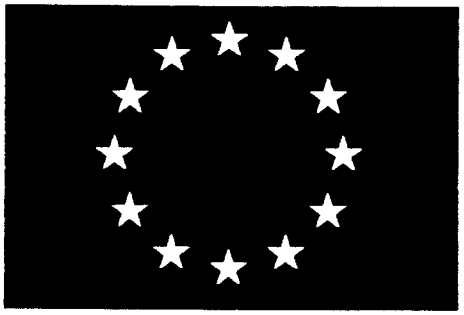
ARMENIA

1. Yes, I do. For the development of our economy, it is necessary to have an advanced system of freight traffic.
2. During our tour study we have received relevant information.
3. We have managed to develop direct contacts with the management of leading European companies such as INTERCONTAINER and NOVOTRANS.
4. In Germany: Positive opinion. In France: Positive opinion
5. The implementation of a multi-modal chain is not only possible, it is absolutely essential. Certain political problems can arise and some obstacles must be overcame by joining forces.
6. (6)There are a lot of multi-modal svstems in Italy which worth to be studied.
7. The organisation of a working process in NOVOTRANS.
8. I am not satisfied with the social and cultural programme of the group. It would have been better to organise the cultural programme during the weekends.
9. It is better to reduce the number of participants in order to organise the programme in a more compact way.
10. It is necessary to co-ordinate the time schedule of the programme, the arrival and the departure time with the participants beforehand. Furthrmore, it is not correct to change the programme of the tour study during its preparation period.

ANNEX 8: PROGRAMME OF THE WORKSHOP AND LIST OF PARTICIPANTS

EUROPEAN UNION

TACIS-TRACECA Programme



WORKSHOP ON

Multimodal Transports : The logical choice for Central Asia and Caucasia

Tashkent 15-17 January 1996

Worshop organized by the Consortium

BCEOM
SOCIETE FRANÇAISE D'INGENIERIE

SYSTRA

DE-Consult

MULTIMODAL TRANSPORT: The logical Choice for Central Asia and Caucasia

1. The Context of the Workshop

The expansion of trade between Europe and Central Asia and Caucasia is seriously being affected by the low cost-effectiveness of existing transport systems. Given the land-locked position of several TRACECA countries and their remoteness from European markets, current mono-modal approaches fail to meet important customer's needs: low cost, high quality (quickness, short delays, etc.).

The dominant alternative, " pure " rail transport, is not qualified to provide good quality " home to home " transport services (short delivery time, reliability, safety, etc.). " Pure " road transports over distances up to 10.000 kilometres are not economically justified. As for the use of the existing TRACECA corridor, the shortest link to Europe, this alternative is seriously handicapped by the partial approach used by the operators involved (rail, road and maritime). The lack of collaboration between the operators does not encourage customers and forwarders to use this corridor. Eventually, there is a clear transport problem that calls for an upgraded transport system.

In this context, the use of containers within a " single multimodal chain " through the TRACECA corridor must be seen as the logical transport choice for Central Asia and Caucasia. Far from being a sum of different transport modes, the combined transport proposed strategy represents a comprehensive solution which must integrate various competitive factors:

- efficient collect and delivery of goods by road transport from rail terminals,
- reliable rail traction from terminal to terminal,
- flexible organisation and high performance of the existing rail terminal networks,
- transport organised throughout the journey, making it possible to offer attractive transport freight rates and simplified transport and transit procedures,

The strategy is based on the notion of " integrated offer " organised under the responsibility of one unique " multimodal organiser " acting as a freight transport " wholesaler " for the benefit of all current participants (railways, road hauliers, forwarding agents, customers, etc.). The system combines the various partners' skills and tools (railways, road hauliers and freight forwarders, large international trading and industrial firms, etc.). The " organiser " company should be set up to create a favourable background for negotiation and a relationship of trust between the various organisations involved in multimodal transport.

From the customers point of view, the proposed multimodal organisation offers "door-to-door " solutions in the most economical form, and represents the appropriate answer to the problem of returning empty containers. From the operators point of view, multimodal transport offers solutions to road carriers (alternatives to 'pure' road transport in the long-distance market), and provides freight traffic to railways' companies. For the country, the use of containers leads to the modernisation of the transport system and will benefit all the other exporting sectors of the economy. It should facilitate the economic integration to the trade world market: the container is a systematic vector for import/exports goods (70% of international trade).

2. Objectives of the Workshop

- **Present** the main findings of the " Forwarding - Multimodal Transport " TRACECA project and explain the general strategy proposed by the team of experts.
- **Explain**, through " case studies ", practical solutions to the transport problems posed by export/imports operations with containers,
- **Define**, at different levels of responsibility, relevant " combined transport projects " that could be financed by International organisations and follow-up actions

3. Participants

The objective of the workshop is to bring together relevant organisations from different countries, from different transport modes at one same table to discuss the Multimodal Transport Strategy proposed by the European team. Participants to the workshop should include:

- Decision makers from Ministries of Transport (or equivalent where there is not such a Ministry),
- Executive from providers of International transport services (railways, road hauliers, freight forwarders, shipping lines) from the eight TRACECA countries,
- Others' professionals concerned with container transport issues such as consultants or combined transport equipment providers (containers, road chassis, handling equipment, etc.).

4. Workshop Program

January 15, 1997

First Session: Suitable Organisation for Multimodal Transport.

11:00 Results and strategy from the present Multimodal project in connection with East-West international routes.

If the « multimodal chain » is the most suitable and logical transport choice for Central Asian and Caucasian countries, the development of this particular traffic is facing several constraints (organisation, technologies, etc.;) which should be overcome by implementing appropriated short term and medium term « step by step » multimodal strategies. **José Caceres, Team Leader**

12.00. Intermodal planning taking account of traffic flows

The current container traffic on the TRACECA route is still quite low. In spite a high potential for containerisation, recent trends are rather negative. This situation is calling for major reorganisation of logistics schemes, in favour of containerisation, to facilitate the integration of the TRACECA transport systems to the new international trade context and perspectives. **Paul Pezant, Planning Expert.**

14.00. Setting up a TRACECA Multimodal Organisation.

If combined transport appear to be an most interesting solution for Central Asia, the combination of various transport modes in a single transport chain requires an appropriated organisational frame of work: combined transport structures are cruelly lacking. They must be created not without a favourable background for negotiation and relationship of trust between the various partners.

- ⇒ *A suitable organisation for TRACECA countries: the legal structures of the different modes presents fundamental differences and the mono-modal partners have different interest. This is an obstacle to group on a single structure the responsibility of the overall international transport by container, including the customs procedures. A combination of different partners transport skills and tools, through an appropriated organisation, is absolutely required.*
- ⇒ *Basic principle and role of the different partners involved (the State, freight generators, road operators, railways, freight forwarders, etc.).*
- ⇒ *Organisation of the proposed structure: who provides the network, the rolling stock; staff, wagons, containers, road chassis, etc.) and structure: status, capital structure, organisation chart, contracts between partners.*
- ⇒ *Working procedures and activities of the proposed Multimodal organisation:*

Claude Durand, Management Expert.

14.00. Container transport movements from Central Asia: The case of Uzbekistan

Firms established in Uzbekistan are experiencing particular transport problems due to the insufficient adaptation of the Uzbek international transport system to the use of containers. The return of unloaded containers is posing a serious problem to the transport department of these firms and calls for specific answers. The problem of returning empty containers could be solved by implementing an specific strategy:

- ⇒ *launching an «Uzbek Container Transport Group of Economic Interest »*
- ⇒ *conducting market surveys next to potential customers: freight forwarders and shippers in Europe as well as in Uzbekistan*
- ⇒ *setting up an « Operational Plan »: how a multimodal traffic must be set up*

Marc Landrin, Operation Expert

16.00. Uzbek Cotton Movement Project: Preliminary results from the project implementation

Two parallel market research programmes have been designed and implemented to provide a comprehensive picture of the cotton market and the potential to use the corridor. A Transport Commission has been formed in Uzbekistan to facilitate the development of cotton shipment along the TRACECA route. Results from the study.

Les Cheesman, Field Manager (Scott Wilson Kirkpatrick / BCEOM)

January 16, 1997

Second Session: Setting up specialised container trains integrated within a single Multimodal chain along the TRACECA corridor

9.15 The « Trans-Caucasian Container Pilot Train »

The « TRACECA container Pilot train Poti - Tbilissi - Baku (Ferry Port):» have been recently implemented. Description of the project and presentation of results.

Wolfgang Kranz. Team leader of the TRACECA project.

11.15 Setting up « specialised container along the overall TRACECA corridor

In spite of the poor condition of the terminals, there is no major technical impediment to deal with the traffic of 20' containers. However, In the long run a big proportion of the old cranes should be replaced. These improvements should be concentrated on a very reduced number of terminal locations: Baku, Tashkent[1], Almaty and may be Tbilissi, Ashgabat, Bukhara or Samarkand as well as the Fergana valley or Akmola/both aside of the main corridor:

- ⇒ *Poti Sea Terminal - Tbilissi - Baku (Khyrdalan and/or Baku Sea Port),*
- ⇒ *Turkmenbashi (Port) - Ashgabat (Obesberdyev-Kulijevo),*
- ⇒ *Bukhara - Tashkent*
- ⇒ *Tashkent (Shumilovo) - Almaty - Druzhba*
- ⇒ *Standards for physical handling and transport., specially in the area of ISO container handling and new transport techniques*
- ⇒ *Required short term investments to upgrade the existing terminal network and expected benefits according to different traffic scenarios (low, medium, high).*

[1] already done taking into consideration the well developed state of the Shoshtrans-Terminal in Tashkent-Shumilovo

Definition of additional points for side streams:

- ⇒ *Yerevan (separation in Tbilissi)*
  one terminal in the Fergana valley (separation in Bukhara, Samarkand or Shumilovo)
- ⇒ *Bishkek (separation in Lugovaya)*
- ⇒ *additional terminal in the Tchu/Dzhambul area*
- ⇒ *Sarakhs (separation in Ashgabat or Tedzhen/Mary)*
- ⇒ *Central Kazakhstan (separation in Lugovaya or Berlik)*
- ⇒ *Required short term investments to upgrade the existing terminal network and expected benefits according to different traffic scenarios (low, medium, high*
- ⇒ *Costs and benefits of the proposed strategy (advantages of the system as compared with he current practices)*

Frank Prescha: Multimodal Rail and Operations Expert

12. 15 *Discussion*
12.30 *Lunch*

Third Session: The maritime facet of the TRACECA corridor

14.15 Maritime Containers in Combined traffic along the TRACECA corridor

An appropriate combined transport strategy must emphasise the interaction between the various links in the multi-modal chain. In this respect the interaction with the maritime transport is of particular importance:

- ⇒ *Reorganisation of the Port of Poti (organisation, technical actions, strategies to follow according to different traffic scenarios).*
- ⇒ *Integration of the Port of Turkmenbaschi and Aktau: reorganisation of the general cargo terminal, the ferry terminal*
- ⇒ *Integration of the Port of Baku (organisation, technical actions, strategies to follow according to different traffic scenarios).*
- ⇒ *Economic evaluation of the feasibility of the contemplated improvements.*

Bernard Francou: Port and Shipping Multimodal Transport Expert.

15.30 *Discussion*

Fourth Session: Container Tariff System for Container Traffics

16.30 The Railway Tariff Policy Related to Container Traffic

Reorganisation of the railway tariff policy applied to railway multi-modal transportation:

- ⇒ *differentiation of container railway tariffs from MTT tariffs,*
- ⇒ *creation of a specific tariff for International Transportation Units (UTI),*
- ⇒ *design door to door or terminal to terminal tariffs and possible home to home without any additional duty,*
- ⇒ *expression of all tariffs in a single currency,*
- ⇒ *introduction of reduced tariffs encouraging productivity gains (quantity, round trip tickets to facility re-loading, possible empty runs, etc.),*
- ⇒ *plan payment terms and conditions for customers, compatible with national currency exchange legislation,*
- ⇒ *setting up new tariffs by taking into account transportation network costs and market tariffs (competitors using other modes or other routes competing with TRACECA).*

Claude Durand, Management Expert.

17.30 *Discussion*

January 17, 1997

Fifth Session: Round Table: Discussions on Conclusions and follow up actions

The development of multimodal transport in TRACECA countries is hampered by several factors: insufficient knowledge of modern multimodal techniques, lack of financial resources and weak links with operators in industrial countries. Ways to remove these constraints should be identified.

Outside inputs can take different forms:

- *technical assistance/training*
- *financing*
- *joint ventures with European operators*

To be subject for further financing the proposal must comply with specific conditions: clear definition of objectives, identification of partners involved, estimation of required resources, estimation of expected benefits,

- Introduction on conditions and mechanisms for project financing. ***Mike Sims. TRACECA Management and Co-ordination.***

- Summary of the Workshop presentations: ***José Caceres,, Team Leader,***

- Evaluation of the seminar presentations and recent experiences : ***TRACECA counterparts.***
Representatives from each country are invited to presents their conclusions on the various projects and case studies presented during and propose follow up actions.

13.00 General Conclusions. José Caceres.

18. 00 Special dinner

CASE STUDIES AND TRAINING

List of participants to the Tashkent Workshop
January 15-17, 1997

ARMENIA :

Henrich OZNECIAN, Head of the Freight Transport and Commercial Department within the Armenian Railways,
Manuk KAZARIAN. Chief Engineer within the Ministry of Transports. ARMENIA.

KAZAKHSTAN

Mr Kanat MOUKHAMEDJANOV, Deputy Minister of Transports.
Mr. Anatoliy ZAVYALOV, General Manager of « KAZAVTOTRANS »
Mr Anuarbek SABIETOV, General Manager of « Silk Road Express Limited »,
Mrs Raikhara SABETOVA, Deputy Head of « Kazinterfreight » Transport Forwarders.
Mr. Vladimir UTEBEKOV, General Manager of ISKOMTRANS (Research Institute for Transport Sector Complex Problems),
Mr Jakhoncha AKHMIETOV, Director of « Tursib » International Transports.
Mr Suguirali SARBAIEV, Head of the « Transport and traffic ». Academy of Transport of Kazakhsatan.

AZERBAIDJAN

M Sultan KIAZIMOV, Chief Engineer within the of the Port of Baku.

UZBEKISTAN

Mr Nemat RADJABOV, Head of the Freight Transport and Commercial Department within the Uzbekistan Railways,
Mr Navruz ERKINOV, Deputy Head of the Railways International Relations Department,
Mr Vladimir ONKIS, Head of the Railways and Sea Transport Department within the Ministry of Foreign Economic Relations of Uzbekistan.
Mr. Murat Khalisov ADILOVICH. Deputy Manager of « Shosh-Trans », Multimodal Operator and Chief of the Tashkent Container Terminal.
Mr. Gulyamov NURITDINOVICH. Deputy Manager of « UZAVTOTRANS Corporation».
Mr Igor MINOCIAN, Deputy Chief of the Tashkent Container Terminal (« Shosh-Trans »),
Mr Ravchan UZMANOV, Deputy head of the of the Transport Department
« UZBEKGELDOR EXPEDITZIA » (Ministry of Foreign Economic Relations)
Mr R; BAIKONOVA, expert from the Uzbek Transport Bureau « KEZ ».

TADJIKISTAN

Mr Khudaieberdieb ABDUPAKHAMONOVICTH, Head of International Transports within the Tadjikistan Railways,
Mr A. AMARBEKOV, Head of International Transports within the Ministry of Road Transport,
Bakhrom CHODIEV, Chief Engineer of Tadjik Railways.

GEORGIE

Mr Alexandre TCHEIDZE, « Director of the National Institute for Transport Problems » and Head of the « Georgian International Carriers Union ».
Tengiz TODUA, Chief Engineer of Operation Department within the Georgian Railways,
Mr Vladimir CHELIA, Head of Intermodal Coordination Department within the Georgian Ministry of Transports.

KYRGHYSTAN

Mr Zubov IVANOVICTH, Head of the Freight Transport and Commercial Department within the Kirghyzs Railways,
Mr Almazbiev IRSALIEV, Head of International Transports within
« KHIGHYZINTRANS »

TURMENISTAN

Mr MAMEDOV, First Deputy of the International Transport Services within the Turmenistan Railways,
Mr Badamov KHYDAIBERDIEV, Chief Engineer of Turmenian Shipping Company.

TRACECA

Mr Mike SIMS, TRACECA Regional Coordinator
Mr Akmal KHAMALOV, TRACECA Coordinator for Uzbekistan
Mrs R DABABAIEVA, TACIS,
Mr Jose CACERES, Team Leader of Multimodal Transport TRACECA Project,
Mr Marc LANDRIN, Multimodal Road Transport expert
Mr Claude DURAND, Multimodal Management expert,
Mr Paul PEZANT, Planning and Traffic expert,
Mr Frank PRESCHA, Multimodal Rail and Technologies expert,
Mr Bernard FRANCOU, Multimodal port and Maritime operations expert,
Mr Lee CHEESMAN, Expert within the « Uzbek Cotton Movement » TRACECA Project,
Mr Wolfgang KRANZ, Expert within the TRACECA project « TRANS-CACAUSIAN CONTAINER TRAIN »

ANNEX 9: UZBEK COTTON MOVEMENT INCEPTION STUDY

1. Introduction and Background

Partner States from Central Asia and the Caucasus region have asked the TRACECA programme management to provide specific technical assistance related, among other issues, to the shipment of cotton through the TRACECA corridor.

During a meeting organised in Brussels on 25 March, the management of the TRACECA project asked project managers to incorporate active assistance to the shipment along the TRACECA route of cotton from Uzbekistan. In the case of the Multi-modal Transport project, this is to be examined firstly within the scope of the case studies foreseen within the third phase of the present project.

A decision was taken to set up a Shipment Task Force in charge of dealing with this issue. CVs and firm proposals were requested and asked to be sent to M. Stroobants.

To approach this issue, the team of experts of the Multimodal Transport project conducted a specific survey in Uzbekistan during May and June to analyse the existing problems and prepare a proposal to assist the Uzbeks entities involved in the cotton shipments along the TRACECA route.

This Study Inception Report presents the results of such investigations and proposes concrete solutions to overcome the problems detected, particularly in the field of international transport by container.

The Uzbekistan cotton market

In Uzbekistan, approximately 40 % of the GDP is generated in agriculture, about 50 % in Industry and the rest in mining, construction and services. In agriculture, cotton is the most important crop, accounting for 40 % of gross value of agricultural production. Nearly 40 % of arable land is consecrated to cotton production. With a production of about 3 million tons per year, the country is the third world producer (approximately 20% of the world production). The cotton represents the most important hard currency source (80 % in 1993).

Not having transformation industries, the cotton activity is largely limited to the shelling process. The transformation in cotton linen and cloth material involves only 15 % of cotton.

Traditionally, the cotton has been exported to Russia. In the last few years, the exports, (representing about 50 % of the production) headed primarly for countries outside of the CEI countries. The European Union is by far the most important market for the uzbek cotton. The export to Europe represents 80 % of total exports. Most important customers are in Germany, Italy and France.

The development of the cotton transport and market business will be affected by two main factors: Firstly, by the stabilisation of arable land dedicated to cotton and the development of other source of production. In particular the cultivation of wheat will be promoted to reach a certain level of self-sufficiency. Secondly, by the desire of the Uzbek authorities to exert control on the commercialisation process. To this end, various measures are contemplated. Firstly, it is contemplated to create a large storage centre for cotton in Buchara with a capacity of 50.000 tons. Secondly, the Uzbek authorities will authenticate the quality of the product by guaranting international customers (through registered Uzbeks certification authority) the origin and the quality of the cotton. It is clear that the setting up of such a quality policy should facilitate the international traffic by container.

Operating problems related to the transport of cotton.

During Soviet times, the cotton was generally forwarded to the sorting centre of Ribnoye, near Moscow, and then exported to the Black Sea ports and the Baltic's ports.

At present, most of the cotton is forwarded:

- by train to the Baltic ports warehouses and then commercialised (FOB) from the ports.
- by block-train Tashkent-Europe, via the South of Russia, and with a transhipment in BREST (FOB Russian Border) to Rotterdam. From Rotterdam, the cotton is fowarded to the rest of Europe.

Recent developments make use of the Trans-Caspian corridor, the shortest link to Europe, an interesting alternative for Central Asia. As part of the Regional Agreement on Transport Issues , the Government of Uzbekistan have decided to ship part of the cotton exports to Europe through the TRACECA corridor: 10 000 tons in 1996, 30.000 tons in 1997 and 100.000 by the year 2000.

A recent shipment of cotton from Uzbekistan to Poti through the TRACECA corridor has been carried out by the firm " OUZKHLOPROMSBYT " as part of a 4000 ton cotton shipment from Uzbekistan to Brazil. The operation has been a success and shows that there are no major technological obstacles (infrastructure and vehicle fleet) for the shipment of cotton from Uzbekistan to Poti. Whilst the main railway infrastructure and rolling stock are not always in good state and not always in line with Europeans standards, they are however able to allow transport operations through the corridor.

However, the question of retrieving the wagons to Uzbekistan and the transfer of responsibility for the shipment seems to be unreliable. A monitoring system is required to complement the Regional Transport Agreement.

Operations are also handicapped by the difficulties on obtaining information on tariffs as well as the implementation of international standard procedures: commercial procedures and transport and transit documentation.

Technological problems related to the Transport of cotton

The transport of cotton currently performed largely by open-wagons. It is reported to be difficult to find wagon of good quality. In order to prevent cotton shipments from fire, the wagons must be hermetically closed which requires the doors or any other defective place of the wagon to be covered with kraft paper secured with a special glue. This operation is reported to be expensive, partly because the raw material used for this is imported from Russia.

The handling technologies used at most of the cotton factories have been designed to load the cotton in rail open-wagons. This explains the little use made of containers for the cotton transport operations. But the management of major factories visited during the survey (YANGUI-YOUL, more than 50 % of the cotton exported to Europe; and TCHINAZ, able to use 20" or 40" container), said they are in favour of the use of containers and are prepared to implement the necessary measures to enable it.

Important cotton storage facilities exist in the various districts, some of them with a capacity of 50 000 tons (AV ALTINE: storage of cotton from the factories located in the district of SYR-DARYA). Nevertheless, the storage installations are lacking in some important areas of concentration. A project to create a large storage centre in Buchara with a capacity of 50.000 tons, is already contemplated to deal with this important issue. Such storage installations should allow the modern train formation techniques such as a " Block train " from Buchara to Poti to be put into practice.

In conclusion, it seems that for the present traffic level there is no urgent need for investment either in road and rail infrastructure or in vehicle fleet. However, the handling techniques require some improvements to adapt the cotton traffic to the widespread use of containers. Finally, the adoption of standard commercial and transport procedures as well as the monitoring of wagons through the TRACECA corridor must be improved.

Container international transport context.

Foreign firms established in Uzbekistan are experiencing particular transport problems due to the poor adaptation of the Uzbek transport system to the use of containers and swap bodies that are dominant in the world trade market: 70 % of international trade flows are shipped by containers.

The example of the UZ-DAEWOO AUTO, a car assembling factory, illustrates the situation. The imported car parts from Korea are transported by container. The problem posed to the transport department is the return of unloaded containers. Over a period of 12 months, there is a need for the re-loading and the sending back to Korea of about 8 100 TEU (twenty-foot equivalent units). Up to now, most of the containers are sent back empty.

The Uzbek Government is prepared to allow DAEWOO transport department to carry 100 000 tons of cotton fibre in chaff but Korea imports little volumes of Uzbek cotton. DAEWOO is still looking for a solution to this problem. They are now studying the possibility of commercialising the Uzbek cotton in the south-east Asian market, by shipping the containers thorough China (Droujba). No attempts have been made to sent this cotton to Europe.

Yet, the return of containers loaded with Uzbek cotton to Europe, by the TRACECA corridor, and from Europe to Korea with Europeans products could be conceivable. The Uzbek market for cotton is essentially located in Europe. A market from Europe to Korea exits too. Such a relatively complex transport operation requires the renovation of the Uzbek cotton commercialisation channels.

Commercialisation and Transport Organisation.

About 80% of the cotton from some 350 cotton firms are at present commercialised under the responsibility of the Ministry of International Economic Relations. The operations of transport and transit are entrusted to the state transport company " OUZVESHTRANS ". The firm is in a monopoly position. It operates with traditional methods and does not seem able to offer the most attractive rates and high quality of service adapted to the multi-modal transport of cotton to Europe. As the cotton is sold « ex-works » or in the best cases « FOB », the uzbeks can not, at present, guarantee (at 100%) to the final customer the uzbek origin of the cotton. Furthermore, they can not keep logistics and transport costs under control. This may handicap the competitiveness and the commercialistaion of the product.

The arrival on the market of some new transport firms, created under the form of Joint Venture should allow the opening of the transport market to open competition. One of these new firms is specialised in international transport by container. The limited company, SHOSH-TRANS, is a forwarding company. It has its own container terminal at the Chomilovo-Tachkent, equipped with modern handling systems for 20" and 40" containers and its own road chassis for the transport of containers(about 100 units). Shosh-Trans is studying the possibility of opening a second container terminal at Buchara.

The aim of SHOSH-TRANS is to increase the competitiveness of transport by container. This is to be achieved by designing and implementing new transport and logistics schemes that allow pendular traffic: reduce the rate of shipment with empty container and decrease the immobilisation time.

At present, only 10 % of the containers used for import operations are used for shipment with exported goods. The short term objective of the company is to increase this rate to 50 % by using the cotton to fill the containers exported. To this end, they are carrying out some trials with two cotton firms.

It is thus conceivable that by combining the uzbeks' transport skills, the use of containers could be increased. This calls for mutual agreements between the various parties (containers' main users, cotton firms, transport forwarders, railways' company, etc.). In principle, such agreements would be beneficial for all the partners involved in the international trade. By working together, It should be possible to facilitate the establishment of pendular container traffic.

For the Uzbek economy, the creation of pendular traffics and the possibility of controlling the commercialisation circuit (the cotton could be sold « CIF » instead of « FOB » or « Ex-works ») is perfectly in line with the authorities objectives. The resulting modernisation of the transport system could also help all the other exporting sectors of the economy.

However, the implementation of such an option calls for a renovated transport organisation. The creation of a competent independent body is required. A « National Transport Commission » composed by members from all the partners involved in the international trade) is proposed to help the Uzbeks reach their goals. The TACIS programme should provide the required technical assistance to deal with this issue.

2. Objectives of the assistance required

The wider objective is to set up a local organisation able to efficiently respond to the specific shipper's transport demands. It is a question of facilitating the existence of pendular container traffic to keep transport costs at more competitive levels. This calls for a new organisation of combined transport in Uzbekistan. The organisation should be composed by representatives of different sectors involved in the international trade: the State, the Users and the Transport Operators (road, railways and multimodal).

It is proposed to create a "National Transport Commission " (or Shipment Task Force) composed by one representative from:

- OUZVESHTRANS
- UZBEK Railways
- OUZKHLOKOPROMSBYT
- MINISTRY OF ECONOMIC RELATIONS
- SHOSH-TRANS
- TACIS experts (two European experts).

The commission should produce within two months (September -October) a report containing the directions and actions to allow the first shipment of cotton to take place during the last month of 1996.

3. Description of the work

The work should comprise three steps:

- small market survey in Europe
- operational plan
- monitoring of first results

The work should start by a market study to sound out the opinion of the European customers concerning the modification of the commercialisation methods to a large use of containers through the TRACECA corridor. This one-month study should be carried out in Europe in September.

The second step consists of operational mission in Tashkent by two European experts for two months. They should actively participate in the writing of a business plan that clearly specifies how the Commission should be involved in the following problems:

- organisation of the shipment from and to Terminals (elaboration of a Transport Plan)
- definition of the conditions under which the railways make the transport rolling available
- monitoring of the wagons sent to Poti.
- organise the administrative aspects and transport documents
    * International transport contracts specific to multi-modal operations
    * possibility of editing documents such as TBL-FIATA to facilitate international payments
- negotiate the tariff with the international railways (tariff, availability of transport means, choice of routes, documentation..).
- negotiate the conditions under which the empty containers generated by imports flows can be used by uzbeks exporters. This requires to:
    * Inventory the fleet of empty containers in Uzkekistan,
    * find an agreement with DAEWOO and other main container users
    * inventory the fleet of empty containers in Kirghistan, Kazakhstan and Tadjikistan.
    * find a suitable financial agreement with the Kazakhs and Kirghys to make use of empty containers
- establish co-operation agreements with the owners of containers such as SEALAND
- establish an specification book for the loading of containers and the certification of goods
- organise the transfer of responsibility along the entire logistic chain
- Assign a responsible officer for:
    * negotiations with the European railways administrations
    * organisation of the operations in all the transit and destination countries
    * locating Uzbeks transport correspondents
- Establish commercial agreement with European shippers exporting to Uzbekistan in order to encourage them to accept the return of this container to Europe loaded with cotton.

In the report to be produced, the commission should clearly indicate the Uzbek operator who will be in charge of setting up the traffic.

The Multi-modal Transport project Operating expert should have to:

- participate in the launching of the Commission in order to define in detail the goals of the mission
- to validate the decisions stated in the Final Report.

The third and final step would consist in monitoring the first shipments to validate the actions decided in the previous phase.

4. Contacts made with Partners and organisations

The activities to be developed involves partners from the State; from the transport sector and from the industrial sector.

Preliminary contacts have been already established with the following persons and organisations:

UZBEK Railways: **Activity:** Main traction of container and wagons along the TRACECA corridor.	M. DAVIDOVITH, Responsible for Container Division within the railways.
OUZKHLOKOPROMSBYT **Activity:** Organism responsible for the Distribution next to the Cotton Industry	DYATCHKOV. V. Vladimirovith. Vice President. PHAROUKH Arkramov, Director of Logistic International Relations
MINISTRY OF ECONOMIC RELATIONS	
OUZVESHTRANS: **Activity:** Transport and transit operator for cotton	M. GANIEV Elyor, First Vice Minister M. GANIEV is directly concerned by the activity of the OUZVESHTRANS
SHOSH-TRANS; **Activity:** Forwarder; Carrier specialised in container traffic (Limited company: Transrail/ Uzbek Railways/ Transbusines Express (MPS and Sealand)	M. CHADMANOV Alexandrovitch, General Director M. KHALISSINOV Murat, Deputy Director
TACIS Programme	As proposed below.

The official members of the Commission should assign the specialists from each organisation responsible for executing the decisions taken and reporting to Commission on results.

Contacts taken next to the representatives of the users:

- UZ- DAEWOO: M. HO-KYON SHIN, Director and the supplier of containers: WOO JIN (activities in Anvers in Europe)
- SERGELI-Autechservis: M. ZUFAROV Sabir, President.

International Operators with activities in Uzbekistan:

- SEA LAND: M. KURBANOV Baktiyar, Sales Manager - Central Asia.
- INTERCONTAINER

5. Composition of the E.U. experts team

The team of experts may be essentially composed by:

One expatriate expert based in Europe to conduct the market survey during September.

Two permanent expatriates experts based in Tashkent for 2 months:

- one operational expert with practical experience in the field of International combined transport
- one expert specialised in the field of container transit and transport documentary procedures

Additional input is also required for the supervision and co-ordination of decisions stated in the Final Report:

- Launching the Transport Commission,
- supervision and validation of decisions stated in the Final Report.

6. Expected output

The experts should produce a Draft Final Report within two months, starting from September. The report must describe the directions and actions to be implemented so as to allow the first shipment of cotton to take place during the last month of 1996.

ANNEX 10: POTENTIAL FOR MULTIMODAL TRANSPORT

CHART A

COMMODITY GROUPS

Group No	Commodities
1	Cattle and products of animal origin; products of vegetal origin
2	Finished food-stuffs; fat and oil of animal or vegetable origin
3	Mineral products; products of chemical industry or related industries; wares from stone, gypsum, cement
4	Non-precious metal
5	Machinery, equipment; road, air and water transport equipment
6	Plastics, rubber and rubber wares; leather, fur and their wares; wood, paper, textile, shoes; appliances, arms and ammunition; various manufactured goods; art products

CHART B

COUNTRY GROUPS

No	Name	Countries
1	Caucasian Region	Armenia, Azerbaidjan, Georgia
2	Mid-Asian Region	Kyrgyzstan, Tadjikistan, Turkmenistan, Uzbekistan
3	Kazakstan	Kazakstan
4	Other CIS	Russian Federation, Ukraine, Belorussia, Moldova
5	Northern Europe	Baltic states, Finland, Sweden, Poland, Czechia
6	Central + Western Europe	Romania, Hungary, Austria, Slovakia, Switzerland, France, Germany, Benelux, Denmark, UK, Ireland
7	Southern Europe	Italy, Greece, Spain, Portugal, Former Yugoslavia, Bulgaria, Albania, Cyprus
8	East Mediterra-nea, Africa	Israel, Egypt, Irak, Syria, Lebanon, Jordan, African countries
9	Turkey, Iran Persian Gulf	Turkey, Iran, UAE, Oman, Kuwait, Saudi Arabia, Qatar
10	South Asia	Afghanistan, India, Pakistan, Sri Lanka, Bangladesh, ASEAN countries, Myanmar, Cambodia, PNG
11	China	China, Laos, Mongolia
12	Far-East Asia	Japan, Taiwan, South Korea, North Korea
13	America - West	West USA, Australia, Colombia,Peru,Chile,Ecuador
14	America - East	East USA, Caribbean states, Mexico, Venezuela, Brazil, Uruguay, Argentina, Paraguay, Bolivia

Table 1a

Export

Country group	Group of commodities						
	1	2	3	4	5	6	Total
1	2 978	11 352	565 514	16 312	1 501	4 273	601 930
2	12 552	1 884	57 118	1 221	4 779	5 030	82 584
3	1 244	1 826	40 237	994	2 738	940	47 980
4	22 832	82 204	329 952	53 168	26 789	19 808	534 753
5	1 038	2 294	63 565	44	14	1 758	68 713
6	1 394	5 729	186 539	9 122	532	71 014	274 330
7	463	547	481 594	2 394	740	354	486 093
8	78	336	57	485	82	254	1 293
9	5 345	12 450	1 127 964	168 020	42 196	59 295	1 415 270
10	92	3	0	2	208	11 959	12 265
11	1 079	0	0	0	0	1 210	2 288
12	1 000	41	0	0	0	563	1 604
13	0	0	0	0	233	0	233
14	27	59	21	187	1	9 773	10 069
Total	50 122	118 729	2 852 565	251 955	79 818	186 237	3 539 426

1 Caucasian Region
2 Mid-Asian Region
3 Kazakhstan
4 Other CIS
5 Northern Europe
6 Central - West Europe
7 South Europe
8 East Mediter.-Africa
9 Turkey-Iran-Persian G.
10 South Asia
11 China
12 Far-East Asia
13 America - West
14 America - East

Import

Country group	Group of commodities						
	1	2	3	4	5	6	Total
1	16 542	3 475	716 200	33 662	952	11 276	782 107
2	1 402	301	214 172	202	1 109	4 167	221 354
3	45 482	18	72 326	12 099	414	741	131 080
4	125 922	73 081	215 357	114 661	16 351	39 824	585 196
5	12 212	3 823	2 433	553	646	660	20 328
6	445 062	60 655	215 160	7 636	2 896	8 251	739 661
7	202 091	24 875	221 133	2 278	435	1 685	452 496
8	3 406	1 970	40 167	293	176	481	46 491
9	349 336	306 833	155 732	5 725	8 037	35 615	861 278
10	41 634	111	7 657	185	4	1 246	50 838
11	35	135	83	399	292	565	1 508
12	0	17	5 842	526	245	149	6 779
13	67	0	2	0	108	13	191
14	203 606	12 727	14 367	8 562	480	1 319	241 061
Total	1 446 799	488 022	1 880 633	186 786	32 151	105 999	4 140 391

1 Caucasian Region
2 Mid-Asian Region
3 Kazakhstan
4 Other CIS
5 Northern Europe
6 Central - West Europe
7 South Europe
8 East Mediter.-Africa
9 Turkey-Iran-Persian G.
10 South Asia
11 China
12 Far-East Asia
13 America - West
14 America - East

1 Agri Prod Livestock
2 Foodstuff
3 Mineral pr. Chemicals
4 Metal
5 Equipme Vehicles
6 Textile-Ma-nuf.goods

Export

Country group	Group of commodities							
	1	2	3	4	5	6	Total	
1	1 207	683	330 493	1 077	199	2 188	335 846	Caucasian Region
2	41 472	16 223	1 789 187	40 983	24 418	20 909	1 933 193	Mid-Asian Region
3	57 272	33 851	693 414	15 353	9 260	9 456	818 607	Kazakhstan
4	694 114	147 963	525 252	77 616	64 790	215 220	1 724 955	Other CIS
5	1 700	28 305	85 013	28 139	379	61 883	205 419	Northern Europe
6	1 377	12 216	887 966	235 267	188	594 431	1 731 446	Central - West Europe
7	20	18	336 962	49 368	205	60 916	447 489	South Europe
8	62	0	16 690	471	563	601	18 388	East Mediter.-Africa
9	1 278	280	420 331	81 737	2 642	139 815	646 083	Turkey-Iran-Persian G.
10	1 121	1 162	158 075	34 706	237	76 517	271 818	South Asia
11	5 659	591	377 453	56 763	12 026	69 982	522 474	China
12	365	25	9	8 572	5	157 872	166 849	Far-East Asia
13	26	0	0	0	0	115	142	America - West
14	3 179	0	60 221	331	7	193 979	257 717	America - East
Total	808 853	241 321	5 681 069	630 387	114 925	1 603 891	9 080 447	

Import

Country group	Group of commodities							
	1	2	3	4	5	6	Total	
1	4 981	121 386	210 475	3 418	8 010	12 930	361 201	Caucasian Region
2	56 229	73 197	2 434 920	39 433	8 331	20 042	2 632 151	Mid-Asian Region
3	1 048 846	25 248	2 371 704	91 335	17 483	46 584	3 601 200	Kazakhstan
4	502 123	260 507	974 810	637 530	97 172	713 994	3 186 136	Other CIS
5	329 761	150 940	42 480	9 404	6 118	43 806	582 508	Northern Europe
6	1 240 355	174 206	66 074	14 746	12 810	29 504	1 537 696	Central - West Europe
7	31 304	11 791	37 121	12 290	2 016	6 163	100 685	South Europe
8	12 922	3 993	4 010	1 693	47	6 178	28 843	East Mediter.-Africa
9	86 466	200 266	91 974	10 490	15 631	78 257	483 085	Turkey-Iran-Persian G.
10	11 473	18 838	12 772	1 752	1 245	8 234	54 314	South Asia
11	9 241	4 518	39 402	1 374	4 170	8 174	66 879	China
12	18	2 718	1 707	22 447	19 389	8 823	55 103	Far-East Asia
13	233	187	0	0	0	1	420	America - West
14	148 420	110 087	54 307	3 249	3 119	10 587	329 769	America - East
Total	3 482 374	1 157 884	6 341 760	849 165	195 546	993 282	13 020 012	

1 Agri Prod Livestock
2 Foodstuff
3 Mineral pr. Chemicals
4 Metal
5 Equipme Vehicles
6 Textile-Ma-nuf.goods

Table 1c

Export

Country group	Group of commodities							
	1	2	3	4	5	6	Total	
1	60 347	34	44 102	37 114	314	502	142 413	Caucasian Region
2	862 535	19 339	2 381 443	102 647	20 017	19 089	3 405 070	Mid-Asian Region
3	0	0	0	0	0	0	0	Kazakhstan
4	2 515 847	168 094	19 996 346	4 114 957	229 386	82 878	27 107 507	Other CIS
5	179 161	2 259	140 684	428 580	1 820	3 088	755 592	Northern Europe
6	16 624	2 516	1 688 383	482 629	606	10 068	2 200 826	Central - West Europe
7	615	47	54 564	88 417	531	5 192	149 365	South Europe
8	949	0	2 476	16 882	8	84	20 400	East Mediter.-Africa
9	4 292	157	60 662	240 081	178	18 636	324 004	Turkey-Iran-Persian G.
10	18 155	244	21 899	288 020	24	2 536	330 878	South Asia
11	62 828	538	356 391	436 676	53 178	97 842	1 007 452	China
12	348	0	38 720	166 636	8	1 336	207 047	Far-East Asia
13	69	0	0	2 497	0	15	2 580	America - West
14	927	333	43 113	143 532	225	1 612	189 743	America - East
Total	3 722 697	193 563	24 828 785	6 548 671	306 300	242 883	35 842 899	

Import

Country group	Group of commodities							
	1	2	3	4	5	6	Total	
1	1 604	1 238	58 570	1 702	3 017	66 197	132 328	Caucasian Region
2	52 917	15 406	836 520	16 134	7 094	928 094	1 856 164	Mid-Asian Region
3	0	0	0	0	0	15	15	Kazakhstan
4	28 945	371 353	4 777 771	1 207 762	201 836	6 587 720	13 175 388	Other CIS
5	5 016	18 154	61 855	3 496	6 342	94 937	189 800	Northern Europe
6	9 428	113 209	98 558	3 537	28 996	253 837	507 566	Central - West Europe
7	1 300	8 678	6 387	463	1 525	18 388	36 741	South Europe
8	1 675	3 651	1 010	23	154	6 636	13 148	East Mediter.-Africa
9	11 402	32 343	19 861	2 822	6 171	72 664	145 263	Turkey-Iran-Persian G.
10	5 146	1 179	1 333	1 070	667	9 469	18 864	South Asia
11	1 470	17 332	128 074	2 669	2 734	152 308	304 587	China
12	35	533	224	243	4 552	5 630	11 217	Far-East Asia
13	5	18	37 258	2 400	217	39 944	79 841	America - West
14	2 204	5 647	2 089	260	1 229	11 475	22 904	America - East
Total	121 147	588 743	6 029 510	1 242 586	264 540	8 247 320	16 493 846	

1	2	3	4	5	6
Agri Prod Livestock	Foodstuff	Mineral pr. Chemicals	Metal	Equipme Vehicles	Textile-Ma-nuf.goods

Table 2a

Export - Container traffic share

Country group	Group of commodities					
	1	2	3	4	5	6
1	0%	0%	0%	0%	0%	0%
2	0%	15%	0%	0%	0%	15%
3	0%	30%	0%	0%	0%	30%
4	0%	50%	0%	5%	15%	50%
5	10%	80%	5%	10%	35%	70%
6	10%	80%	5%	10%	35%	75%
7	10%	85%	5%	15%	40%	80%
8	10%	70%	5%	10%	30%	70%
9	0%	40%	0%	5%	10%	40%
10	10%	90%	10%	10%	40%	90%
11	5%	80%	3%	10%	30%	60%
12	10%	50%	5%	15%	40%	90%
13	10%	90%	5%	15%	40%	90%
14	10%	90%	5%	15%	40%	90%

Caucasian Region
Mid-Asian Region
Kazakhstan
Other CIS
Northern Europe
Central - West Europe
South Europe
East Mediter.-Africa
Turkey-Iran-Persian G.
South Asia
China
Far-East Asia
America - West
America - East

Import - Container traffic share

Country group	Group of commodities					
	1	2	3	4	5	6
1	0%	0%	0%	0%	0%	0%
2	0%	15%	0%	0%	0%	15%
3	0%	30%	0%	0%	0%	30%
4	0%	50%	0%	5%	15%	50%
5	10%	80%	5%	10%	35%	70%
6	10%	80%	5%	10%	35%	75%
7	10%	85%	5%	15%	40%	80%
8	10%	70%	5%	10%	30%	70%
9	0%	40%	0%	5%	10%	40%
10	10%	90%	10%	10%	40%	90%
11	5%	80%	3%	10%	30%	60%
12	10%	50%	5%	15%	40%	90%
13	10%	90%	5%	15%	40%	90%
14	10%	90%	5%	15%	40%	90%

Caucasian Region
Mid-Asian Region
Kazakhstan
Other CIS
Northern Europe
Central - West Europe
South Europe
East Mediter.-Africa
Turkey-Iran-Persian G.
South Asia
China
Far-East Asia
America - West
America - East

1	2	3	4	5	6
Agri Prod Livestock	Foodstuff	Mineral pr. Chemicals	Metal	Equipment Vehicles	Textile-Ma-nuf.goods

Table 2b

Export - Container traffic share

Country group	Group of commodities					
	1	2	3	4	5	6
1	0%	0%	0%	0%	0%	0%
2	0%	15%	0%	0%	0%	15%
3	0%	30%	0%	0%	0%	30%
4	0%	50%	0%	5%	15%	50%
5	10%	80%	5%	10%	35%	70%
6	10%	80%	5%	10%	35%	75%
7	10%	85%	5%	15%	40%	80%
8	10%	70%	5%	10%	30%	70%
9	0%	40%	0%	5%	10%	40%
10	10%	90%	10%	10%	40%	90%
11	5%	80%	3%	10%	30%	60%
12	10%	50%	5%	15%	40%	90%
13	10%	90%	5%	15%	40%	90%
14	10%	90%	5%	15%	40%	90%

Caucasian Region
Mid-Asian Region
Kazakhstan
Other CIS
Northern Europe
Central - West Europe
South Europe
East Mediter.-Africa
Turkey-Iran-Persian G.
South Asia
China
Far-East Asia
America - West
America - East

Import - Container traffic share

Country group	Group of commodities					
	1	2	3	4	5	6
1	0%	0%	0%	0%	0%	0%
2	0%	15%	0%	0%	0%	15%
3	0%	30%	0%	0%	0%	30%
4	0%	50%	0%	5%	15%	50%
5	10%	80%	5%	10%	35%	70%
6	10%	80%	5%	10%	35%	75%
7	10%	85%	5%	15%	40%	80%
8	10%	70%	5%	10%	30%	70%
9	0%	40%	0%	5%	10%	40%
10	10%	90%	10%	10%	40%	90%
11	5%	80%	3%	10%	30%	60%
12	10%	50%	5%	15%	40%	90%
13	10%	90%	5%	15%	40%	90%
14	10%	90%	5%	15%	40%	90%

Caucasian Region
Mid-Asian Region
Kazakhstan
Other CIS
Northern Europe
Central - West Europe
South Europe
East Mediter.-Africa
Turkey-Iran-Persian G.
South Asia
China
Far-East Asia
America - West
America - East

1 Agri Prod Livestock
2 Foodstuff
3 Mineral pr. Chemicals
4 Metal
5 Equipment Vehicles
6 Textile-Manuf.goods

Table 2c

Export - Container traffic share

Country group	Group of commodities						
	1	2	3	4	5	6	
1	0%	0%	0%	0%	0%	0%	Caucasian Region
2	0%	15%	0%	0%	0%	15%	Mid-Asian Region
3	0%	30%	0%	0%	0%	30%	Kazakhstan
4	0%	50%	0%	5%	15%	50%	Other CIS
5	10%	80%	5%	10%	35%	70%	Northern Europe
6	10%	80%	5%	10%	35%	75%	Central - West Europe
7	10%	85%	5%	15%	40%	80%	South Europe
8	10%	70%	5%	10%	30%	70%	East Mediter.-Africa
9	0%	40%	0%	5%	10%	40%	Turkey-Iran-Persian G.
10	10%	90%	10%	10%	40%	90%	South Asia
11	5%	80%	3%	10%	30%	60%	China
12	10%	50%	5%	15%	40%	90%	Far-East Asia
13	10%	90%	5%	15%	40%	90%	America - West
14	10%	90%	5%	15%	40%	90%	America - East

Import - Container traffic share

Country group	Group of commodities						
	1	2	3	4	5	6	
1	0%	0%	0%	0%	0%	0%	Caucasian Region
2	0%	15%	0%	0%	0%	15%	Mid-Asian Region
3	0%	30%	0%	0%	0%	30%	Kazakhstan
4	0%	50%	0%	5%	15%	50%	Other CIS
5	10%	80%	5%	10%	35%	70%	Northern Europe
6	10%	80%	5%	10%	35%	75%	Central - West Europe
7	10%	85%	5%	15%	40%	80%	South Europe
8	10%	70%	5%	10%	30%	70%	East Mediter.-Africa
9	0%	40%	0%	5%	10%	40%	Turkey-Iran-Persian G.
10	10%	90%	10%	10%	40%	90%	South Asia
11	5%	80%	3%	10%	30%	60%	China
12	10%	50%	5%	15%	40%	90%	Far-East Asia
13	10%	90%	5%	15%	40%	90%	America - West
14	10%	90%	5%	15%	40%	90%	America - East

1	2	3	4	5	6
Agri Prod Livestock	Foodstuff	Mineral pr. Chemicals	Metal	Equipment Vehicles	Textile-Ma-nuf.goods

CONTAINER DISTRIBUTION BY CORRIDOR

Table 3

Caucasian Region

Group of countries	Corridor						
	CIS	North-West	Central-West	TRACECA (Caspian)	TRACECA (Black-Sea)	Southern	Eastern
1	0%	0%	0%	0%	0%	0%	0%
2	0%	0%	0%	100%	0%	0%	0%
3	0%	0%	30%	70%	0%	0%	0%
4	100%	0%	0%	0%	0%	0%	0%
5	100%	0%	0%	0%	0%	0%	0%
6	0%	0%	20%	0%	80%	0%	0%
7	0%	0%	0%	0%	100%	0%	0%
8	0%	0%	0%	0%	100%	0%	0%
9	0%	0%	0%	20%	0%	80%	0%
10	0%	0%	0%	0%	0%	100%	0%
11	0%	0%	0%	40%	0%	60%	40%
12	0%	0%	0%	20%	0%	80%	20%
13	0%	0%	0%	0%	20%	80%	0%
14	0%	0%	0%	0%	80%	20%	0%

Mid-Asian Region

Group of countries	Corridor						
	CIS	North-West	Central-West	TRACECA (Caspian)	TRACECA (Black-Sea)	Southern	Eastern
1	0%	0%	0%	100%	0%	0%	0%
2	0%	0%	0%	0%	0%	0%	0%
3	0%	0%	0%	0%	0%	0%	0%
4	100%	0%	0%	0%	0%	0%	0%
5	0%	100%	0%	0%	0%	0%	0%
6	0%	0%	50%	50%	50%	0%	0%
7	0%	0%	10%	90%	90%	0%	0%
8	0%	0%	0%	80%	80%	20%	0%
9	0%	0%	0%	0%	0%	40%	0%
10	0%	0%	0%	0%	0%	80%	20%
11	0%	0%	0%	0%	0%	40%	60%
12	0%	0%	0%	0%	0%	40%	60%
13	0%	0%	0%	0%	0%	80%	20%
14	0%	0%	10%	70%	70%	20%	0%

Kazakhstan

Group of countries	Corridor						
	CIS	North-West	Central-West	TRACECA (Caspian)	TRACECA (Black-Sea)	Southern	Eastern
1	30%	0%	0%	70%	0%	0%	0%
2	0%	0%	0%	0%	0%	0%	0%
3	0%	0%	0%	0%	0%	0%	0%
4	100%	0%	0%	0%	0%	0%	0%
5	0%	100%	0%	0%	0%	0%	0%
6	0%	0%	70%	30%	30%	0%	0%
7	0%	0%	30%	70%	70%	0%	0%
8	0%	0%	10%	60%	60%	30%	0%
9	0%	0%	0%	80%	20%	80%	0%
10	0%	0%	0%	0%	0%	100%	0%
11	0%	0%	0%	0%	0%	10%	90%
12	0%	0%	0%	0%	0%	20%	80%
13	0%	0%	0%	0%	0%	20%	80%
14	0%	40%	10%	20%	20%	20%	10%

Table 4

CONTAINER MOVEMENT POTENTIAL

Container movement potential (TEU / year)			
Corridor	--------> (export)	<-------- (import)	TOTAL
North - Western	11 581	1 958	13 539
Central Western	31 367	14 731	46 097
TRACECA (Caspian Sea level)	42 662	29 265	71 927
TRACECA (Black Sea level)	47 673	33 053	80 726
South	26 180	28 022	54 203
Eastern	21 960	527	22 487
CIS	48 796	17 017	65 813
TOTAL (not incl.TRACECA Caspian Sea)	187 557	95 308	282 865

Container movement potential (TEU / week)			
Corridor	--------> (export)	<-------- (import)	TOTAL
North - Western	223	38	260
Central Western	603	283	886
TRACECA (Caspian Sea level)	820	563	1 383
TRACECA (Black Sea level)	917	636	1 552
South	503	539	1 042
Eastern	422	10	432
CIS	938	327	1 266
TOTAL (not incl.TRACECA Caspian Sea)	3 607	1 833	5 440

ANNEX 11: CURRENT OPERATIONAL TRAINS SERVICES

Transit time: about 2 days

Changing of locomotives: Nebit-Dag or Kazandzhik, Bami, Ashgabat/Anau, Dushak, Mary, Chardzhev, Farap/Khodzhadavlet

Uzbekistan:

Train formation to Kazakstan:

* transfer trains from the border station Khodzhadavlet (incoming from Chardzhev marshalling station) to Bukhara marshalling station,
* on Bukhara marshalling station in dependence on traffic volume formation of:

  - direct transit trains to Arys (Kazakstan)
  - direct through trains to Shumilova (Tashkent) marshalling station
  - freight trains to Samarkand or Dzhizak marshalling stations

* Samarkand and Dzhizak marshalling yards form trains to Shumilova
* Shumilova forms trains to Arys marshalling station in Kazakstan only (no train formation or splitting up of trains on the interchange station Tchengeldy

Train formation to Turkmenistan:

* all Kazakh trains from Arys are formed to Shumilova marshalling station
* Shumilova marshalling station forms through transit trains with transit and export freight to Bukhara (in average 2 or 3 trains per day) or in case of lack of wagons through freight trains to Samarkand or freight trains to Dzhizak respectively
* between Bukhara and Khodzhadavlet transfer trains are running (to Chardzhev marshalling station)

Transit time 15 - 18 h (without time in marshalling stations)
Handling time on marshalling stations: 20 h (Shumilova), 14 h (Bukhara)

Changing of locomotives: Khodzhadavlet, Bukhara, Samarkand, Dzhizak (interchange between electrified and non-electrified network up to 1997), Shumilova, Tchengeldy

Kazakstan

Train formation

* between Tashkent and Arys through international freight trains (stop in Tchengeldy for border procedures only)
* between Arys and Tchu through freight trains or normal freight trains with service of Tchimkent, Dzhambul and/or Lugovaya (transfer of wagons to the Kyrgyz Railways)
* between Tchu and Almaty as well as Almaty and Aktogay or Druzhba through freight trains

In case of strong traffic flow through going trains from Tashkent to Almaty or Druzhba could be organised. Additional time losses result from train stops on interchange stations between the railway districts of the Alma Atinskaya railways (minimum 1.5-2 h).

Transit time: theoretically 4.5 - 5 days (without handling in Druzhba)
best time for some special block trains 3-3.5 days
in reality up to 12 days in the direction Tchengeldy - Druzhba because of the problems in Druzhba mentioned above

Changing of locomotive: Tchengeldy, Arys, Dzhambul, Tchu, Otar, Almaty, Sary-Ozek, Ush-Tobe, Aktogay, Druzhba

Current operational train services on the TRACECA main corridor

Georgia:

Train formation

in dependence on traffic volume (at present 4-6 trains per day from Poti and Batumi to Tbilissi):

* through trains between Poti and Beyuk-Kjasik (Azerbaidjan border station) and/or
* through trains between Poti and Tbilissi marshalling station as well as transfer trains between Tbilissi marshalling station and Beyuk-Kjasik
* normal freight trains Poti - Samtredia - Tbilissi marshalling station as well as transfer trains between Tbilissi marshalling station and Beyuk-Kjasik

Transit time: 20-22 h in average; 18-19 h as minimum.
Changing of locomotives: Samtredia, Sestafoni, Khashuri, Tbilissi, Beyuk-Kjasik

Azerbaidjan:

Train formation to Baku:

Through freight trains (in case of the incoming trains from Georgia have no wagons for intermediate stations) or trains with one or two intermediate stops (e.g. in Gyandzha) from the border station Beyuk-Kjasik to Baku (mostly to Baladzhary marshalling station)

Train formation to Georgia:

* through freight trains from Baladzhary marshalling station to the border station Beyuk-Kjasik
* Service of intermediate stations by local freight trains
* Transfer between Baladzhary and the port of Baku by transfer trains

Transit time: 25-30 h in average; 18-20 h as minimum

Ferry:[59]

The carrying capacity is limited with a half-train (28 wagons). Taking into consideration the number of ferries available the maximal ferry capacity amounts to 3 full-length trains in two days. The price for the ferry over of a wagon amounts to 24 USD per wagon running metre. Train-ferry traffic of empty wagons has to be paid (50 p.c. of the full tariff) as the railways are not the owners of the ferry. With railway traffic by land the return of empty wagons has not to be paid due to the regulations for transports within the CIS, but return of wagons from Poti and Baku by land is not possible as the routes are blocked (Abkhasia, Tchetchnia).

Turkmenistan:

At present no through going transit trains are running from Turkmenbashi to the Uzbek border.

Train formation to Uzbekistan:

* through freight trains from Turkmenbashi to Ashgabat (marshalling station)
* through freight trains from Ashgabat marshalling station to Chardzhev (marshalling station)
* transfer trains from Chardzhev marshalling station to the Khodzhadavlet border station (without intermediate treatment further to Bukhara)

* incoming transfer trains from Khodzhadavlet border station to Chardzhev marshalling station
* through freight trains from Chardzhev marshalling station to Anau marshalling station (Ashgabat junction)
* through freight trains from Anau marshalling station to Turkmenbashi

[59] assessed from the railway point of view only

Time spent at border (control[60]):

Georgia/Azerbaidjan:	in Gardabani 0.5 h, in Beyuk-Kjasik 1-2 h
in Turkmenbashi	3 - 5 h
Turkmenistan/Uzbekistan	minimum 3.5 to 4 h
Uzbekistan/Kazakstan:	in Tchengeldy 2.5 to 3 h
	no border controls on the short trans-Kazak section via Dzhetysaj (section belongs to Uzbekistan Railways)
Druzhba	1.5 - 2 h (border and customs control only)

[60] times on border are minimal times