

CHAPTER 11 CONSTRUCTION OF AKTAU LOGISTICS CENTER

11.1 General

11.1.1 Nature of the Project

Aktau Port located on the east coast of the Caspian Sea, is an ice-free port and functions as a gateway for international cargos to/from the Caucasus, Iran and Turkey, etc. At present, commodities handled at the port are mainly bulk cargos such as oil, gas and mineral ores and a few general cargos.

The population in Mangystau Oblast in 2007 is 390,531 and this Oblast is the least populated in Kazakhstan. The population in Aktau City, the capital of this Oblast, is 194,589 in 2007 and accounts for about 50% of the Oblast's population. Major industries in Mangystau are related to oil and natural gas and their products, and account for 1,000 billion Tenge in 2007. In proportion to the increase of oil and gas production, rapid economic growth is expected in Mangystau. (GDP per capita in Magystau is the second largest in Kazakhstan following Atyrau Oblast.)

The Mangystau Oblast Government announced an integrated Land-Sea-Sky project in 2006. This project includes economic development strategies, which consist of the following eight (8) components:

- Expansion of Special Economic Zone (SEZ) 'Morport Aktau'
- Development of Aktau and Kuryk Ports and related infrastructure
- Development of road and sea networks
- Development of energy related industry
- Promotion of Aktau City development
- Development of Aktau International Airport
- Caspian Sea Technology University
- Promotion of tourism

Based on the background mentioned above, the proposed Aktau Logistics Center Project is described as follows.

- 1) The Aktau Logistics Center features the new concept for a modern logistics terminal of multi-modes – allowing shipment by railway, truck and sea and multi-functions such as transshipment, storage and processing goods for general container cargos.
- 2) This Center is a gateway of international export, import and transit container cargos.
- 3) This Center, located at 'Morport Aktau' in the SEZ, plays an important role in effectively transshipping, storing and distributing raw materials and processed goods produced in the SEZ.
- 4) The Center also functions to store and process consumable goods necessary for people in Aktau City.

11.1.2 Purpose of the Study

The purpose of the Feasibility Study is to comprehensively evaluate the feasibility of the construction of the Aktau Logistics Center based on the following aspects:

- 1) Formulation of the Aktau Logistics Center with optimum construction size based on the forecast freight

traffic consisting of a) export/import and transit cargos, b) cargos from the special economic zone and c) consumable freight traffic necessary for people in Aktau City

- 2) Preliminary design and cost estimation of the project
- 3) Economic and financial analysis
- 4) Formulation of the implementation plan

11.1.3 Study Approach

Figure 11.1-1 illustrates the procedural flow of the logistics center development at Aktau Station. The flow consists of the following steps.

- (1) Present conditions of Aktau Logistics Center and identification of issues

The present conditions of freight traffic, operation and facilities in Aktau are analyzed. Based on the analysis, problems and issues are identified.

- (2) Freight traffic demand forecast at Aktau Logistics Center

Based on the present conditions of freight traffic at Aktau Logistics Center and the socio-economic framework in Kazakhstan and neighboring countries, freight traffic demand at Aktau Logistics Center is forecast.

- (3) Concept plan formulation for the Aktau Logistics Center Development

To meet the present problems, issues and projected future traffic demand, the concept plan of Aktau Logistics Center development will be formulated taking into account the following factors.

- a) Aktau Logistics Center improvement plan No. 676 approved by the Government
- b) Special economic zone
- c) Construction plan of new railway line between Khorgos and Saryozek

- (4) Environmental and social considerations

Environmental and social consideration study on Aktau Terminal is carried out.

- (5) Preliminary design of Aktau Logistics Center

The preliminary design of Aktau Logistics Center is carried out and construction costs as well as maintenance and operation costs are estimated on the basis of quantity estimates and unit cost analysis.

- (6) Economic and financial evaluation

Aktau Terminal plan is analyzed economically and financially. Based on the analysis, economic feasibility and financial viability are evaluated.

- (7) Formulation of implementation program

Lastly, an implementation program is formulated and an investment program is presented.

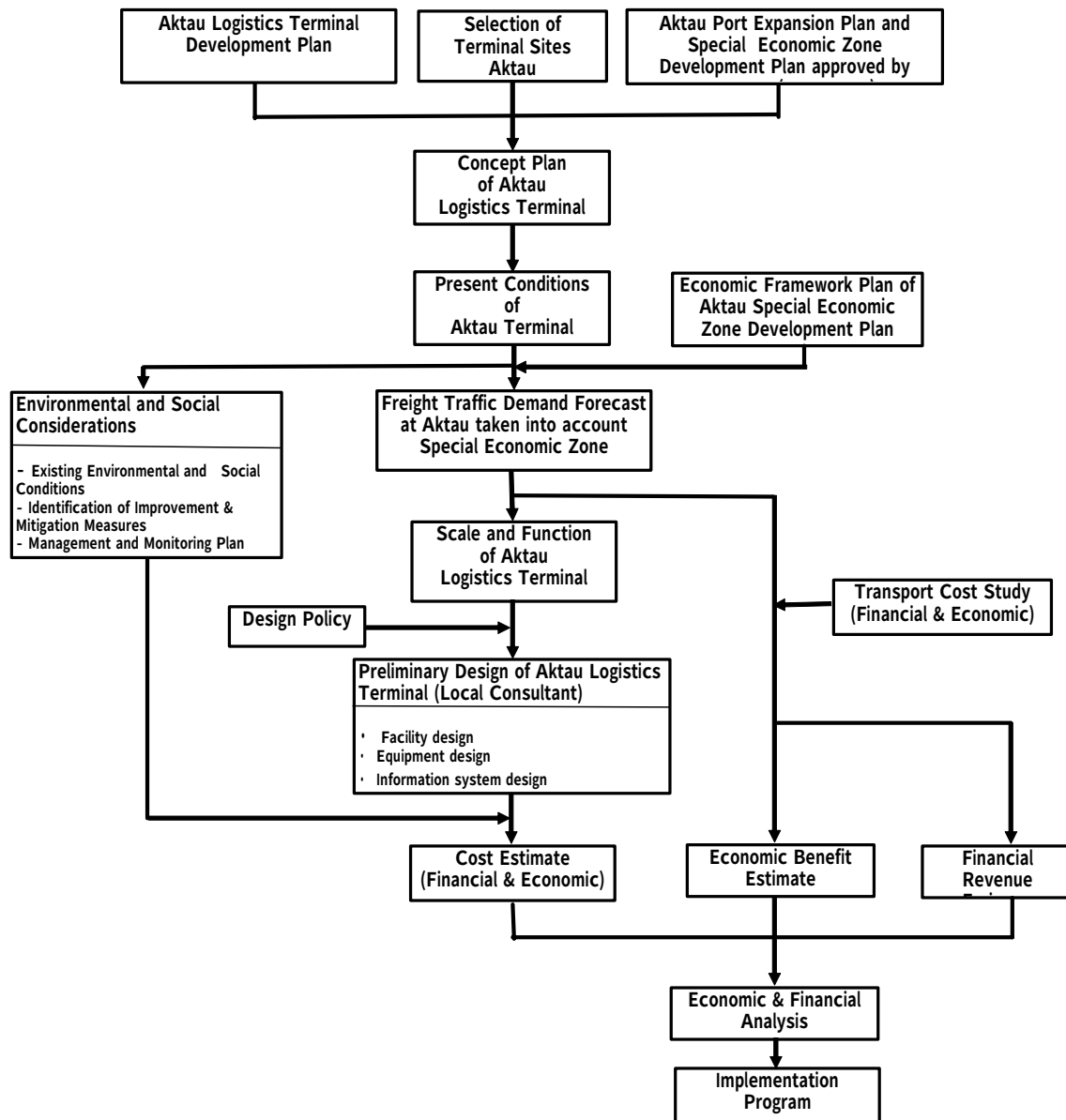


Figure 11.1-1 Flow Diagram of Development of Aktau Logistics Terminal

11.2 Present Conditions in Aktau

11.2.1 General Conditions

Aktau Port is the most important port in Kazakhstan. Aktau City is situated as a hinterland of the port.

The port is used for passenger and freight transportation. Transportation of railway stock has been carried out by ferry without loading and unloading at the port between Aktau and Baku or Turkmenbashi.

Natural conditions of Aktau Port are as follows.

The surface is sand from the wharf to about 20m inland and chestnut soil mixed with sand follows further inland.

The surface soil layer is 10m in depth from the surface; under the surface layer, there is a rocky layer. The rocks are cut to obtain broken stones (macadam) for road construction materials.

There are few earthquakes compared to the Almaty region.

The superior wind direction is east and southeast as shown in Figure 11.2-1 Superior Wind Direction, and wind velocity is under 20 m/s.

Precipitation is 150~200mm per year.

Average temperature varies from -6°C in winter to $24-28^{\circ}\text{C}$ in summer.

The formation of ice within the Sea Port of Aktau starts from sludge ice, shore ice and fast ice. It has a discontinuous character and is not a concern.

There are no private houses in the area of Aktau Port Container Logistics Center Plan.

Pictures of the site



The details are as follows, mainly referring to documents from Aktau International Commercial Sea Port.

11.2.2 Wind

The wind regime around the port is conditioned on a barometric circulation regime and thermal cycles. During the cold season (November-March), the east, north-east and south-east winds have the greatest recurrence. This is conditioned not only on the barometric but also the thermal cycles related to the intensification of cold air mass transfer from the desert to the sea.

In summer season, the air mass is predominantly transferred from the high latitudes. That is why the wind with the north constituent prevails. In summer under the anticyclone weather, breezes with a regular daily change of wind are observed: during the day, the direction is from the sea to the mainland; during the night, the direction is from the mainland to the sea. During cyclonic weather, the breezes disappear.

During the year, winds from the east, south-east and west directions prevail.

Table 11.2-1 Wind and Calm Average Annual Direction Recurrence (%)

North	North-East	East	South-East	South	South-West	West	North-West	Calm
9	14	19	19	4	4	17	14	3

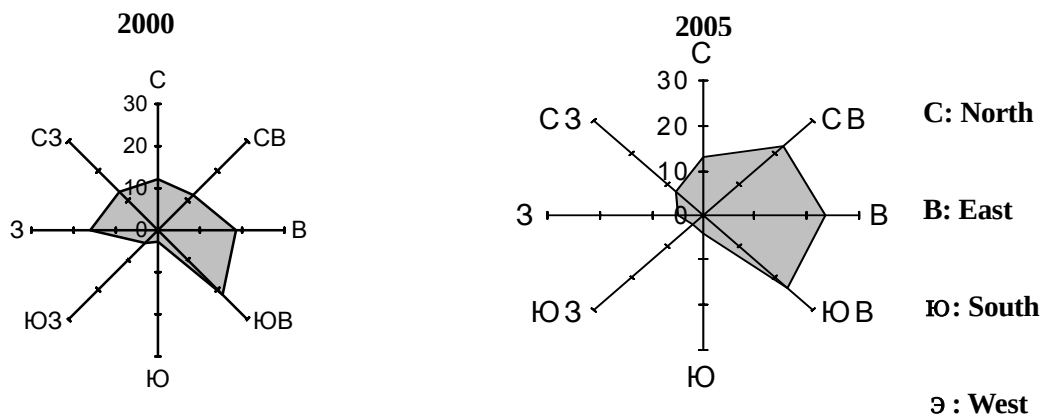


Figure 11.2-1 Superior Wind Direction

The average annual wind speed is 4.6 m/sec. Due to high gradient of the atmospheric pressure, the highest monthly and maximum wind speeds are observed during the cold season (Table 11.2-2,- 11.2-4).

Table 11.2-2 Average Monthly and Annual Wind Speed

Months	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Average Annual
V, m/sec	5.3	5.0	5.0	4.7	4.2	4.1	4.1	4.0	4.2	4.5	4.9	5.0	4.6

The predominant wind speed from all directions during the summer season is 2-5 m/sec. The recurrence of the wind speed increases significantly in autumn: $V \geq 8$ m/sec shown in Table 11.2-3.

Table 11.2-3 Average Number of Days with Wind Speed Equal or Above the Prescribed Value

Months	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Year
$V \geq 8$ m/sec	14.4	12.5	14.4	13.1	10.4	10.8	11.1	9.8	10.4	12.4	13.1	14.0	14.6
$V \geq 20$ m/sec	0.2	0.1	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	2

Table 11.2-4 Maximum Wind Speed and Wind Gusts according to Weathercock (W) and Wind Meter (WM)

Months	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Year
$V, \text{m/sec}$	24	24	20	24	20	18	24	16	18	20	20	24	24
	w	wm	w	wm	wm	wm	wm	w	wm	w	w	wm	wm
Gust, m/sec	36	28	24	28	24	20	20	20	20	22	24	40	40
	w	wm	w	wm	wm	wm	wm	w	wm	wm	w	wm	wm

11.2.3 Fog and Thunderstorms as Dangerous Atmospheric Agents

At the sea port, foggy evaporation is observed that occurs over the water surface due to inflow of cold air from the mainland and the shore fogs that occur due to transfer of humid air from the water surface and cooling down of such air at the shore.

The maximum number of foggy days (8-12 days per months) is observed in April, May and June. In winter, the number of foggy days goes down to 4-5 days. The average annual number of foggy days is 26 days, but during certain years the number of foggy days increased up to 51 days.

Thunderstorms are observed most often in summer and rarely in spring and autumn. Only a few thunderstorms are observed in winter and they are not as intense as summer storms. There are an average of 4 days with thunderstorms a year.

11.2.4 Water Level of the Caspian Sea within the Sea Port Area

The level of the Caspian Sea, as a big closed lake not connected with the world's oceans, is subject to century and inter-seasonal fluctuations. These fluctuations refer to the volumetric changes of the water balance constituents. (Figure 11.2-2)

Many water-level researchers of the Caspian Sea determined that during the last 500 years the low and high

levels of the sea have been changing. Monitoring of the Caspian Sea Level started in 1830. From 1830 to 1930, average annual sea levels fluctuated within the range of one meter. High water at the level of -25.4 was observed during 1868-1869 and 1877-1883. In 1882 the average annual level reached -25.2 meters – this is the highest level during the period of instrument observations. The relatively low level of the sea at -26.2 m was observed in 50s decade of the 19th century and in 1911-1914. Between 1840 and 1929, the average sea level was -25.5m. The fluctuation rate of the average annual sea level during this period did not exceed ± 0.6 m. Since 1930, the level of the Caspian Sea has been falling. The most marked lowering of the water level (1.68 m) occurred between 1933 and 1941. Since 1941, the water level has tended to be relatively stable. There was a minor change of the sea level during 1941-1950 (within 20 cm). Between 1951 and 1956, the sea level fell 60 cm mainly as a result of anthropogenic factors (construction of large reservoirs in the Volga River and inflows as well as the Ural and Kura Rivers). Between 1957 and 1970, the sea level was dropping an average of 2 cm per year (1971-1975, 7-9 cm per year).

The greatest fall of the sea level was observed in 1975-1977 when the average level declined by 32 cm. In 1977 the level of the Caspian Sea was the lowest in the last five centuries (-29.03 m). Dropping of the sea level was conditioned by the low inflow of surface river water. During the five years 1972-1976, the average annual inflow of the river water was approximately 60 km³ less than the average over-year volume (303 km³). Rise of the sea level in 1978-1995 was caused by the increasing inflow against the background of the lowest level. In 1995, the average annual sea level rose up to (-26.63m). From 1997 till 2000, the average annual sea level was almost stable at (-27.1 to -27.14 m). In 2000, there was a minor lowering tendency of the sea level and such a tendency will probably continue in the near future.

The level of the Caspian Sea is concerned with the content of the Feasibility Study of the Aktau Logistics Center near Aktau Sea Port.

(unit: m)



Figure 11.2-2 Caspian Sea Background Level Fluctuation Chart

11.2.5 Salinity

Salinity of the North Caspian Sea is determined mainly by the flow of the Volga and Ural Rivers and water exchange with water of the Middle Caspian Sea.

Spacial variation of water salinity in the North Caspian Sea is determined by the river flow, water dynamic, bottom contour and evaporation.

Excluding the river flow, the wind flows also affect the nature of the salinity distribution as well as water exchange between the western and eastern parts of the North Caspian Sea and between the North and Middle Caspian Sea. During significant evaporation, a negative fresh water balance is formed in the eastern part of the sea. This results in compensating water flow from the Middle Caspian Sea and formation of increased central salinity. The average over-year value of salinity in the North Caspian Sea is 0.91%. Annual change in salinity is connected with the rivers' flow. During the last 50 years, the average annual values of Caspian Sea salinity changed from 1.14 to 0.64%. The salinity field of the North Caspian Sea is changing quickly under the wind force.

During 1970-1977, as a result of lowering the Caspian Sea level to -29.03m, the salinity level in the North Caspian Sea increased, with the most significant increase taking place in the eastern part of the sea. The areas of water with a level of salinity higher than average in the Caspian Sea are located along the east coast.

The average salinity rate of the sea water around Aktau is 1.31%, with changes from 1.2 to 1.56%.

11.2.6 Geological Condition

The attached figure is the result of the surveys for the rehabilitation of Aktau Commercial Sea Port (Figure 11.2-3).

GEOSAN DOĞAL KAYNAKLAR VE HANDELERLER SAN. VE TİC. A.Ş. Reysanlar Cad. 27/7 Şişli-İst. Tel.: 341 41 82-341 42 94										BOREHOLE LOG			BOREHOLE NO.: BH-4		
CLIENT : AKTAU PORT REHABILITATION PROJECT GEOTECHNICAL INVESTIGATION										PROJECT-LOCATION : Aktau-Kazakhstan					
ROCK			SOIL								Depth (m)	Lithology	Class		EXPLANATIONS
TCR		SCR	RQP		SPT				Sample				Soil	Rock	
X	Grph.	X	Grph.	X	Grph.	Value	Graphite + 10 20 30 40 50 60		No	N ₆₀					
									1	27		1.45		 SAND: Fine to medium grained, some rounded fine to medium, gravelly, slightly cemented, include organic material between 2.0-2.5m, greenish grey-beige, MEDIUM DENSE-DENSE	
									2	31		2.45			
									3	35		3.45			
									4	18		4.45			
									5		5.50		5.00	 CLAY: Silty, fissured, include marl level between 7.7-8.5m, greenish grey, STIFF-VERY STIFF	
									6	12		6.25			
									7		7.60		7.25		
									8	12		8.40			
65			30						9	74/2			8.40	 MARL: Laminated, mat surface, fractured, white-beige-light grey, VERY STIFF-HARD	
													8.50		Very poor
47			34										10.00		Fair
70			34										11.00		Fair
64			34										12.00	Very poor	 LIMESTONE: Composed lime cemented shell, include clayey level between 25.5-28.5m, fractured, horizontal layers, light grey-grey, MEDIUM HARD
74			30										14.00	Very poor	
80			50										15.00	Fair	
70			50										16.00	Fair	
87			34										17.00	Very poor	
80			30										18.00	Fair	
84			34										19.00	Very poor	
90			37										20.00	Fair	
84			74										21.00	Very poor	
80			74										22.00	Very poor	
70			65										23.00	Fair	
75			30										24.00	Fair	
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													30.00		
Boring Technique : Rotary			Elevation :			GWL Depth :			Borehole Length : 30.00m						
Dates : 14-15.08.1997			Driller : Y. SONISIK			Engineer : C. MECIT			Control : U. HULAGU		APP-				

Figure 11.2-3 Geological Condition of Aktau Commercial Sea Port

11.3 Freight Traffic Demand Forecast

11.3.1 Present Freight Traffic Demand

(1) Status of Aktau Port in Terms of Maritime Cargo Volumes in the Caspian Sea

Aktau Port is located on the eastern shore of the Caspian Sea and designated as the gateway of marine transport in the Caspian Sea to and from Kazakhstan. To recognize the potential of Aktau Port, current conditions of the ports located along the Caspian Sea are analyzed with the data regarding freight volumes and port capacities.

Table 11.3-1 shows the current situation of each port on the coast of the Caspian Sea.

**Table 11.3-1 Capacities and Cargo Handling Volumes
of the Ports in the Caspian Sea**

(Unit: million tons per year)

Country	Port	Port Capacity	Cargo Loading/Unloading
Kazakhstan		13	11.4
	Aktau	11	10.1
	Kuryk	-	-
	Bautino	2	1.3
Russia		17	10.37
	Astrakhan	6	5.2
	Makhachkala	10	5
	Olya	1	0.17
Turkmenistan		10.6	5
	Turukmenbashi	7	5
	Alaja	2.4	
	Okarem	1.2	
Azerbaijan		30	6.8
	To box	8	5.3
	Diubendy	12	1.5
	Sangachaly	10	-
Iran		17	12.8
	Amirabad	5	2
	Anzali	5	5
	Noushakhr	1.5	0.8
	Neka	5.5	5

Note: Shows 2005 figures.

Source: Aktau International Sea Commercial Port

Aktau Port is the largest port in Kazakhstan. It also belongs to a relatively larger group of ports compared with ports existing in other countries. Kuryk port does not exist at present but it is expected to share future maritime freight generated in Kazakhstan. With inclusion of Bautino Port, 3 ports are expected to be the future logistics focal points for maritime trade in the Caspian Sea. Regarding port capacity expansion, construction of new quays and anchorage will be undertaken in the northern part of the existing port area along with the port expansion plan.

(2) Current Cargo Shipments from Aktau Port

The trend of cargo volumes shipped from Aktau Port for 1999-2005 is shown in Table 11.3-2.

Table 11.3-2 Cargo Volume Trends at Aktau Port (Unit: thousand tons)

Type of cargos		Year						
		1999	2000	2001	2002	2003	2004	2005
1.	Oil	2066.8	3385.50	5035.4	5552.4	6970.7	8289.2	8912.7
2.	Metal	235.4	701.50	1060.1	571.2	835.5	1011.5	1025.2
3.	Grain	7.6	19.50	84.1	209.2	5.4	13	33.3
4.	Others	38.0	42.70	22.8	22.9	22.6	33.6	71.3
5.	Ferry cargo	-	26.00	199.2	592.6	245.5	344.6	350.1
Total		2347.8	4175.2	6401.6	6948.3	8079.7	9691.9	10392.6

Source: Kazakhstan Sea Transport Development Plan

At present, total cargo volumes of 10 million tons are shipped at Aktau Port including 9 million tons of oil cargo and 1 million tons of metal. The rest of the cargo remains under 1 million tons. Out of these cargos, dry cargos including ferry cargo and others are assumed to be related with the logistics center.

11.3.2 Future Economic Framework of Mangystau Oblast

(1) General

Future freight demand is forecast based on the future economic framework of Mangystau Oblast. Therefore, it is necessary to forecast the future Mangystau economic frame. There are two kinds of economic statistical data in Mangystau Oblast. One is Gross Regional Domestic Product (GRDP) published by the National Government. The GRDP of Mangystau Oblast was 585,509 million tenge while the GDP of Kazakhstan was 9,106,624 million tenge in 2006. Mangystau GRDP accounts for 6.4%. The other is industrial product data published by the Mangystau Oblast Government. The industrial product of Mangystau Oblast in 2006 was 965,013.8 million tenge. This industrial product is higher than the GRDP, as calculation methods are different. The forecast in this JICA Study is based on the national statistical GRDP, because the GRDP covers wider economic activities while industrial products cover only industry, including the mineral resource industry. However, the industrial product growth rate forecast by the oblast government is used for this GRDP forecast.

(2) Forecast Method

The oblast government forecasts industrial products till 2010 in gross and net terms. The GRDP forecast in this Study uses the net industrial product growth rates to the GRDP. Since there is no regional forecast growth rate from 2011, elasticity of the Mangystau GRDP growth rate to the national GDP growth rate is analyzed in past data and used by multiplying it with the annual national growth rate, 9%, published in “Transport Strategy 2015”.

In addition, Mangystau Oblast has a Special Economic Zone (SEZ) development plan. For that plan, the oblast

government asked private companies to invest in the SEZ and got the proposed location proposal from the companies. The proposal list includes investment amount, number of employees and required area. The implementation of this SEZ plan will result in additional economic growth. The forecast economic growth may include the SEZ development effects, but it can be considered that the forecast economic growth rate is a kind of trend and does not include the SEZ development impacts. Therefore, in this Study, the SEZ investment and resulting economic activities of invested plant operation should be additional to the trends. However, the list does not have sufficient information because there are some blanks such as investment amount, number of employees or required area. In order to supplement the missing data, similar industry data within the list, or industrial data in the Kazakhstan Statistical Yearbook, were processed and used for estimating necessary investment, number of employees or required area. In addition, industrial products of the proposed plant are estimated multiplying number of employees by product per employee in each industry, using figures obtained from the Kazakhstan Statistical Yearbook. Furthermore, since the proposed areas on the list with supplementary estimated data do not reach the planned SEZ area (80% of 597.8 ha, because the assumption is that 20% will be used for utility use such as roads, greenery and waste water treatment facilities), the investment, employment numbers and industrial products of the remaining area are estimated by multiplying the rate of the total planned area (80%) and the sum of proposed areas including estimated blank space.

The target year for completion of the planned SEZ is 2015, but the Mangystau Government considers that the SEZ completion may be 2050 in a longer case. Therefore, in this Study, the maximum, minimum and medium term cases assume 2015, 2050 and 2030 as the completion years, respectively.

(3) Forecast Result

According to the method above, the forecast result is shown in Table 11.3-3.

Table 11.3-3 Forecast Economic Framework of Mangystau Oblast (Unit: Billion Tenge)

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
GRDP(Gross)	402	586	647	691	692	734	844	970	1,115	1,282	1,474	1,695	1,948
GRDP(Net: 2006 price)	475	586	647	699	697	755	843	941	1,050	1,172	1,309	1,461	1,630
Max	475	606	689	762	781	860	969	1,088	1,218	1,361	1,518	1,670	1,840
Medium	475	594	664	724	731	797	893	1,000	1,118	1,248	1,392	1,553	1,731
Min	475	590	657	713	716	779	871	974	1,088	1,214	1,355	1,512	1,686

Source: JICA Study Team

11.3.3 Future Freight Traffic Demand

(1) General

As for the demand forecast for the logistics center, the basic demand consisting of the following 3 elements is assumed.

1) Freight demand originating in the SEZ development

It is foreseen that many industrial facilities will be built up in SEZ (Special Economic Zone) of Aktau Port and generate a certain amount of freight flow after they start the manufacturing process from input of original resources to output of final products. The freight volume will depend on the type and scale of industrial development in SEZ.

2) Freight demand transferred to and from Aktau Port

Aktau Port has its own logistics functions and most port cargos will be handled by the port freight facilities. But some of the port cargos are assumed to be channeled by the new logistics center because it has the ability to complement or substitute the logistics functions at the port through the modal connecting functions provided by the logistics center.

3) Freight needs related to consumer goods in Aktau City

As one of the important freight distribution points in Aktau City, a considerable part of the physical goods consumed in Aktau City will be handled at the new logistics center.

(2) Freight Demand from the SEZ Development

1) Methodology

Based on the economic framework of SEZ, future production and shipment amount from/to the manufacturing facilities established in SEZ was estimated. Using the latest statistical data on the product/shipment volumes of the manufacturing industry in Kazakhstan Statistical Yearbook 2006, the conversion factors from monetary unit to physical production unit are estimated by product type. 8 product type categories are used, i.e., ferrous metallurgy, non ferrous metallurgy, other non-metallic mineral products, fabricated metal products, rubber and plastic products, food products, textile and others, taking the SEZ development plan into account. As for the freight volumes resulting from production activities, it is necessary to include the freight needs accompanied by the industrial input like raw materials for the production process. To estimate freight volumes with the intermediate input, industrial matrix data are employed. Based on the input output matrix of inter industrial relation, the intermediate input coefficient (intermediate product amount / final product amount) was calculated.

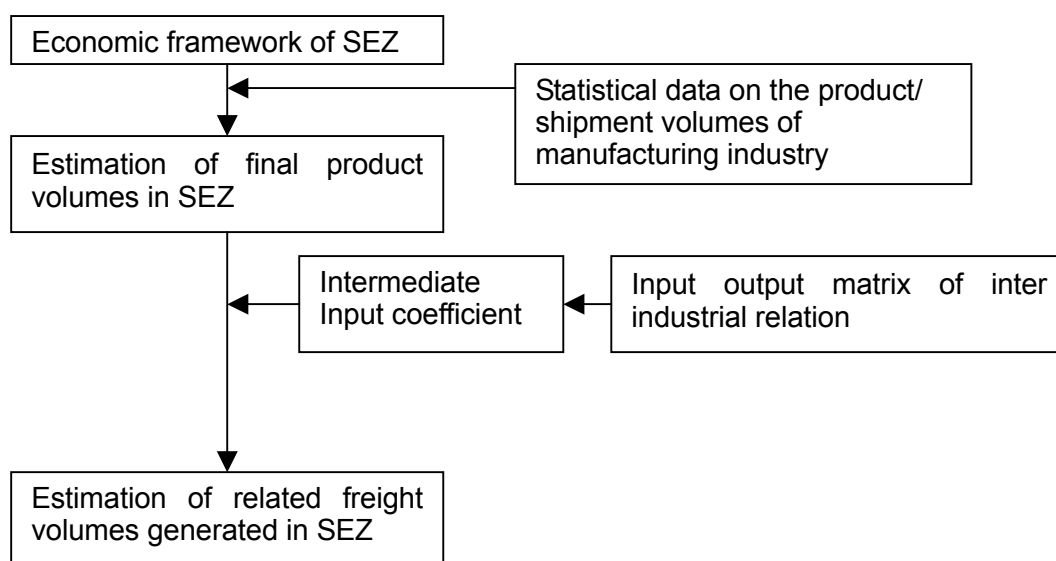


Figure 11.3-1 Flow Chart for Estimating Demand Related to SEZ

2) Estimation result of freight demand generated in SEZ

Following the methodology specified before, demand estimation was conducted using the economic framework and the related statistical data.

The estimation result is summarized as follows.

- Total production amount: 56,503 million KZT
- Related freight demand: 2.88 million tons/year (0.78 for final product and 2.10 for intermediate input)

(3) Freight demand transferred to and from Aktau Port

The future projection for dry cargos at Aktau Port is forecast by Aktau International Commercial Sea Port as shown in Table 11.3-4.

Table 11.3-4 Transshipment Cargos through Aktau Port (Unit: million tons)

Commodity type	2011	2016
Oil cargos	17.7	19.5
Steel	1.0	1.5
Grain	0.7	1.0
Chemical products	0.5	1.0
Food products (tomato paste, tea)	0.8	1.2
Containers	1.0	1.5
Others	0.7	1.5
Dry cargo total	4.7	7.7
Total	22.4	27.2

Source: Aktau International Commercial Seaport

For the adjustment due to the difference in objective year, future freight demand of Aktau Port is estimated in 2010 and 2017 applying the same growth rates from 2011 to 2016. The result is shown in Table 11.3-5:

Table 11.3-5 Estimation Result of Future Freight Demand at Aktau Port (Unit: million tons)

Commodity type	2005	2010	2017	2017/2005
Oil cargos	8.9	17.3	19.5	2.2
Steel	1.0	0.9	1.6	1.6
Grain	0.03	0.6	1.1	36.7
Chemical products	0.07	0.4	1.1	40.0
Others		0.5	1.7	
Food products	0.35	0.7	1.3	8.3
Containers		0.9	1.6	
Dry cargo total	1.45	4.1	8.3	5.7
Total	10.35	21.4	27.8	2.7

Source: JICA Study Team

Out of the total freight flow, oil cargos are excluded from the demand because they mostly depend on the pipeline mode. In addition, it is assumed that freight volumes related to raw materials and primary goods are also excluded from demand. Furthermore, 20% of the freight volume at Aktau Port is assumed to use the logistics center. Based on this assumption, freight demand in 2010 and 2017 is estimated as follows:

- Freight Demand in 2010 = 0.50 million tons
- Freight Demand in 2017 = 1.14 million tons

(4) Freight needs related to consumer goods in Aktau City

This freight demand is estimated according to the following process.

- Obtaining the final consumption amount per capita by consumer goods type from the statistical yearbook
- Estimation of equivalent weight values of final consumption per capita using price/weight conversion factors
- Estimation of the freight demand related to final consumption in Aktau City multiplying the unit weight of final consumption per capita with the population size in Aktau City.

The annual average consumption amount per capita in Kazakhstan is estimated to be around 324,900KZT, which was converted to be approximately 1.1 ton per capita using the conversion factor. Multiplying this with the latest total population of Aktau City, 195,000, total freight volume related to consumption in Aktau City is estimated at 0.22 million tons per year.

(5) Forecast Result of Freight Demand Regarding the Logistics Center at Aktau Port

Aggregating each freight demand element, total freight demand of the logistics center at Aktau Port is estimated as shown in Table 11.3-6.

Table 11.3-6 Freight Demand Estimation for the Logistics Center at Aktau Port

(Unit: million tons per year)

Freight category	2010	2017
Freight volumes related to SEZ	1.72 (assuming 60 % of the performance rate as of 2010 to 2017)	2.88
Freight volumes related to Aktau port	0.50	1.14
Freight volumes related to final consumption in Aktau city	0.22	0.22
Sum	2.22*~2.44	4.02*~4.24

Note: *Shows the case excluding demand related to final consumption in Aktau City.

Source: JICA Study Team

11.4 Concept Plan for Aktau Logistics Center

11.4.1 Concept of Land-Sea-Sky Development

The Mangystau Oblast Government announced that a Land-Sea-Sky Development will be promoted by the year 2015. The composition of the Land-Sea-Sky Development is as follows (See Figure 11.4-1).

- Special economic zone (Morport Aktau Expansion)
- Kuryk Port and its infrastructure development
- Development of roads and railways
- Development of energy industry
- Promotion of Aktau City development
- Redevelopment of Aktau International Airport
- Caspian Industry and Technology University
- Tourism development cluster

**Figure 11.4-1 Land-Sea-Sky Development Concept**

The special 'Morport - Aktau' economic zone is summarized as follows.

- Commencement of the project: January 1, 2003
- Target year : 2015
- Present area for development: 227.1 ha
- Expanded area for development: 982.3 ha

11.4.2 Location of Logistics Center

According to the Land-Sea-Sky Development plan, the Aktau logistics center is designated to be located in the south of the special economic zone adjacent to the Aktau Sea Commercial Port as shown in Figure 11.4-2. This plan is generally good due to the convenience of access to the Aktau Sea Commercial Port and the railway line operated by KTC.



Figure 11.4-2 Location of Aktau Logistics Center

11.4.3 Conceptual Plan of Aktau Integrated Logistics Center

(1) Integrated Logistics Center

The Aktau Integrated Logistics Center deals with freight traffic generated / attracted from / to

- The Aktau free trade zone (special economic zone)
- Aktau City
- Aktau Port

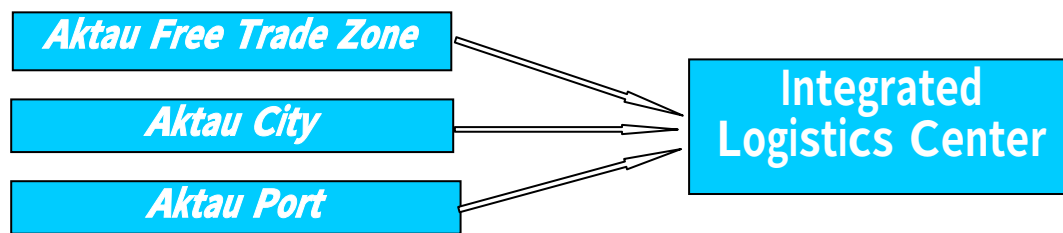


Figure 11.4-3 Development Concept for Integrated Logistics Center Project

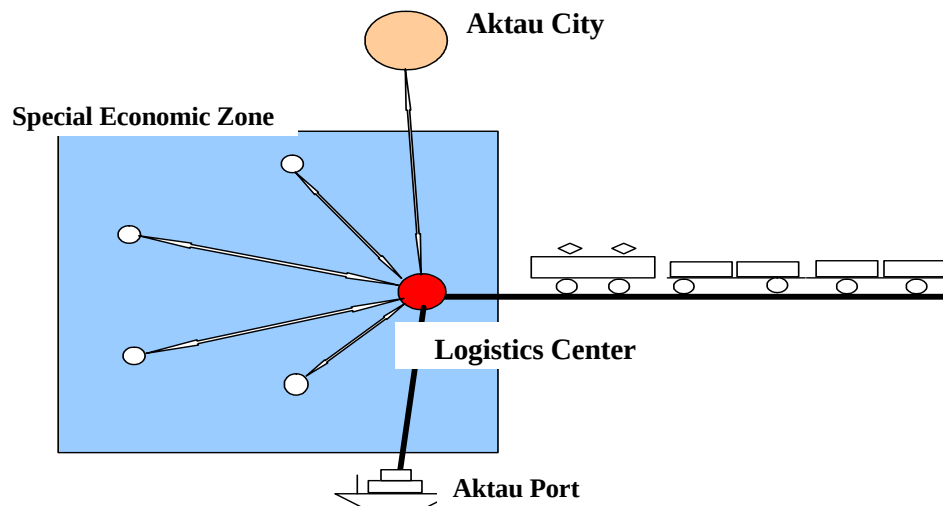


Figure 11.4-4 Integrated Logistics Center Concept

(2) Alternative Mode Provision Schemes

There are three (3) principal alternative schemes applicable to the Aktau Logistics Center.

- Scheme 1: Traditional logistics system (all-railway system)
- Scheme 2: Road-based logistic system (truck system)
- Scheme 3: Multi-modal logistics system

Table 11.4-1 shows a comparative analysis of the alternative schemes for the logistics center. The results of the comparative analysis indicate that Scheme 3, a multi-modal logistic center, is recommended for the Aktau Logistics Center.

Table 11.4-1 Comparative Analysis of Logistics Center Alternative Schemes

	Main Feature	Merit	Demerit
Scheme 1	Traditional logistics system in Kazakhstan using railway system	• transports cargos efficiently • transports with reliability and punctuality during winter period • cheaper transport cost compared with road system • preferable for transporting long distance cargos more than 200 -300 km	• more transport time compared with truck system • not flexible for transporting cargos • not suitable for transporting small lots of cargos • not suitable for providing door to door service without private railway line • Not preferable for transporting shorter distance cargos less than 200 -300 km
Scheme 2	Road-based logistics system using truck system	• less transport time compared with Scheme 1 • flexible for transporting cargos • suitable for transporting small lots of cargos • suitable for providing door to door service without private railway line • preferable for transporting cargos over shorter distance less than 200 -300 km	• not efficient for transporting cargos • difficult to transport with reliability and punctuality during winter period • more expensive transport cost compared with rail system • not preferable for transporting cargos over long distance more than 200 -300 km
Scheme 3	Multi-modal logistics system using all modes of transport system	• able to transport cargo efficiently • less transport time, less transport cost and more flexible than the above 2 schemes • able to transport by type of cargo such as small lot cargos by truck and large lot cargos by private railway • provides door to door services	• need to construct mode change facilities

(3) Logistics Center Functions

In general, a logistics center has the following functions.

- Transshipment between modes
- Shunting yard
- Truck terminal
- Distribution, storage and warehousing
- Cargo loading and reloading
- Processing, packing and utilization
- Freight information
- Customs clearance

There are many development stages for a logistics center.

Table 11.4-2 Alternative Functions Facilitated by a Logistics Terminal

	Option 1	Option 2	Option 3
Transshipment between modes	●	●	●
Shunting yard	●	●	●
Truck terminal	●	●	●
Distribution, storage and warehousing		●	●
Cargo loading and reloading	●	●	●
Processing and packing			●
Freight information		●	●
Customs clearance	●	●	●

It is recommended that Option 2 be applied and that processing and packaging functions be added to Option 2 for the Aktau Logistics Center in the future.

11.5 Preliminary Design of the Aktau Logistics Center

Three functions are necessary for the logistics center installed in the SEZ. The first function is a marketing function for materials, products and goods as a synthetic logistics center for imported products, product stock for re-export, etc. The center should have access to domestic and international information for land, sea and air transport. From the viewpoint of the facility, it is a general logistics center composed of physical logistics facilities such as warehouses, etc.

The second function is to enhance the added-value and carry out packaging, inspection, etc. for imported products.

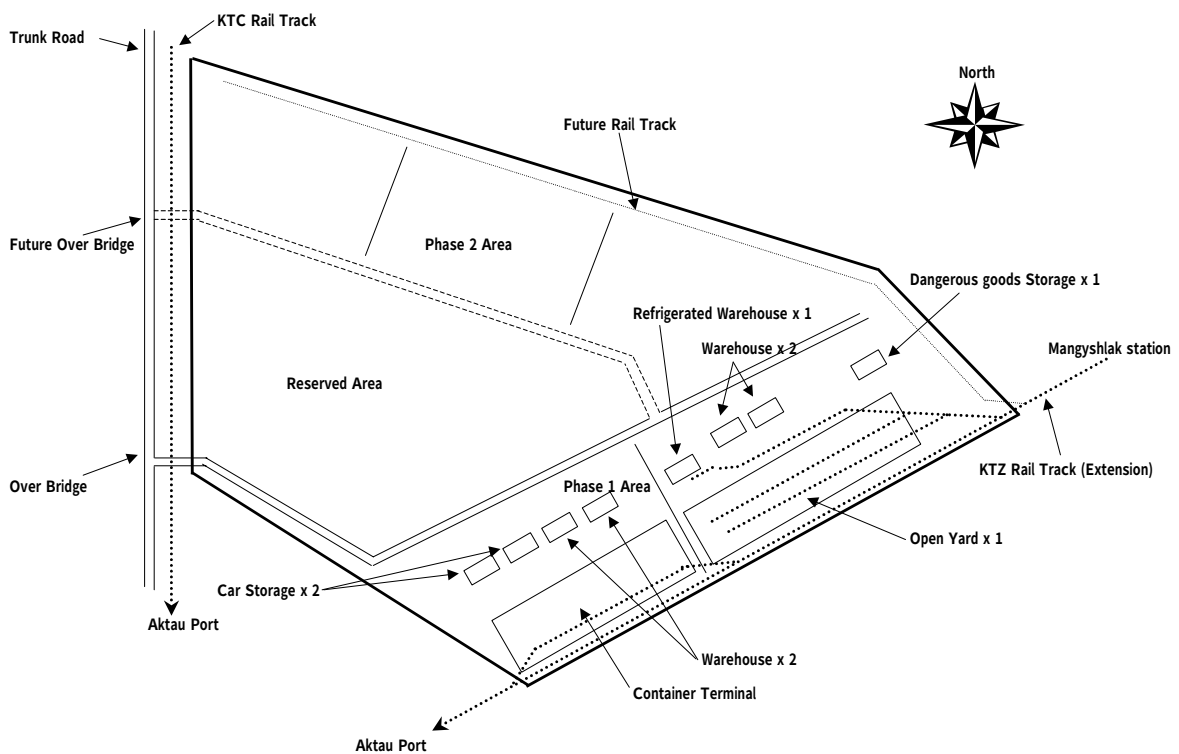
The third is a global network function. This means a logistics system between international dealing points (road, port, airport, etc.) and setting up an information network.

Paying attention to these points, the facility at this stage and equipment proposed based on the field survey with interviews and demand forecast are as follows.

11.5.1 Layout Plan for Aktau Logistics Center

The planned site is flat land with a gross area of 300ha. Its shape is a modified pentagon located about 2km from

Aktau Port. Based on the demand forecast, the whole planned site is divided into three zones which are classified as Phase 1 area, Phase 2 area and Reserved area. These will be developed gradually. The necessary space in consideration of estimated demand is sufficient as divided Phase 1 (100ha). Therefore, this proposal is based on these prerequisites at this stage. The railway runs from the east corner of the plain site to the southeast edge as access in Phase 1. In prospective Phase 2, the railway can run from the east corner to the northeast edge. Smooth traffic flow line on the premises is possible by making a rail plan along the perimeter of the site. Moreover, access by road crosses the existing KTC track with an overpass from the trunk road running alongside the west edge of the site and advances from the southwest corner. The whole area is divided into three as shown in Figure 11.5-1. An internal main road is planned for. A container yard and an open yard along the south-east edge are prepared in Phase 1 area after paving the whole site. Four warehouses for dry cargo, two car storages for import cars, one refrigerated warehouse and one special warehouse for dangerous goods are installed at the back of the yard. The dangerous goods storage is segregated from other facilities for safety. An administration building, transformer substation, fuel station, fire department, maintenance shop, etc. are laid out in the space between the internal trunk road and the warehouses. In the future, in case of overflow of handling cargo volume, additional logistics facilities are installed in Phase 2 area and the internal road is also extended and connects with the trunk road (the overpass is included). The reserved area can be used for others such as a border trade center, a green park, a parking lot for laborers and an exhibition center, etc. Since the whole site serves as a bonded area because of SEZ, the perimeter is surrounded by a fence. Security control of cargo and persons is required at the entrance gate. Regarding environmental issues, waste discharge reduction (promotion of recycling is included) and suitable processing of waste are required.



Source: JICA Study Team

Figure 11.5-1 Layout of Logistics Center

11.5.2 Preliminary Design of Each Facility

(1) Rail Track

As access to the logistics center in connection with the Port and other two SEZs located on the north side, Mangishulak or Pa3 “p” station of KTZ are required. The only existing access between the Port and Mangishulak Station is the KTC rail track along the trunk road, as there is no direct connection to the KTZ track. However, this causes high freight cost because another tariff is used by KTC. For this reason and for through-transportation to the sea port by KTZ, immediate KTZ track extension to the Port is necessary. In the plan, a new track is planned to run into the edge of the southeast planned area. Therefore, the logistics facilities should optimally be located in the southeast of the area. Railway sidings are laid inside the yard of the logistics center (Figure 11.5-2).

If container trains are operated, the sidings would be able to accommodate 21,900 20-foot containers.

When the trains run 6 times per day, the amount of containers is calculated as 131,400 TEUs. This amount is enough for the estimated demand forecast.

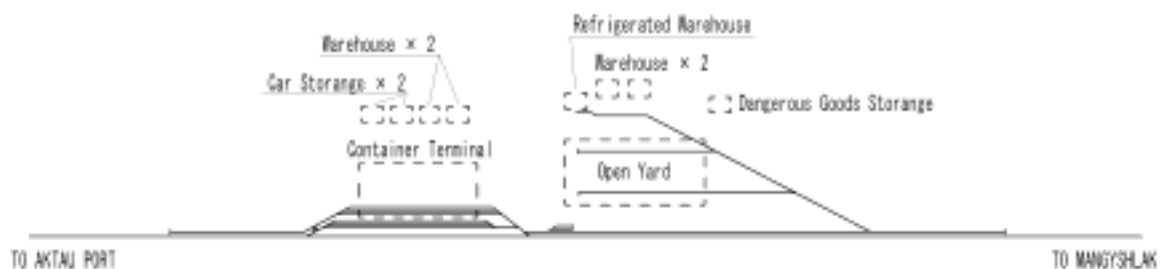


Figure 11.5-2 Track Layout Plan

(2) Road

Current access route to the Port is only by a trunk road which runs on the west side of the planned area to the north and south. Therefore, it is necessary to give access to the planned area from this road. Since KTC's single track is laid in parallel between the planned area and road, the road needs to pass over this track. A railroad crossing is not suitable because of many heavy vehicles going in and out of the logistics center. Although the remaining choice is an overpass or underpass, an overpass is recommended due to cheaper cost and safety from floods. A safe overpass plan to control both directions (north and south) of traffic flow is required. Also a solid sloping ramp structure for heavy vehicles is required, which connects with the gate from the overpass to the internal road in the logistics center. The internal road should be sufficiently wide, but there is no central reservation. The central reservation is limited for traffic flow and the flexibility is reduced.

(3) Internal Facilities

Facilities and equipment corresponding to the handled cargos originating from the SEZ and the Port and transit cargos are proposed. Specifically, they are a warehouse for dry cargos, an imported vehicle storage, a refrigerated warehouse, a dangerous goods warehouse, an open yard, a container yard administration building, etc.

Warehouse for dry cargos

The object is for storage and sorting of containerized consumer goods, dry goods, miscellaneous goods, raw materials, etc. and for LCL (less than container load: consolidated container) handling. It can also be used as a delivery center which serves for distributive processing as necessary. A hangar is constructed as a single-storied storehouse. On the yard side of the hangar, there is a platform 1.2 meters high so that direct docking of container on chassis can be carried out and the road is at the same level so that trucks and forklifts can move directly into the storehouse. Generally, a low-floor style is freely accessible to trucks and forklifts which can use the premises as one yard in the warehouse and the outdoor yard, for higher productivity of handling work. On the other hand, the above-ground platform style has the advantage of the correspondence to the cooperation with rail wagons and cargo work from the rear end of trucks by forklift. Forklifts can go directly to the wagons. This style is also effective for preventing dust from entering and flooding in the warehouse. The proposed warehouse has both these advantages. The on-dock mouth on the yard side is equipped with a dock leveler. Although it is effective to make the whole floor level higher in preparation for emergency like floods, the floor surface slant is set at the minimum for safety. In addition to ceiling lighting, skylights provide sufficient lighting for working safely. The planned space could be @4,600m² x four buildings based on the amount of demand forecast. The calculation in the following table provides sufficient space till 2016, but sufficient space is recommended since there is a possibility of additional distribution processing such as inspection, attaching price tags, and packing and wrapping.

Calculation of warehouse space

Prerequisites			
* Total floor space	18,400 m ²	(@4,600 x 4)	
* Usage ratio in containerized cargo		30%	
* Capacity from experience	9,200 ton/month/4,600m ²		
Total capacity per year	9,200 x 12 x 4 = 441,600 (ton)		
	2011	2016	
Estimated containerized cargo(ton)	258,300	716,560	
Cargo through warehouse(ton)	77,490	214,968	<441,600
Source: JICA Study Team			

Warehouse for vehicle storage

A self-propelled type of three-story warehouse can be considered as interim storage and sorting of imported vehicles from UAE, etc. It protects cargos from sunlight and dust. No sidewalls are installed, for ventilation in the warehouse. The future pace of expansion should be taken into consideration if the monthly import volume exceeds about 500 units (not containerized) at Aktau Port. Therefore, the planned space should be @14,000m² (850 units) x two buildings (total 1,700 units). Moreover, this facility can be used also as a delivery center or an exhibition hall.

Refrigerated warehouse

The inside of the warehouse is divided into four parts. Two parts are classified as Class C (chilled) only with a single temperature range. The other two parts are convertible to Class F (frozen) or Class C. These correspond to the cargos of a broad temperature range. On the yard side, eight on-dock mouths equipped with dock levelers are installed and there is also one platform for rail wagons. Ten units (two units are reserves) of electric power receptacles for reefer containers are available at the on-dock mouths. On the road side, 0.8m above-ground style platforms with eight on-dock mouths for truck loading are envisioned. Moreover, a slope for forklifts is installed at both ends. There is no full-scale refrigerated warehouse in this region, but as consumption increases, demand for frozen food or perishable food is expected to increase in the future. Therefore, the volume is planned as 12,096m³ (practical tonnage in palette cargo work is about 2,400tons). Since the estimated food volume at Aktau Port in 2016 is 1,200,000tons, 20% of the amount is treated at the logistics center and the annual handling quantity becomes 240,000tons. Although cargo generation is expected in other SEZs, it seems few. Regarding the 240,000tons, although it is difficult to estimate or assume the volume of cargos requiring temperature management, demand for refrigerated warehouse space is estimated as shown in the following table, assuming the refrigerated cargo ratio is 10%. Since the container yard has a capacity of 84 40-foot reefer container units as a buffer, this plan seems appropriate.

Calculation of refrigerated warehouse space

Prerequisites	
* Ratio of cargo handled at Logistics Center	20%
* Ratio of refrigerated cargo	10%
* Ratio of containerization (reefer container)	50%
* Total floor space	2,016m ² (@504 x 4)
* Total referigerated space volume	2,016 x height 6m = 12,096m ³
* Max capacity for storage	12,096 x 0.4 x 50% = 2,419ton
* Turnover from experience	0.4
Total warehouse capacity per year	2,419 x 0.4 x 12 = 11,611 (ton)
Yard capacity for reefer container	84 x 40'reefer (@20ton) = 1,680 (ton)
* Estimated duration	7 days/container
Total yard capacity per year	1,680 x 52 = 87,360 (ton)
	2016
Handling volume of food cargo at Port (ton)	1,200,000
Handling volume at Logistics Center (ton)	240,000
Handling volume of refrigerated cargo (ton)	24,000
Containerized (ton)	12,000
Non containerized (ton)	12,000
	< 87,360
	> 11,611

Source: JICA Study Team

Warehouse for dangerous goods

A warehouse conforming to domestic Dangerous Goods regulations is built in a suitable place. For safety, it is set at a sufficient distance from the refrigerated warehouse, which handles food. Taking into consideration the storage of materials, products, etc. which SEZ companies will use, the planned space is determined to be 4,600m². Basic specifications are the same as those for the dry warehouse. The assumed dangerous goods are

flammable liquids and corrosive substances, etc. such as paint or thinner.

Facility for management

The following are the facilities for management of the logistics center.

- Administration building
- Fuel station
- Transformer substation
- Car wash shop
- Container wash shop
- Inspection space
- Weighbridge
- Police station
- Fire department
- Gate
- Maintenance shop
- Sewage facility
- Waste disposal and treatment facility

Container yard

The following four elements are required for managing a container yard, carrying out planning of its physical operation, and design of facilities arrangement and cargo work system.

- + Safety
- + Simplicity
- + Flexibility
- + Cost effectiveness

A detailed explanation of the above elements is as follows.

- + Safety
 - ✓ One-way traffic as much as possible
 - ✓ Indication of handling equipment work area and external vehicle passing area
 - ✓ Security on sidewalks for laborers, staffs or other persons
- + Simplicity
 - ✓ Decrease of container cargo work contact point
 - ✓ Simplification of the container handling process
 - ✓ Simplification of work instruction system and word processing
- + Flexibility
 - ✓ Ability to respond to sudden changes in work procedure
 - ✓ Ability to respond to breakdowns of handling equipment or accidents
 - ✓ Ability to respond to mishandling

+ Cost effectiveness

- ✓ Optimal arrangement of handling equipment and workers
- ✓ Minimization of idling time for handling equipment and workers

Safety is independent from the other three factors and should be given the top priority. Even when doing so is not cost effective, safety should be ensured. The three other factors are closely related to each other. In many cases, a simple plan has flexibility and cost effectiveness and will be excellent. However, flexibility may sometimes be inconsistent with simplicity and cost effectiveness, while cost effectiveness is also often inconsistent with flexibility.

Based on the above-mentioned conditions, the proposed container yard with sufficient space allows a higher volume of container work to be carried out safely and effectively. The movement of containers between this container yard and Aktau Port should be performed by truck. Although it is possible to use rail wagons, transportation by truck is preferable because the container storage space in Aktau Port is not large and work efficiency is not good.

This yard functions not only for handling filled containers but also as a depository for empty containers (a place for returning empty containers). The following patterns of container movement via this railway terminal are assumed.

1) Discharge of filled containers from wagons

- (a) Direct container gate-out by truck to the customer (import)
- (b) Container gate-out by truck to Aktau Port for shipping (export or transit)
- (c) Cargos devanned at the internal facility and transported to the customer without containers (devanning for import)

2) Loading filled containers onto wagons

- (a) Container gate-in (carried in) by truck from Aktau Port (import or transit)
- (b) Container gate-in by truck from places other than Aktau Port (export)
- (c) Vanning at the internal facility (export)

3) Discharge of empty containers from wagons

- (a) Container gate-out (carried out) by truck to the shipper for vanning (export)
- (b) Container gate-out by truck to Aktau Port for shipping (positioning to outside the country)
- (c) Loading empty containers onto wagons after temporary storage at yard (positioning)

4) Loading empty containers onto wagons

- (a) Container gate-in by truck from Aktau Port (positioning from outside the country)
- (b) Container gate-in by truck from places other than Aktau port (Positioning)
- (c) Devanning at the internal facility (positioning)
- (d) Temporary storage at the yard after discharge from wagons (positioning)

In the current container physical distribution situation, the ratio of imports to exports is 9:1. Few forms of 1)-(b), 2)-(b), 2)-(c) and 3)-(a) are expected for the time being. Conversely, positioning work described in 3)-(b), 3)-(c) and 4) is seldom done at present due to many SOC's (Shipper's Own Containers). However, positioning work is

expected to increase accompanied by increasing number of COCs (Carrier's Own Containers) from now on. Therefore, making the positioning work smooth and systematic is the key key to physical container distribution improvement.

Estimated handling volume and size are examined as follows and the estimated volume by 2016 is responded enough.

Estimated container volume at Aktau Logistics Center

Prerequisites			
* 1.7 x number of 40'+20' = TEU			
* Annual increase rate of container = 10%			
* Av. weight per container = 15ton			
* Return rate of empty container = 60%			
	Year	2011	2016
Handling volume(ton)	SEZ	1,720,000	2,870,000
	Port	500,000	1,100,000
	City	240,000	270,000
Container ratio		10.5%	16.9%
Containerized cargo(ton)		258,300	716,560
Number of containers		17,220	47,771
TEU(Filled Import and Export)		29,274	81,210
TEU(Empty returned)		17,564	48,726
TEU total		46,838	129,936

Source: JICA Study Team

Calculation of container yard space

Prerequisites			
* Ground slot		1404 TEU	(Cs)
* Av. stacking height	export	3.5 tier	(te)
	import	2.5 tier	(ti)
	tranship	nil	
	empty	4 tier	
* Av. duration in yard	export	7 days	(De)
	import	7 days	(Di)
Max. handling throughput (A)			
$A = Cs \times \frac{2 \times 365}{\frac{De}{te} \times \frac{Di}{ti}}$			
A = 213,525 TEU			
Handling throughput as planned (At)			
At = A x 70%			
At = 149,468 TEU >129,936(Estimated)			

Formula: CONTAINER AGE, June 1991

RTG (Rubber Tired Gantry), which is so popular at the worldwide sea port terminals, is adopted as the main handling equipment. At the yard, movement of containers between rail track, container yard and warehousing facilities is performed using exclusive chassis, avoiding jams with vehicles entering from the outside and ensuring safe traffic flow. PC (Pre-Cast-Concrete) boards are used as sleepers in order to prevent pavement surface damage where the corner casting of container storage is placed. Moreover, the heavy pavement which can bear wheel loads, including a runway for RTG, is required. For night work, a lighting tower which provides sufficient light to the whole yard is installed. Size is determined at 1,404 ground slots (TEUs) based on forecast container demand. 84 electric power receptacles (400V) for reefer containers are installed at the yard.

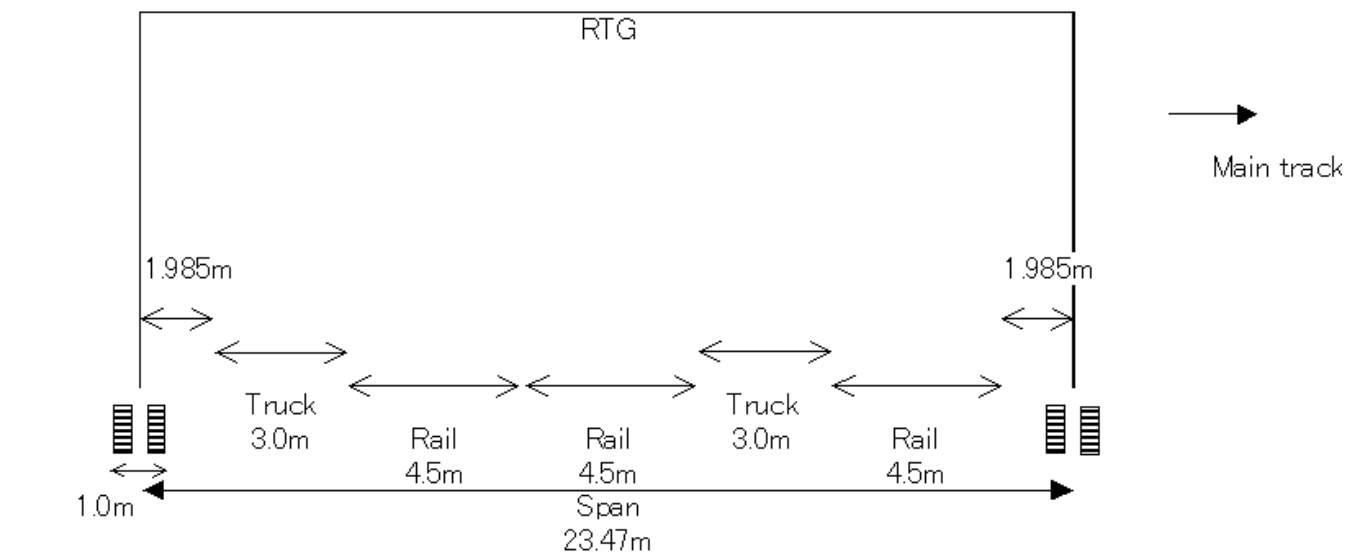


Figure 11.5-3 Container Yard

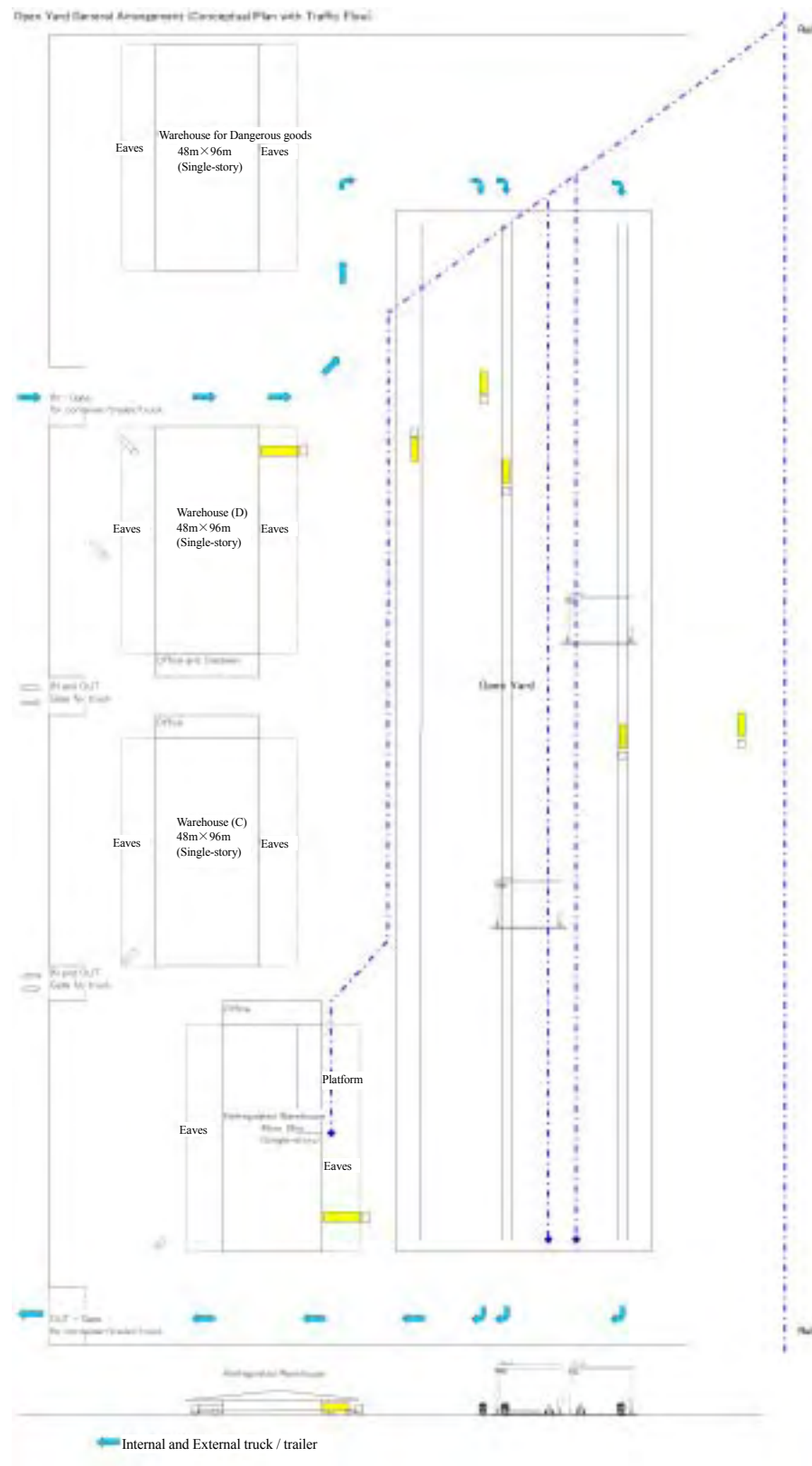
Open yard

For storage and sorting of steel products, structures, construction vehicles, heavy machinery and bulky cargos, there is an open yard with a siding track. All-over heavy pavement is recommended and considered necessary for safety. Cargo work is carried out with RTG, Reach Stackers, Forklifts and Mobile Cranes. The same lighting tower as at the container yard is installed. Although the cargo volume at the open yard is not clear since the additional building or facilities or siding can be installed in the future, the planned space is determined to be 45,000m² by the calculation in the following table. It is recommended that rail or truck use for cargo transport to/from Aktau Port be selected according to the types of cargos.

Calculation of open yard space

Prerequisites			
* Total yard space	45,000m ²	(600m x 75m)	
* Stacking density	2ton/m ²		
* Total yard capacity	90,000ton		
* Max. handling capacity	6,000ton/day	(100ton/unit/h)	
* Through ratio	30%	(from/to other SEZ)	
Estimated non-containerized cargo (ton)	Year	2011	2016
	SEZ	1,539,400	2,384,970
	Port	447,500	914,100
	City	214,800	224,370
	Total	2,201,700	3,523,440
*Most of cargos produced in other SEZ, especially steel products, are carried from/to port directly without through the open yard.			
Cargo volume through the open yard (ton)	Year	2011	2016
	SEZ	461,820	715,491
	Port	447,500	914,100
	City	214,800	224,370
	Total	1,124,120	1,853,961
1,853,961/365 = 5,080ton/day < 6,000ton/day			

Source: JICA Study Team



Source: JICA Study Team

Figure 11.5-4 Open Yard

(4) Handling Equipment

High-efficiency cargo handling equipment such as RTG for heavy cargo, and Reach Stackers and Side Lifters for empty containers, is proposed. In the wagon cargo work of RMG used as the standard in Kazakhstan, only one motion along rail track is possible since RMG unable to move in other areas lacks flexibility. On the other hand, RTG can move between the lanes or between the areas (rail track, container yard and open yard). Therefore, more efficient operation depending on cargo concentration at the yard is attained with RTG compared with RMG. Moreover, container shifting at the yard is carried out using exclusive chassis, which enables speed-up. In addition, cargo handling equipment exclusively for containers, such as Reach Stackers and Side Lifters for empty containers, is arranged.

11.5.3 Preliminary Design of Equipment

(1) RTG: Rubber Tired Gantry Crane

RTG is different from RMG which can run only on rail in a straight line. RTG can run at right angles by rotating the tire pivot 90 degrees. Therefore, it can move between work lanes and the optimal arrangement of the equipment can be performed depending on the concentration of work. Moreover, it has a telescopic type container spreader (20-foot and 40-foot convertible) and can lift containers without any help so that it can stack up to four tiers of containers at the yard. Since the operation speed is quick, a lift of about 2 minutes/container (=30 containers/hour) is possible. As a large number of RTGs have been used for many years at container terminals at ports worldwide, they have an established track record as cargo handling equipment. In addition, maintenance is easy. RTG can lift up to about 50 tons of heavy cargos other than containers by switching the spreader for heavy cargos. Since the number of tires is 16 (sixteen) and they can reduce the load per area on the yard surface compared with the 8 (eight)-tire model, this can reduce pavement reinforcement costs such as PC boards.



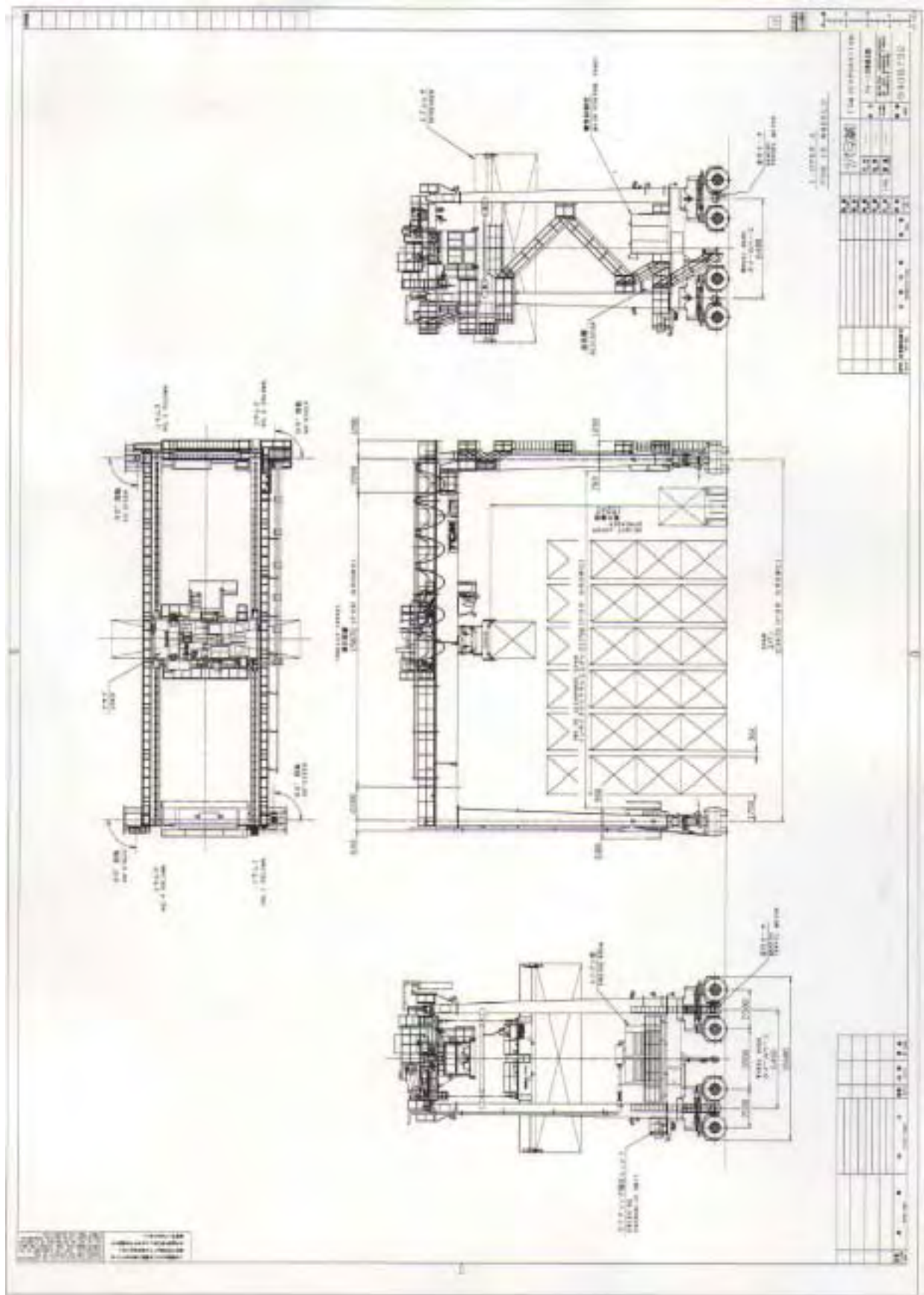


Figure 11-5-5 RTG

Rubber Tired Gantry		CT4
Performance Measure	Container Stacking Height	4 stack
	Rated Load (under spreader) t	40.6
	Max Lift Height (under spreader) m	15.24
	Speed of Hoisting (No load) m/min	54
	(Full load 40.6t) m/min	23
	Trolley Speed m/min	70
	Max Gantry Speed m/min	135
	Overall Length m	10.6
	Wheel Span m	23.47
	Wheel Base m	6.4
Tire	Size	16.00-25-28PR (tube less)
	Pressure to Pavement	7.5kgf/cm ²
	No. of Wheels	16
Engine	Type	CUMMINS 4 cycle water cooled QSX15-G3NR2
	Revolution rpm	1500
	Output Power hp	505
Generator	Type	Alternating current
	Revolution rpm	1800
	Capacity KVA	400
	Voltage V	460

Source: Japanese Manufacturer

(2) Reach Stacker

This is container handling equipment which also has a track record in Kazakhstan. Lifting capacity is 42tons with a telescopic type container spreader (20-foot and 40-foot convertible). It can be used for cargo work of not only containers but also has broad applications for break bulk cargos, long or heavy cargo, etc. (Specifications are the same as 10.6.2)



Source: Japanese Manufacturer

(3) Side Loader for Empty Containers

Generally, a COC (Carrier's Own Container) is returned as an empty container to a designated container depository specified by the shipping company after devanning at the customer's place. Since this yard also serves as a container depository, it must store empty containers. Although empty containers can be handled by RTG, empty containers cannot be stacked safely enough against strong winds. While RTG stacking generally needs a space of about 0.3m between containers, stacking empty container by side loader is effective because it does not leave any gaps between adjoining containers. Therefore, introduction of the side loader for empty container work only is proposed. The side loader is equipped with a telescopic type container spreader (20-feet and 40-feet convertible) which supports a container from one side and lifts it at two points. Four containers stacks are suitable for empty container storage. (However, a Reach Stacker could also be used for this kind of handling.)



Source: TCM

Side Loader for Empty Containers		FC70H	
		FC70H/4	FC70H/5
Performance	Max Lifting Capacity	kg	7000
	Center of Gravity	mm	1250
	Lift Height	mm	12000 (4 stack) 15300 (5 stack)
	Speed of Ascent : Full load/No load	mm/s	545/615
	Running Speed	km/h	30
	Min Turning Radius	mm	5850
Measurements	Length	mm	6430
	Width	mm	3800
	Min Height (Mast)	mm	7100 8750
	Weight	kg	39800 41300
Engine	Type	Isuzu HK1-T Diesel	
	Output Power	kW(PS)/rpm	143(195)/2200
	Volume	liter	7.79

Source: Japanese Manufacturer

(4) Small Forklift Truck

Use of small electric-powered forklift trucks in warehouses is recommended as much as possible due to environmental protection and exhaust gas reduction. (Specifications are the same as 11.6.)



Source: Japanese Manufacturer

(5) Large Forklift Truck

This should be used to handle heavy cargos such as steel products at the open yard. The same one is also used at Aktau Port. Capacity is about 24tons, and it can also be used for 20-foot container work.

Large size Diesel Forklift Truck		DIESEL
		FD240
Performance	Max Lift Capacity	kg 24000
	Center of Gravity of Cargo	mm 1250
	Lift Height	mm 3000
	Speed of Ascent : Full load	mm/s 330
	Running Speed	km/h 34
	Min Turning Radius	mm 5900
Measurements	Length	mm 8750
	Width	mm 3070
	Height (Mast)	mm 3750
	Weight	kg 34150
Engine	Type	Mitsubishi 6D24T Diesel
	Volume	cc 11940
	Output Power	ps/rpm 224/2100



Source: Japanese Manufacturer

(6) Mobile Crane

To handle heavy cargos exceeding the lifting capacity of RTG, a mobile crane with larger capacity (about 70tons) is available. It is mainly used in the open yard. The tire type (not caterpillar) is more convenient for movement within the yard or outside. This could be considered as cargo handling equipment at Aktau Port and for combination use. A crane with 130ton capacity is shown below for reference. (Specifications are the same as 11.6.)



Source: Japanese Manufacture

(7) Yard Tractor

This is exclusively used for movement at yards. It is widely used in Kazakhstan, including Aktau Port. The yard container chassis or low-bed trailer shown below are connected and they carry containers or cargos. Traction power is strong and low-speed operation is good for safety.



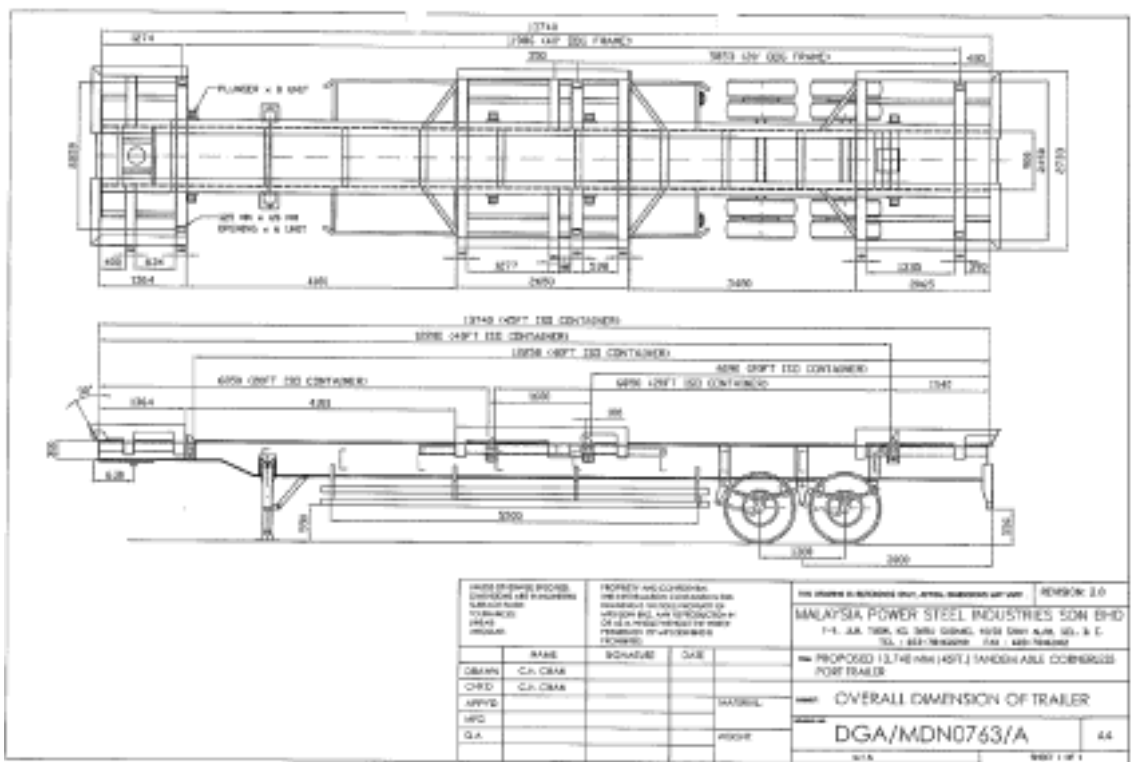
Source: Kalmar

Model Number	Drive Number of gears (F+R)	Power Torquer (kW-rpm) (kN-rpm)	Tires	Lifting capacity (kg)	Turning radius (mm)	Lenght Width (mm)	Weight (kg)	Typical Application
ST122	4x2 4F+1R	129kW-2200 800Nm-1500	11.00-R22.5	25000	6,580 mm	5644x2624	6800	Distribution centers of various kinds, warehousing, distribution centres, road legal trailer moving.
PT122	4x2 4F+1R	129kW-2200 800Nm-1500	11.00-R22.5	5th. Wheel Table capacity 32 000 (Lifting 5th. Wheel capacity 28 000 - as option)	5,280 mm	4689x2591	6600	Container terminal operation, often with bumcar trailers

Source: Swedish Manufacturer

(8) Yard Container Chassis

This is connected to a yard tractor and used for container movement at the yard. The loading capacity is 60tons. It can load 2 x 20-feet or 1 x 40-feet container. Storing a separated tractor is also possible. In many cases, it is usually used for storage of OOG (Out Of Gauge) containers. Moreover, it is used for on-docking at the warehouse mouth.

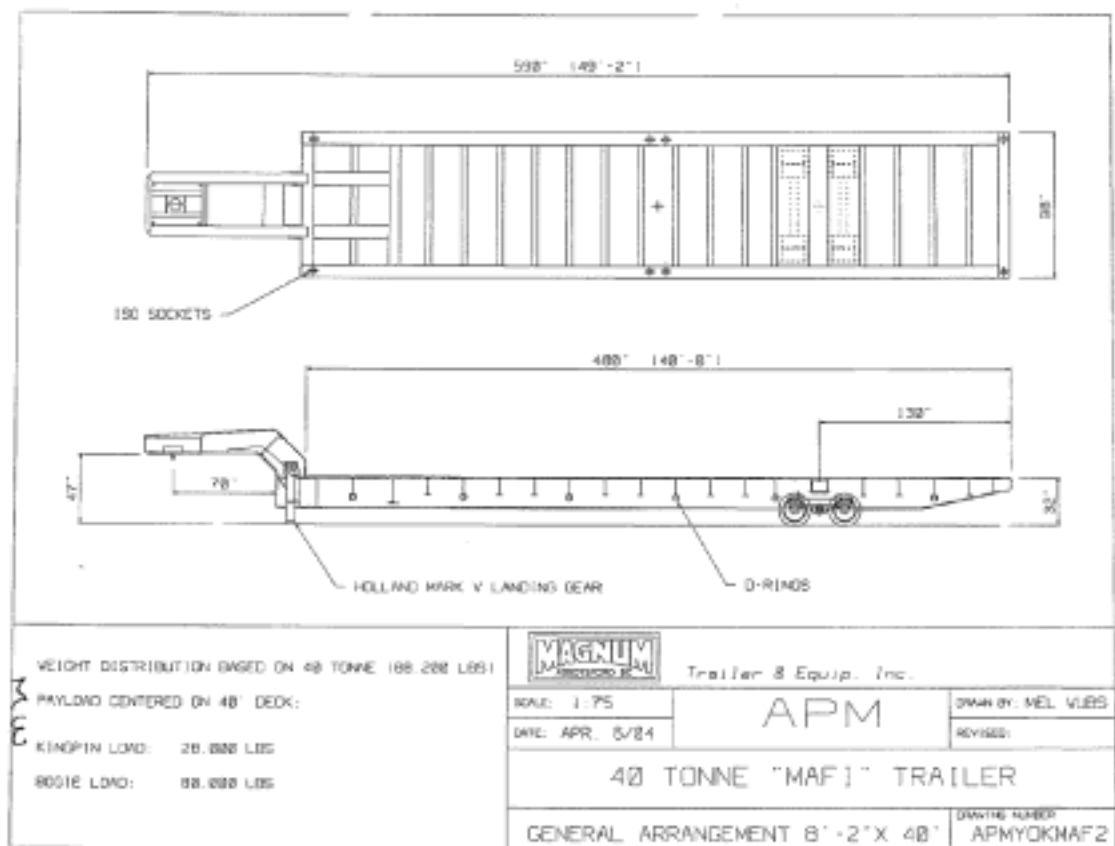


Source: Malaysian manufacturer

(9) Low Bed Trailer

This is connected to a yard tractor and used for heavy or bulky cargo movement at the yard. Although there are many types, the example below has a capacity of 40tons.





Source: US manufacturer

11.5.4 Information and Communication Systems

Basically the same concept as at Dostyk is considered. But the site is located inside the planned SEZ which will have factories, information centers, terminals and warehouses as part of the logistics center. Therefore, there may be some more concerns here. However, this study on information and communication systems in Aktau is limited to facilitation for the logistics center.

1. External network connection by fiber optic cable or satellite communication network will be provided by SEZ for all tenants.
2. Infrastructure requirements are the same as those in the case of Dostyk except for the difference in the necessary number of units because of the size of the operation and number of staff.
3. The same software as that at Dostyk or other terminals can be used. Development cost is calculated similarly to the section for Dostyk.
4. A minimum office administrative application system such as HR, accounting, payroll should be implemented.

1) Hardware / netware configuration

LAN between buildings is connected by cable. This is installed together with other utilities inside the underground conduits.

Proposed configuration is shown in Figure 11.5-6.

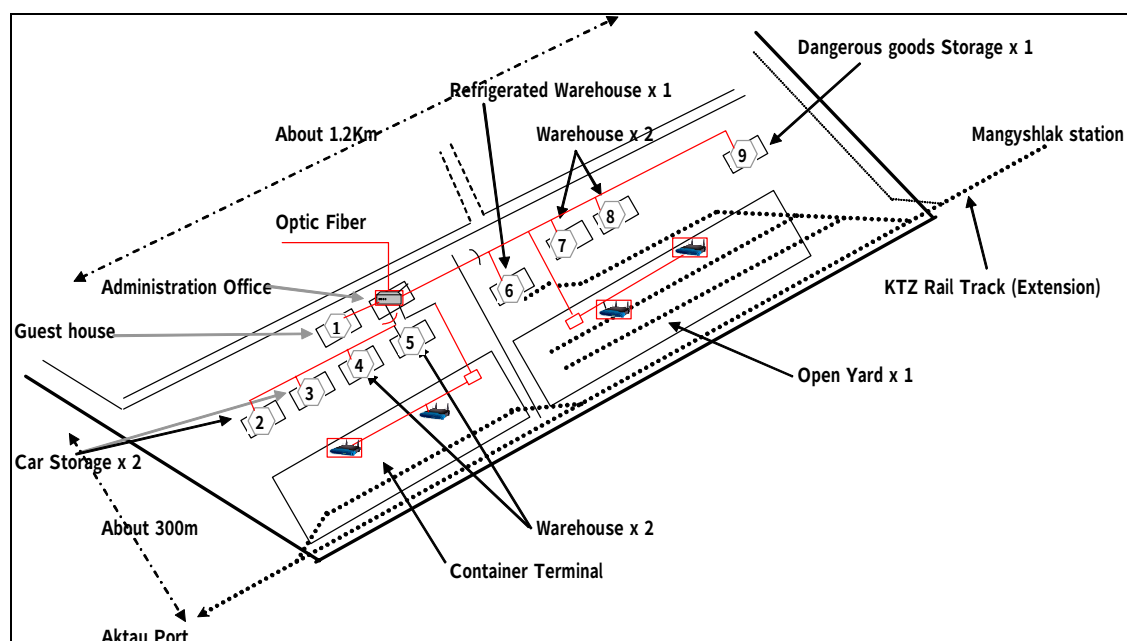


Figure 11.5-6 Network Configuration at Aktau Logistics Center (Phase I)

2) Cost

The estimated cost and the equipment list are shown in Tables 11.5-1 and 11.5-2, respectively. Though the software has to be developed, the corresponding cost is calculated as part of the cost for the Dostyk terminal.

Table 11.5-1 Cost Summary

(Unit: KUS\$)

Category	Items	Cost
Hardware	Terminal Servers / Other servers / PCs / Printers / WiMAX / WiFi / PDAs / Cables / Hub/Modems	303
Software development & installation	Implementation	120
Total		423

Table 11.5-2 Equipment List

	Facility	Number	Unit Price (in US\$)	Price (KUS\$)	Remarks
Administration Office					
	Router	1	50,000	50	
	NT server	1	50,000	50	
	Office server	3	10,000	30	Mail, DHCP, etc
	Other Application Server	3	5,000	15	HR, AC, PR
	8 Port Hubs	2	100	0.2	
	PC	5	1,800	9	
	Printer	3	200	0.6	
		3	200	0.6	
1 - 9					
	8 Port Hubs	9	100	0.9	
	PC	18	1,800	32.4	
	Printer	9	200	1.8	
Container Terminal					
	8 Port Hubs	2	100	0.2	
	Handy Terminals	20	1,800	36	
	PC	2	1,800	3.6	
	Printer	2	200	0.4	
	Wireless Router	2	100	0.2	
Open Yard					
	8 Port Hubs	2	100	0.2	
	Handy Terminals	20	1,800	36	
	PC	2	1,800	3.6	
	Printer	2	200	0.4	
	Wireless Router	2	100	0.2	
Cable		2500m	3	7.5	
Spare					
	8 Port Hubs	2	100	0.2	
	Handy Terminals	10	1,800	18	
	PC	3	1,800	5.4	

11.6 Construction Plan and Cost Estimate

11.6.1 Construction Plan

The construction of Aktau Logistics Center is planned to be completed within four years based on the Plan.

First, improvement of the soil is to be carried out by exchanging the soft ground for new suitable soil mixed with cement. This work is scheduled to take two years and a half till 2010.

The construction of a flyover road for access to the Aktau Logistics Center is scheduled to be carried out in parallel with soil improvement and completed by 2009.

After completion of soil improvement, the railway yard and other railway facilities are scheduled to be completed in 2010.

Other facilities in the container and common management areas are scheduled to be constructed within two years till 2011, as shown in Table 11.6-1.

Table 11.6-1 Aktau Construction Schedule

[illegible]

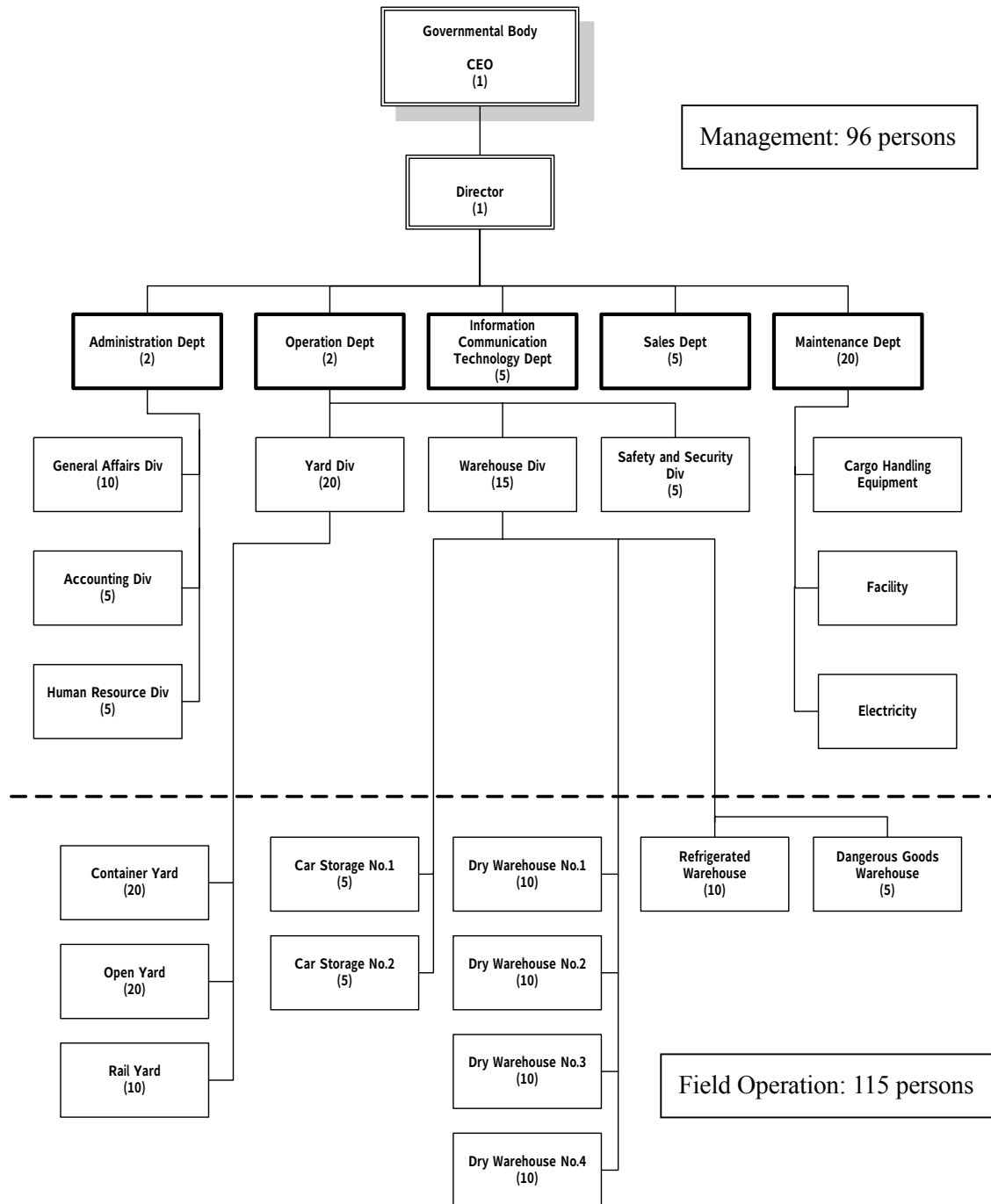


Figure 11.6-1 Organization for Management & Field Operation (Total : 211 persons)

11.6.2 Management Plan

The organization and management framework of the Aktau Logistics Center is proposed as follows.

(1) Subject of Management

Although the development of the Aktau Logistics Center is managed by Mangystau oblast (Akimat) now, another management body is expected to be established and actually run the center after completion. Detailed information is unknown at this stage.

(2) Organization

The assumed new management body is shown in Figure 11.6-1. The number of personnel in each department is estimated according to the planned facility and throughput forecast in the year of 2016.

(3) Management Framework

In the management framework, two special departments of Information Communication Technology and Safety and Security are arranged for the necessary functions of a modern logistics center. Moreover, sales activities to expand markets should be continued after completion. The sales department is independent from the others. Periodic maintenance work for equipment, facilities, containers and wagons is carried out by the maintenance department and controlled effectively. In the field operation, the maximum number of persons is an estimate, since the shift schedule or working time period is not fixed.

11.6.3 Cost Estimate

(1) Land Acquisition

1) Planned area (Phase I)	100ha
2) Area for future construction	100ha
3) Buffer area	5ha
4) Right of way for railway	5ha
5) Access road	15ha
Total	225ha

(2) Breakdown of Planned Area (Phase I) 100 ha

1) Railway management area (Loading and unloading, drill track, arrival and departure track, etc.)	17ha
2) Container management area	60ha
3) Common management area	9ha
4) Railway main line	5ha
5) Road	9ha

(3) Area of Each Facility

1) Railway management area

- a) Railway 7,200m
- b) Building (First floor) 250m²
- c) Pavement $(1400 \times 6) + (600 \times 10) = 14,400\text{m}^2$
- d) Fence (h=2m) $(40\text{m} \times 2) + (1400) = 2,200\text{m}$
- e) Pedestrian bridge (h=6) $(2.5\text{m} \times 46\text{m}) + (1.5 \times 24\text{m}) = 151\text{m}^2$

2) Container management area

- a) Building (area of first floor) 29,000m²
- b) Pavement $498,800 - 29,000 = 469,800\text{m}^2$
- c) Other area 14,500m²
- d) Fence (C.W ,H=2m) $(290\text{m} \times 2) + 1,200\text{m} = 1,780\text{m}$

3) Common management area

- a) Building (area of first floor) $(20 \times 64) + (18 \times 64) = 2,432\text{m}^2$
- b) Pavement $(50 \times 500) - (2,432 + 6,000) = 16,568 = 16,500\text{m}^2$
- c) Other area $40 \times 150 = 6,000\text{m}^2$
- d) Fence (C.W ,H=2m) $(50\text{m} \times 3) + 65\text{m} = 215\text{m}$

4) Access road 3,000m x 10m = 30,000m²

- a) Flyover bridge 1 place
- b) Exchange of soil $1.5 \times 1000000 = 150,0000\text{m}^3$
- c) Land acquisition 225,0000m²

(4) Construction Cost**Table 11.6-2 Cost Table of Aktau (excluding equipment cost)**

Railway management area				
Name	Unit	Quantity	Unit cost	Cost (KZT)
Rail track	m	7,200	12,600	90,720,000
Switch	set	21	4,185,000	87,885,000
Signal and telecom.	set	1	50,000,000	50,000,000
Building	m2	637	154,000	98,098,000
Pavement	m2	14,400	3,500	50,400,000
Utility	m2	14,400	2,000	28,800,000
Fence	m	2,200	1,000	2,200,000
Pedestrian bridge	m2	151	80,000	12,080,000
Subtotal				420,183,000
Container management area				
Name	Unit	Quantity	Unit cost	Cost (KZT)
4 Warehouse Type A	m2	24,482	56,500	1,383,233,000
2 Warehouse Type B	m2	31,164	56,500	1,760,766,000
1 Warehouse Type C	m2	5,180	56,500	292,670,000
Fire station	m2	430	56,500	24,295,000
Fuel stand	m2	450	56,500	25,425,000
Maintenance shop	m2	1,411	56,500	79,721,500
2 Guard office	m2	168	56,500	9,492,000
Pavement	m2	469,800	3,500	1,644,300,000
Utility	m2	469,800	2,000	939,600,000
Other area	m2	14,500	1,000	14,500,000
Fence	m	1,780	3,000	5,340,000
Subtotal				6,179,342,500
Common management area				
Name	Unit	Quantity	Unit cost	Cost (KZT)
Administration office	m2	3,435	56,500	194,077,500
Guest house	m2	3,825	154,000	589,050,000
Pavement	m2	16,500	3,500	57,750,000
Utility	m2	16,500	2,000	33,000,000
Others	m2	6,000	3,000	18,000,000
Fence	m	215	8,000	1,720,000
Subtotal				893,597,500
Name	Unit	Quantity	Unit cost	Cost (KZT)
Access road	m2	30,000	7,000	210,000,000
Flyover bridge	Lump sum	1	150,000,000	150,000,000
Exchanging of soil	m3	1,500,000	2,500	3,750,000,000
Land acquisition	m2	2,250,000	100	225,000,000
Subtotal				4,335,000,000
Total				11,828,123,000

Information and Communication System

Category	Items	Cost (KZT)
Hardware	Terminal Servers, PCs, PDAs, etc.	36,360,000
Software development and installation	Implementation	14,400,000
Total		50,760,000

(KZT)

Table 11.6-3 Cost Table of Equipment (Aktan)

Name	model	capacity	required uni	unit price(tg)	ammount(tg)	location	life span	annual maintenance cost(tg)
RTG	CT4W	40t	4	140,000,000	560,000,000	Yard	15 years	4,000,000
Reach stacker	MR420/4	42t	2	60,000,000	120,000,000	Yard	15 years	3,000,000
Side loader for empty	FC70H/4	7t	1	25,000,000	25,000,000	Yard	15 years	2,000,000
Fork lift(electric)	FB15-7	1.5t	14	2,000,000	28,000,000	Refrigerator, Warehouse	10 years	200,000
Fork lift(electric)	FR15-7H	1.5t	8	2,000,000	16,000,000	Refrigerator, Warehouse	10 years	200,000
Fork lift(diesel)	FD25C3	2.5t	8	2,000,000	16,000,000	Warehouse	15 years	300,000
Fork lift(diesel)	FD240	24t	1	30,000,000	30,000,000	Yard	15 years	600,000
Mobile crane	KA-1300	130t	1	150,000,000	150,000,000	Yard	15 years	2,000,000
Yard tractor	PT122	32t	8	10,000,000	80,000,000	Yard	10 years	600,000
Yard chassis		60t	12	3,000,000	36,000,000	Yard	15 years	100,000
Lowbed trailer		60t	1	5,000,000	5,000,000	Yard	15 years	50,000
Total					1,066,000,000			13,050,000

11.7 Environmental and Social Considerations

11.7.1 Legal Framework Related to Environmental and Social Considerations

Q.v. 10.8.1

11.7.2 Present Condition of Environment of Project Site

(1) Present Conditions of Social Environment

1) Resettlement inhabitants

The project site is a vast flat vacant area. There are no dwellings on the project site.

2) Economic activity

Factories, a power plant and transportation facilities, etc. are scattered around the project site. There are activities that relate to industry and transportation, etc. around the site area.

3) Traffic/public facilities

The railway is adjacent to the project site. This is a freight route that KTS manages. Roads are in the directions of north, south, east and west.

4) Community division

No community exists on the project site.

5) Cultural property

There are no residents on the object ground. Moreover, no group with special cultural characteristics exists. No historical cultural heritage exists.

6) Water use rights and common use rights of common

The project site is under the management of Mangystau Oblast Akimat.

7) Waste

There are disposal sites for solid wastes in Mangystau Oblast. This also exists in Actau. However, the present disposal system is not considered enough. Moreover, there are illegal disposal sites.

(2) Present Condition of Natural Environment

1) Topography and soil conditions

The project site is flat ground near the Caspian Sea. The ground is generally dry. But there are many puddles in the area near the seacoast. Regarding the soil stratum, there is a sand layer deposit from the earth surface to a depth of about 4m. The next layer is mainly composed of clay deposits from 4m to 9m in depth. Marl and limestone deposits are found in the layer under that. The overall ground is solid though the second layer is a little soft.

2) Soil erosion

Swamps are formed in spots at wet places around the project site. However, most of the earth surface is exposed and herb plants are scattered because the climate is dry. Thus, natural influence is greater than artificial influence on soil erosion as a result of such a situation.

3) Hydrological regime

Some ponds exist around the project site. The ponds at the corner of the project site are not always filled with water, and the water disappears in August. On the other hand, there is a large pond in the southeast direction of the project site, and this pond is always filled with water.

4) Coastal zone

The Caspian Sea is located in the southwest direction of the project site. However, it is far away from the project site.

5) Fauna and flora

Neither nature reserve nor natural park, etc. exist around the project site. However, hydrophytes grow in the big pond located in the southeast direction of the project site and a lot of aquatic birds live there. This is a stopover place of migratory birds (flamingos).

6) Meteorology

The climate in this region is a continental climate because it is far away from the Atlantic Ocean and the Pacific Ocean. The Caspian Sea does not influence the climate so much. The temperature falls normally to -26°C in January. The normal temperature in July and August is 23°C . The average amount of precipitation is 156mm a year and it is a dry region. There is not much snowfall; it only snows 13 days a year.

7) Landscape

Most landscape of the project site is open smooth ground. Besides this, there is industrial landscape around the project site. There are harbor facilities in the vicinity of Aktau Port. Housing landscape is seen around Aktau urban area in the west. Natural landscape in the wetland is seen in the southwest direction of the project site.

(3) The Present Condition of Pollution

1) Air pollution

The quality of the atmosphere has been measured in urban and industrial areas of Mangystau oblast. SS exceeds the maximum tolerance limit (MAC) in Aktau. Compound air pollution index (API5) for Aktau is lower than the average of other measured sites in Kazakhstan. The main factor of pollution is assumed to be the chemical industry in Aktau.

2) Water pollution

The land surface water of Aktau is in generally excellent condition.

3) Soil contamination

Samples of heavy metal in the soil (cadmium, lead, copper, chrome, and zinc) have been gathered in various regions in Mangystau Oblast. The measured contamination level in Aktau is lower than the control standards.

4) Noise and vibration

The factors generating noise and vibration are automobile traffic and railway, etc. around the project site.

5) Land subsidence

Regarding the soil stratum, there is a sand layer deposit from the earth's surface to the depth of about 4m. The layer is composed mainly of clay deposits from 4m to 9m in depth, with marl and limestone deposit in the layer under that. The overall ground is solid though the second layer is a little soft. Therefore, subsidence will not become a problem.

6) Offensive odor

No offensive odors are detected around the project site.

11.7.3 Comparison of Alternatives

Alternatives of the project plans were examined from the viewpoint of impact on the environment (Table 11.7-1). They are as follows.

Case1: Logistics center in special economic zone (about 2km east) near Aktau Port

Case2: Logistics center in special economic zone (about 14km north) located far from Aktau Port

The characteristics of the plans are as follows.

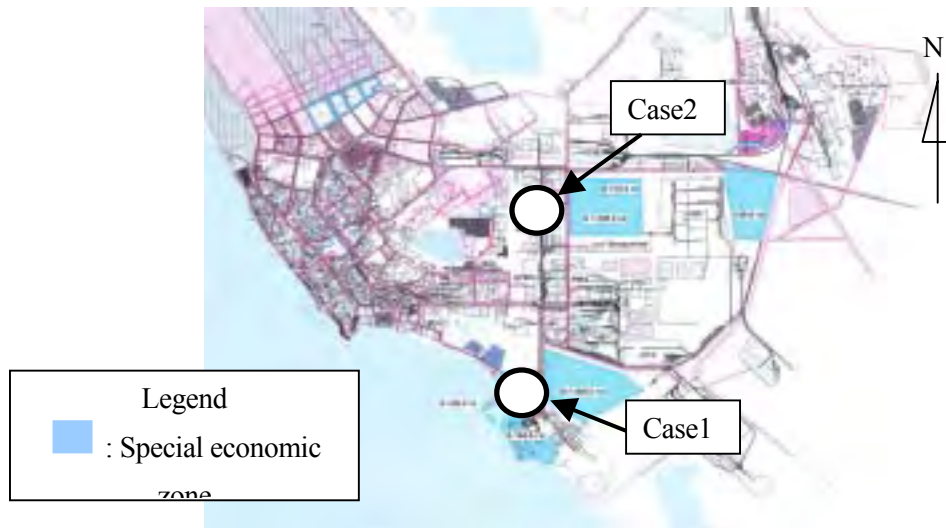


Figure11.7-1 Location of Alternatives

The region around the special economic zone is composed of vast vacant land, an industrial area, etc. There are only scattered dwellings. Therefore, the environmental impacts of both Case 1 and Case 2 are small.

The ground level for Case 1 is lower than that of the surroundings. Case 1 needs soil moved and filled. Therefore, there would be little soil carried out from this area. The impact of Case 1 is low from the viewpoint of waste and soil contamination.

No new influence will be exerted on the environment if the project is not executed. However, from the viewpoint of economic activation, there would be more benefit from implementing the project than not carrying it out.

Generally, the environmental impacts of Case 1 are smaller than those of Case 2.

Based on this result and other considerations such as logistics efficiency, Case 1 was adopted.

Table11.7-1 Environmental Impact Items

Environmental items			Contents	Alternatives		Note
				Case 1	Case 2	
Social environment	1	Resettlement inhabitants	Resettlement accompanied by site possession (transfer of residence right and land ownership right)			No dwelling around either project site
	2	Economic activity	Loss of land or other production opportunities, change in economic structure			A positive influence is expected.
	3	Traffic/public facilities	Impacts on traffic congestion, accidents, and other transportation conditions and impacts on schools, hospitals, etc.			
	4	Community division	Division of local society due to traffic obstructions			
	5	Cultural property	Loss of shrine and temple/buried cultural property, etc. and their depreciation in value.			
	6	Water use rights and common use rights	Obstruction to fishing rights, water use rights, common use rights of mountains and forests			
	7	Public health conditions	Deterioration of healthy environment due to discharge of waste and harmful insects			
	8	Waste	Construction waste, waste dumps, solid waste, etc.		△	There is more surplus soil in Case 2 than in Case 1.
	9	Hazards	Increase of landslides, cave-ins, accidents, etc.			
Natural environment	1	Topography and soil conditions	Alteration of valuable topography and soil condition by excavation and embankment			
	2	Soil erosion	Topsoil erosion due to precipitation following land reclamation or forest clear cutting			
	3	Groundwater	Water shortage caused by excessive pumping or pollution due to exuded water			
	4	Hydrological regime	Change in riverbed and flow volume due to land reclamation or drainage flow			
	5	Coastal zone	Change in coastal fauna and flora and coastal erosion due to changing ocean conditions			
	6	Fauna and flora	Extinction of species and breeding obstruction due to changing habitat conditions			
	7	Meteorology	Change in temperature and wind conditions due to large-scale reclamation and buildings			
	8	Landscape	Topography change due to land reclamation and obstruction of views due to the presence of structures			
Pollution	1	Air pollution	Pollution due to harmful gases, exhaust from vehicles and plants	△	△	Increase of car traffic according to use of facilities, increase of construction vehicles during construction.
	2	Water pollution	Pollution due to inflow of sand, plant discharge, etc.	△	△	Generation of dirty water due to construction
	3	Soil contamination	Contamination due to outflow and dispersion of drainage, harmful substances		△	There is more surplus soil in Case 2 than in Case 1.
	4	Noise and vibration	Noise and vibration made from operation of vehicles, train yard, etc.	△	△	More car traffic due to use of facilities, more construction vehicles
	5	Land subsidence	Subsidence of land surface accompanied with changes in topography or a drop of ground water level			
	6	Offensive odor	Discharge of exhaust gas and offensive odors			
○ : There is an impact (comparatively large). △ : There is a small impact (comparatively small).						

Source: JICA Study Team, based on Screening format, JICA 1994

11.7.4 Scoping

Scoping on the environmental impacts of the project (Case 1) was carried out and the evaluation items were extracted (Refer to Table 11.7-2). The reasons were also given.

"Air pollution", "Water pollution" and "Noise vibration" are given as items whose influence should be considered. It was judged that the other items do not require evaluation.

Table 11.7-2(1) Scoping of Environmental and Social Considerations

Environmental items			Rate	Note
Social environment	1	Resettlement inhabitants	D	No dwellings exist on the project site. Therefore, resettlement inhabitant does not require assessment.
	2	Economic activity	D	New construction and operation of the logistics center vitalizes the surrounding area's economy.
	3	Traffic/public facilities	D	The project site does not impede access to the public facilities, so there are few elements that influence existing traffic and public facilities in a new way.
	4	Community division	D	The project site does not divide the community. Therefore, community division does not require assessment.
	5	Cultural property	D	There is no cultural heritage around the project site.
	6	Water use rights and common use rights of common	D	The project site is located in the special economic zone and there is no problem of water use rights and rights of common.
	7	Public health conditions	D	This project does not influence sanitation.
	8	Waste	D	The ground level of the project site is lower than that of the surroundings. Soil transport and embankment are carried out. Therefore, little soil will be carried out from this region. The influence of the project is minor from the viewpoint of waste.
	9	Hazards	D	As geographical features are smooth, it is assumed that no landslide disasters will occur. There is no river around here. It is assumed that no flooding disasters will occur.

Source: JICA Study Team, based on Scoping format, JICA 1994

Table 11.7-2(2) Scoping of Environmental and Social Considerations

Environmental items		Rate	Note
Natural environment	1	Topography and soil conditions	D The project site is located on a flat plain. Therefore, there are no worthy geographic or geological features. There are depressions in this region and they are puddles. A sand layer deposit extends from the earth surface to about 4m depths in the soil strata. A layer mainly composed of clay deposits is between 4m-9m in depth, with marl and limestone deposits in the layer under that. The ground is generally solid though the second layer is relatively weak. Therefore, it is believed that there are few influences on geographical and geological features.
	2	Soil erosion	D The ground surface in the project site is exposed and herb plants are scattered. Therefore, soil erosion will not become a new problem by executing the project.
	3	Groundwater	D In the present facility plan, there is no factor to influence underground water.
	4	Hydrological regime	D Some ponds exist around the project site. The pond at the corner of the project site is not always full. On the other hand, there is always water in the big pond in the southeast direction of the subject ground. There are no factors influencing the flow of water by the present planned facilities.
	5	Coastal zone	D The Caspian Sea is located in the southwest direction of the project site. However, it is far from the subject ground. Therefore, there is no influence.
	6	Fauna and flora	D No nature preservation area exists around the project site. However, hydrophytes grow around the large pond located in the southeast direction of the subject ground and many birds live there. It is a stopover place for migrating flamingos. But the project site is far from the pond. Therefore, the project does not influence the flora and fauna.
	7	Meteorology	D It is believed that the project does not especially influence the weather, based on the contents of the project.
	8	Landscape	D The landscape of an industrial site are already formed around the project site. Therefore, the influence on landscape with the facility construction is minor.

Source: JICA Study Team, based on Scoping format, JICA 1994

Table 11.7-2(3) Scoping of Environmental and Social Considerations

Environmental items			Rate	Note
Pollution	1	Air pollution	B	Vehicle traffic will increase with the use of facilities, and there will be an increase of construction vehicles. Therefore, a few negative influences are assumed.
	2	Water pollution	B	The planned facilities are not of the type to exert a major influence on the water quality. Dirty water may be generated with construction, because the underground water level is perhaps high.
	3	Soil contamination	D	The ground level in the project site is lower than that of the surroundings. Soil is carried to the project site under construction. Therefore, there will be little surplus soil carried out from this region. Accordingly, the possibility of contaminated soil diffusion is probably small.
	4	Noise and vibration	B	Vehicle traffic will increase with the use of facilities, and there will be an increase of construction vehicles. Therefore, a few negative influences are assumed.
	5	Land subsidence	D	A sand layer extends from the earth surface to the depth of about 4m concerning the soil stratum. A layer mainly composed of clay deposits is 4m-9m in depth, with marl and limestone deposits in the layer under that. The overall ground is solid though the second layer is relatively weak. Therefore, it is believed that land subsidence will not occur.
	6	Offensive odor	D	Judging from the content of the project, it will not produce any new offensive odors.
Comprehensive evaluation				Judging from the characteristics of the planned facilities, no elements that exert a serious negative influence on natural and social environment have been found. Items requiring consideration are air pollution, water pollution, noise and vibration. These items should be taken into consideration, though these influences are perhaps small.
Division of rating A: A major negative impact is expected. B: A minor negative impact is expected. C: The impact is uncertain at the present stage. D: No further examination required.				

Source: JICA Study Team, based on Scoping format, JICA 1994

The Environmental Protection Agency in the oblast is in charge of environmental assessment permission procedures in Kazakhstan. The executing organization submits the document to the Environmental Protection Agency in the oblast and follows the procedure. The Aktau area is under the jurisdiction of the Environmental Protection Division in Mangystau Oblast, based in Aktau. The permission procedure for environmental assessment requires four months or less. The period of the investigation is not included in this. The survey organ that has obtained special authorization executes the investigation.

11.7.5 Initial Environmental Examination (IEE)

(1) Forecast and Evaluation

In Scoping, the environmental items requiring examination are extracted. The levels of influence on these items were arranged in Table 11.7-3.

Table 11.7-3 Result of Forecast and Evaluation

Environmental items	Forecast and Evaluation
Air pollution	It is assumed that the traffic volume of containers and freight will increase with the project. Therefore, the number of vehicles will increase and the project will influence the atmosphere. The number of construction vehicles will increase around the project site under construction. Therefore, the construction influences the atmosphere. However, dwellings are limited to a part of the region outside the project site and are away from the project site. Some negative influences are assumed as vehicle traffic increases and the number of construction vehicles increases. However, the influences can be lessened by taking appropriate measures.
Water pollution	The planned facilities are not of the type to exert a major influence on the water quality. There is a possibility that excavation under construction may generate dirty water, because the underground water level may be high at the project site. However, disposal measures can decrease the influence on the environment. Though some negative influences are assumed as dirty water is generated, the impact is probably minor.
Noise and vibration	It is assumed that the material flow of containers and freight will increase with the project. Therefore, there will be vehicle traffic and the project may generate make noise and vibration. The number of construction vehicles will increase around the project site under construction. Therefore, the construction will perhaps make noise and vibration. However, dwellings are limited to a part of the region outside the project site and are far from the project site. Although there may be some negative influence due to the increase of vehicle traffic and construction vehicles, this can be lessened by taking appropriate measures.

Source: JICA Study Team

The construction of an access road and railway may be executed in the future. At that time, there could be some influence on the environment. As this region is almost composed of open ground and factory sites, etc., the influence is perhaps small. But, sufficient considerations are necessary for alignment plans of road and railway.

(2) Integrated evaluation

Judging from the characteristics of the planned facilities, no elements exerting a serious negative influence on the natural and social environment were found.

There are air pollution, water pollution, noise and vibration as items requiring consideration.

In the logistics center operation, the influences by air pollution, noise and vibration are not major problems because the project site is far from dwellings. However, it is necessary to consider them.

The influences during the construction are temporary and not large. They can be reduced by adopting an appropriate construction plan.

11.7.6 Environmental Management plan: Monitoring and Remediation

(1) Remediation Process

There are open ground and some industrial facilities, etc. around the project site. Therefore, it is believed that there are few influences on residents.

Environmental impacts of air pollution, noise and vibration can be decreased further by setting appropriate routes for vehicles during construction and operation.

It is necessary to select an appropriate disposal method of the dirty water under construction considering the influence on the environment. It is believed that a water treatment plant can decrease the environmental impact further.

(2) Monitoring Plan

When EIA is executed in accordance with the procedure of Kazakhstan, the implementing organization will execute the monitoring according to the environmental protection code in Kazakhstan. It is hoped that the monitoring will be executed concerning the items shown in the above-mentioned environmental improvement plan. It is hoped to confirm concerning routes of vehicles and the disposal method of the dirty water.

11.7.7 Conclusion and Recommendation

Judging from the characteristics of the planned facilities, no element exerting a serious, negative influence on the natural and social environment is found.

Some influences generated during construction are temporary and not major.

However, enough concern for the environment is necessary, in particular about the operation vehicle routes in the operation. Moreover, a railway plan taking the environment into consideration will be necessary in the future.

11.8 Economic and Financial Analysis

11.8.1 Economic Analysis

(1) Objective and Methodology of Analysis

The objective of the economic analysis is to analyze and evaluate the viability of implementing this project from the viewpoint of the national economy in Kazakhstan.

Comparative analysis of investment costs and benefits in the case of both executing the project ("With the project") and not executing the project ("Without the project") is carried out.

As the evaluation criteria, Economic Internal Rate of Return (EIRR), Benefit and Cost Ratio (B/C Ratio) and Net Present Value (NPV) are applied. They are explained as follows.

(2) Economic Internal Rate of Return (EIRR)

The EIRR is the discount rate which makes the investment cost and the benefit calculated in the net present value equal. It is calculated with the following formula.

$$\sum_{t=0}^n \frac{(B_t - C_t)}{(1 + EIRR)^t} = 0$$

Where n : The period for the analysis (first year t = 0)
 B_t : The benefit of each year
 C_t : The difference of investment cost and operation cost between
 "With the project" and "Without the project" in each year

(3) Benefit and Cost Ratio (B/C Ratio)

B/C is a ratio found from the net present value of the benefit divided by that of the cost. The benefit of the project is evaluated from the value of this ratio; if this ratio is higher than 1.00 with the designated discount rate, this project is considered to be socially and economically viable. The social discount rate to be applied for the evaluation of B/C Ratio is normally decided by the opportunity cost in the country concerned. In this project, the social discount rate of 12% is adopted referring to those of the International Bank for Reconstruction and Development (IBRD) and Asian Development Bank (ADB).

(4) Net Present Value (NPV)

Net present value is the future value expressed in present value through being discounted by the social discount rate.

(5) Premises

In this study, the analysis is carried out based on the following premises.

1) Price

In general, all costs are classified into a tradable group (imported products) and a non-tradable group (domestic products and personnel expenses). To estimate the economic price, all transfer items such as taxes, duties and subsidies shall be deducted from the viewpoint of the national economy.

The economic prices for imported products are used as CIF (Cost, Insurance and Freight) prices, which represent border prices without import duties, plus inland transportation costs and other fees. The customs tariff rates of import goods are from 0 to 30%.

On the other hand, those for domestic products are estimated by deducting Value Added Tax (VAT) and other taxes from their market prices. To calculate the economic prices, VAT 14% is adjusted from each market price.

Similarly, the economic prices of the personnel expenses are estimated by deducting personal income tax. In this study, the rate of taxes borne by income taxpayers is assumed as 10%.

As to Standard Conversion Factor (SCF) to convert the domestic price to the border price level, SCF between 0.95 and 1.00 has been applied in previous studies on infrastructure projects in Kazakhstan. Consequently, the SCF for this analysis is assumed to be 1.00.

All the prices used in the analysis are based on the year 2007.

2) Exchange Rate

The exchange rates used in the study are assumed to be KZT120.23 to USD1.00 and JPY120.73 to USD1.00 as a mean value of May 2007.

3) Inflation

Since it is difficult to estimate the inflation rate during the whole period of the project, it is not taken into consideration in the analysis. All the figures are based on constant prices in the year 2007.

4) Project Life for the Analysis

The period of the analysis is set for 32 years including the construction period from April 2010 to March 2012 and 30 years operation from April 2012 to March 2042. The construction period of the access road, flyover bridge and soil exchange & improvement from 2008 to the middle of 2010 is not taken into consideration. In the analysis, each project year is considered to begin in April and end the following March.

5) Service Lives of the Assets

As for the service life cycle of facilities with proper maintenance, the following periods of durability are presumed shown in Table 11.8-1. All facilities invested in the project will be considered new assets.

Table 11.8-1 Useful Lives of Assets

(Unit: years)

Item	New Assets	Revalued Assets
Buildings and construction	20-45	12-18
Rail track infrastructure:		
Land improvement	80	43-51
Railway tracks and infrastructure	20-45	10-26
Engineering construction, pipelines	20-45	14-18
Cable, electrical and telecommunication networks	10-25	9-13
Transport, machinery, equipment and others:		
Wagons, cisterns, railcars and snow-blowers	18-32	7-10
Locomotives	15-36	12
Regular major inspections of locomotives	7	7
Machine tools, cranes and tractors	15-35	6-13
Transportation equipment	10-15	7-12
Office furniture and equipment	5-15	4-6

Source: Consolidated Financial Statements 2005 by KTZ

6) Residual Value

The residual value in the last year of the project will be counted as the negative investment cost. The residual value will be calculated based on the service lives.

(6) Case of Analysis

In the analysis, the costs and benefits are defined as the difference between those of the “With the project” and the “Without the project” cases. The cases are defined as follows.

1) “With the project” case

If the proposed logistics center is implemented in Aktau and handles cargo.

2) “Without the project” case

If the proposed logistics center is not implemented and cargos are handled without the logistics center. Alternative logistics facilities are not constructed. In this case, cargos should be dealt with by logistics facilities other than in Aktau.

(7) Investment Costs

1) “With the project” case

The total investment costs for the logistic facilities are summarized in Table 11.8-2 and 11.8-3. The additional investment of the logistic facilities will be considered according to the increase of the freight volume.

2) “Without the project” case

Any alternative terminal facilities are not constructed in the area.

Table 11.8-2 Investment Cost (Economic Price) 1/2

Unit: million KZT

Item	2010		2011		2015		2016		Total		
	F/C	L/C	F/C	L/C	F/C	L/C	F/C	L/C	F/C	L/C	F/C+L/C
Railway Management Area											
Rail track	48.907	23.874	0.000	0.000	0.000	0.000	0.000	0.000	48.907	23.874	72.781
Switch	54.147	15.418	0.000	0.000	0.000	0.000	0.000	0.000	54.147	15.418	69.566
Signal and telecommunication system	26.955	13.158	0.000	0.000	0.000	0.000	0.000	0.000	26.955	13.158	40.113
Building	0.000	86.051	0.000	0.000	0.000	0.000	0.000	0.000	0.000	86.051	86.051
Pavement	0.000	44.211	0.000	0.000	0.000	0.000	0.000	0.000	0.000	44.211	44.211
Utility	0.000	25.263	0.000	0.000	0.000	0.000	0.000	0.000	0.000	25.263	25.263
Fence	0.000	1.930	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.930	1.930
Pedestrian bridge	0.000	10.596	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.596	10.596
Sub Total	130.009	220.501	0.000	0.000	0.000	0.000	0.000	0.000	130.009	220.501	350.510
Container Management Area											
4 Warehouse type A	0.000	303.341	0.000	303.341	0.000	303.341	0.000	303.341	0.000	1,213.362	1,213.362
2 Warehouse type B	0.000	386.133	0.000	386.133	0.000	386.133	0.000	386.133	0.000	1,544.532	1,544.532
1 Warehouse type C	0.000	128.364	0.000	128.364	0.000	0.000	0.000	0.000	0.000	256.728	256.728
Fire station	0.000	0.000	0.000	21.311	0.000	0.000	0.000	0.000	0.000	21.311	21.311
Fuel stand	0.000	0.000	0.000	22.303	0.000	0.000	0.000	0.000	0.000	22.303	22.303
Maintenance shop	0.000	0.000	0.000	69.931	0.000	0.000	0.000	0.000	0.000	69.931	69.931
2 Guard office	0.000	0.000	0.000	8.326	0.000	0.000	0.000	0.000	0.000	8.326	8.326
Pavement	0.000	540.888	0.000	540.888	0.000	180.296	0.000	180.296	0.000	1,442.368	1,442.368
Utility	0.000	0.000	0.000	824.211	0.000	0.000	0.000	0.000	0.000	824.211	824.211
Other area	0.000	0.000	0.000	12.719	0.000	0.000	0.000	0.000	0.000	12.719	12.719
Fence	0.000	0.000	0.000	4.684	0.000	0.000	0.000	0.000	0.000	4.684	4.684
Sub Total	0.000	1,358.726	0.000	2,322.211	0.000	869.770	0.000	869.770	0.000	5,420.476	5,420.476

Table 11.8-3 Investment Cost (Economic Price) 2/2

Unit: million KZT

Item	2010		2011		2015		2016		Total		
	F/C	L/C	F/C	L/C	F/C	L/C	F/C	L/C	F/C	L/C	F/C+L/C
Common Management Area											
Administration office	0.000	85.122	0.000	85.122	0.000	0.000	0.000	0.000	0.000	170.243	170.243
Guest house	0.000	258.355	0.000	258.355	0.000	0.000	0.000	0.000	0.000	516.711	516.711
Pavement	0.000	0.000	0.000	50.658	0.000	0.000	0.000	0.000	0.000	50.658	50.658
Utility	0.000	0.000	0.000	28.947	0.000	0.000	0.000	0.000	0.000	28.947	28.947
Others	0.000	0.000	0.000	15.789	0.000	0.000	0.000	0.000	0.000	15.789	15.789
Fence	0.000	0.000	0.000	1.509	0.000	0.000	0.000	0.000	0.000	1.509	1.509
Sub Total	0.000	343.477	0.000	440.380	0.000	0.000	0.000	0.000	0.000	783.857	783.857
Transport Equipment											
RTG	0.000	0.000	431.280	0.000	0.000	0.000	0.000	0.000	431.280	0.000	431.280
Reach stacker	0.000	0.000	92.417	0.000	0.000	0.000	0.000	0.000	92.417	0.000	92.417
Side loader for empty	0.000	0.000	19.254	0.000	0.000	0.000	0.000	0.000	19.254	0.000	19.254
Fork lift (electric)	0.000	0.000	21.564	0.000	0.000	0.000	0.000	0.000	21.564	0.000	21.564
Fork lift (electric)	0.000	0.000	12.322	0.000	0.000	0.000	0.000	0.000	12.322	0.000	12.322
Fork lift (diesel)	0.000	0.000	12.322	0.000	0.000	0.000	0.000	0.000	12.322	0.000	12.322
Fork lift (diesel)	0.000	0.000	23.104	0.000	0.000	0.000	0.000	0.000	23.104	0.000	23.104
Mobile crane	0.000	0.000	115.521	0.000	0.000	0.000	0.000	0.000	115.521	0.000	115.521
Yard tractor	0.000	0.000	61.611	0.000	0.000	0.000	0.000	0.000	61.611	0.000	61.611
Yard chassis	0.000	0.000	27.725	0.000	0.000	0.000	0.000	0.000	27.725	0.000	27.725
Lowbed trailer	0.000	0.000	3.851	0.000	0.000	0.000	0.000	0.000	3.851	0.000	3.851
Sub Total	0.000	0.000	820.973	0.000	0.000	0.000	0.000	0.000	820.973	0.000	820.973
Information and Communication System											
Information and communication system	0.000	0.000	39.092	0.000	0.000	0.000	0.000	0.000	39.092	0.000	39.092
Total	130.009	1,922.704	860.065	2,762.592	0.000	869.770	0.000	869.770	990.074	6,424.834	7,414.909

Note: The Access road, Flyover bridge, Exchange of soil and Land acquisition in the SEZ are considered to be provided by the government.

Source: JICA Study Team

(8) Operation Costs

1) “With the project” case

The operation costs of the logistics center are estimated based on the average monthly salary and other expenses in the staffing plan described in Chapter 11.6. According to national company KTZ JSC’s “Consolidated Financial Statements” that includes financial results for all KTZ’s subsidiaries, the ratio of personnel costs to the other expenses was found to be 25 to 75 in 2005. As for average monthly salaries after deducting personal income tax, KZT 72,000 and 144,000 per month are applied for workers and managers, respectively.

The annual operation costs including maintenance cost of cargo handling equipment are summarized in Table 11.8-4.

Table 11.8-4 Annual Operation Costs (“With the project” case)
(Unit: million KZT)

Year	Annual Operation Costs
2012	1,094
2017 and after	1,094

Source: JICA Study Team

2) “Without the project” case

In this case, additional operation and maintenance costs are not required.

(9) Economic Benefits

The economic benefits of this project are considered as follows.

- 1) The benefit of Transport/Transaction Time Saving (TTS) for freight transport
- 2) The benefit of Vehicle Operating Cost (VOC) saving for freight transport
- 3) Investment and maintenance cost saving
- 4) Other indirect benefits

As it is difficult to quantify the transport/transaction time saving (TTS), the benefits should not be counted in the analysis. Similarly, other indirect benefits cannot be quantified, but they are useful for deciding the implementation of the project.

(10) Vehicle Operating Cost Saving

If the project is not implemented, the freight at the logistics center in Aktau has to be transported by truck instead of railway. This is the benefit of vehicle operating cost saving as the effect of either a decrease or increase in the same transportation service cost through this project compared to the case without the project.

Measurement method

$$C^0 - C^1$$

C^0 : Total transport cost in case this project is not executed

C^1 : Total transport cost after this project is executed

1) VOC of “With the project” case

In case of “With the project” case, the vehicle operating cost (VOC) of trucks will not be required by converting to rail.

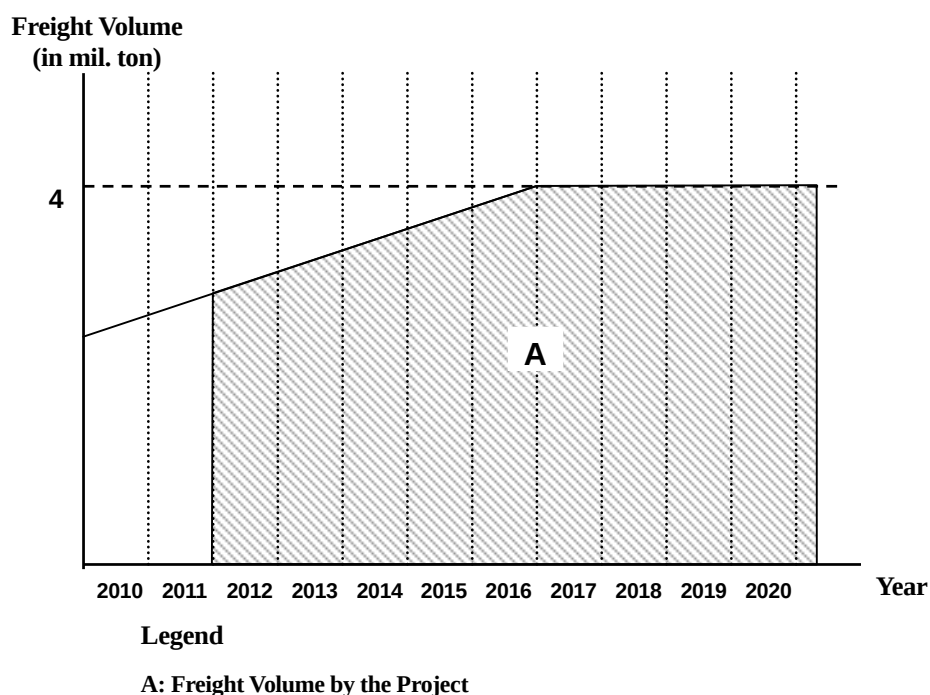
2) VOC of “Without the project” case

In the “Without the project” case, the VOC of trucks is still required. Though data on VOC of trucks have not been available, VOC by truck would cost about 2.5 times as much as transport cost by rail according to a previous study (“Transport and Trade Facilitation Issues in the CIS7, Kazakhstan and Turkmenistan” by the World Bank in 2003). Consequently, the unit transport cost by rail and the VOC are assumed to be KZT1.25/ton-km and KZT3.12/ton-km, respectively, referring to the consolidated financial statements of KTZ. The average transport distance of the rail freight was 748.3 km based on results between 2001 and 2005 according to the Statistical Yearbook of Kazakhstan 2006. 50% of VOC saving benefits are counted in the analysis. The annual VOC saving benefits are summarized in Table 11.8-5 and the freight volume in the project is illustrated in Figure 11.8-1.

Table 11.8-5 Annual VOC Saving Benefit

Item	2012	2017 and after
Freight Volume by the Project (million ton)	2.857	4.240
Ton-Kilometrage Converting to Rail (million ton-km)	2,138	3,173
VOC Saving Benefit (million KZT)	2,003	2,972

Source: JICA Study Team

**Figure 11.8-1 Freight Volume by the Project**

(11) Maintenance Costs Saving

If the project is not implemented, maintenance costs for existing highways would be required to deal with the non-converted freight traffic by truck. Reduction of these maintenance costs will become an economic benefit. According to data from the MTC, annual maintenance cost for republican highways has been estimated at KZT22.1 billion in the year 2007. On the other hand, total road transport volume was 47.1 billion ton-kilometers, according to Statistical Yearbook 2006. Comparing the total road transportation and the transportation converted to railway, a maintenance cost saving can be obtained. The effective ratio of maintenance costs by road transport is assumed to be 50% of the total costs. The results are shown in Table 11.8-6.

Table 11.8-6 Investment and Maintenance Cost Saving

Item	2012	2017 and after
Transport Volume Converted to Rail (million ton-km)	2,138	3,173
Maintenance Cost Saving (million KZT)	502	746

(12) Indirect Benefit

In this analysis, in addition to the benefits mentioned above, other indirect benefits are found. As it is difficult to evaluate these benefits quantitatively, the value is not shown in the figure. However, it is considered an important factor in the decision to adopt this project.

The outline of these benefits is as follows.

1) Improvement of natural and social environment

By the execution of this project, some freight traffic volume converting from railway to trucks can be avoided. The non-converted freight traffic means a reduction of exhaust from trucks in addition to reduction of traffic congestion and traffic accidents.

The reduction of exhaust from trucks will contribute to the improvement of the global environment in reducing greenhouse gas emissions in addition to improvement of the living environment in Kazakhstan. In this study, no calculation of reduction of volume of CO₂ has been carried out.

2) Improvement of regional freight transport

The development of the freight market in Kazakhstan is rapidly progressing in conjunction with the nation's economic growth. Insufficient freight transaction facilities in the area cause a lot of problems for the freight industry. The introduction of the logistic center will be one of the solutions to the freight problems in Kazakhstan.

3) Rationalization of cargo handling

The construction of the logistics center will promote containerization of freight and contribute to rationalization of the cargo handling (transshipment, reduction of transaction time, etc.) and the development of logistics in the region.

4) Promotion of related industries

Because of the production and sale of materials and equipment ordered in relation to the implementation of the project, development of related industries and more employment opportunities can be expected. The freight industry will be also promoted by the improvement of freight facilities.

5) Effect of technology transfer

Through this project, the newest freight handling technologies will be introduced. The transfer of technologies for the freight industry in Kazakhstan is expected.

(13) Result of Analysis

The results of the analysis based on the above conditions are summarized in Table 11.8-7 and Table A11.8-1 of the Appendix 11-2.

As all the evaluation values are found excellent, this project is considered economically viable.

Table 11.8-7 Results of Economic Analysis

Discount rate = 12%

B/C ratio	Net Present Value (million KZT)	Economic Internal Rate of Return (EIRR)
1.70	7,055	29.01 %

(14) Sensitivity Analysis

Some factors, such as investment cost, operation and maintenance cost and benefits applied to this analysis include certain variation. Some margins are assumed for such variable factors and by finding the variation of the result due to the margin, the stability of the project feasibility can be secured.

As shown in Table 11.8-8, even in cases of +10% investment and O&M costs increase and -10% decrease of the economic benefits, the EIRR exceeds 12%, which is the criterion for evaluation of an investment opportunity and cost considered by various international organizations. It is, therefore, confirmed that this project is extremely sound from the standpoint of the national economy.

Table 11.8-8 Result of Sensitivity Study of Economic Analysis

Investment cost and O&M cost Benefit	-10%	-5%	0%	+5%	+10%
+10%	37.35%	34.98%	32.82%	30.83%	29.01%
+5%	35.31%	33.02%	30.93%	29.01%	27.24%
0%	33.24%	31.03%	29.01%	27.16%	25.45%
-5%	31.14%	29.01%	27.06%	25.28%	23.64%
-10%	29.01%	26.96%	25.09%	23.38%	21.80%

11.8.2 Financial Analysis

(1) Objective of Analysis

The objective of the financial analysis is to evaluate to what extent this project has profitability and whether sound operation under various financing plans is feasible or not.

(2) Methodology of Analysis

As the evaluation indexes of the project, Financial Internal Rate of Return on the Project (Project FIRR), FIRR on the Equity (Equity FIRR) and Financial Net Present Value (FNPV) are calculated to judge viability to carry out a commercial undertaking.

1) Project FIRR

The Project FIRR is the discount rate whereby the total of the investment cost (-), the revenue (+) and the expenditure (-) converted into the net present value become equal and is calculated using the following formula:

$$\sum_{t=0}^n \frac{(B_t - C_t)}{(1 + \text{FIRR})^t} = 0$$

Where:

N : the period for the analysis (first year $t = 0$)

B_t : the revenue of each year

C_t : the investment cost and the expenditure (the maintenance and operation cost) of each year

2) Equity FIRR

The FIRR on the equity is calculated in the same manner as that for project calculation using the cash flow in which the loan income, interest and repayment are included. This shows the anticipated return amount for the investment fund.

3) Financial Net Present Value (FNPV)

The financial net present value is the total of annual net cash flow discounted by the discount rate.

(3) Premises

This analysis is carried out under the following premises.

1) Price

The price for domestic products is the market price including various taxes. That for imported products is the CIF price with customs duties, inland transportation cost and others.

2) Exchange rate

The exchange rates used in the study are assumed to be KZT120.23 to USD1.00 and JPY120.73 to USD1.00 as a mean value in May 2007.

3) Inflation

Since it is difficult to estimate the inflation rate during the whole period of the project, it is not taken into consideration in the analysis. All figures are based on constant prices in the year 2007.

4) Project life for the analysis

The period of the analysis is set for 32 years including the construction period from April 2010 to March 2012 and 30 years operation from April 2012 to March 2042. The construction period of the access road, flyover bridge and soil exchange & improvement from 2008 to the middle of 2010 is not taken into consideration. In the analysis, each project year is considered to begin in April and end the following March.

5) Service lives of the assets

Regarding the life cycle of facilities with proper maintenance, the service lives shown in Table 11.8-1 of 11.8.1 Economic Analysis are presumed. All facilities invested in the project will be considered new assets.

6) Depreciation and residual value

The depreciation is calculated on a straight-line basis over the estimated service lives of the assets. The residual value in the last year of the project is counted as negative investment cost.

7) Interest during construction

The interest during the construction is not considered.

8) Taxation system

Tax legislation of the Republic of Kazakhstan consists of the Tax Code and Normative Legal Acts. The Tax Code establishes the Kazakhstan taxes, levies and general tax principles. The main taxes are shown in Table 11.8-9.

Table 11.8-9 Summary of Tax Rates

Tax	Tax Rate in 2004
Corporate Income Tax (CIT)	30%
Value Added Tax (VAT)	14%
Personal Income Tax (PIT)	5-20%
Social Tax	20-7%
Pension Fund Contribution	10%
Import Duty	0-30% (weighted average rate = 13.9%*)

Note: * is based on the material from the Central Asia Regional Economic Cooperation (CAREC) meeting in 2006

Source: Kazakhstan. A business and investment guide, 2006

In this analysis, the tax rate of CIT is considered 0% because SEZ gives tax preferences on three types, i.e., corporate income tax, land tax and property tax. The personal income tax, fixed asset tax and payroll tax are considered to be included in the O&M costs. For import duty, the tariff rate on imported goods for the project is considered a weighted average rate of 13.9%.

(4) Financing Plan

1) Financing sources

As for the financing sources, the use of international loans, Government funds/Equity, or loans from commercial banks are considered for the project. The conditions of each financing source are summarized in Table 11.8-10.

Table 11.8-10 Financing Sources

No.	Source	Terms of Financing	
1	Government Funds/Equity	Source:	Government fund or Investor
		Ratio of fund-raising:	25% of the project cost based on previous projects
		Dividend:	10% from the 6th year after the inauguration ^{*1}
2	Domestic Loans (in KZT)	Source:	Commercial banks in Kazakhstan
		Ratio of fund-raising:	Up to 75% of the project cost ^{*1}
		Interest rate:	18.2% ^{*2}
		Repayment terms:	Equal payment of principle ^{*1} 10 years
3	Foreign Loans (in USD)	Source:	Foreign export credit agencies
		Ratio of fund-raising:	Up to 75% of the project cost ^{*1}
		Interest rate:	5.51% ^{*2}
		Repayment terms:	Equal payment of principle ^{*1} 10 years
4	ODA Loan (in JPY)	Source:	Japan Bank for International Cooperation (JBIC)
		Ratio of fund-raising:	Up to 85% of the project cost (75% for previous projects)
		Interest rate:	3.00% ^{*2}
		Repayment terms:	Equal payment of principle 25 years with a grace period of 7 years

Note: *1 is an assumption for the analysis.

*2 is based on the weighted average effective interest rate by KTZ Consolidated Financial Statements on December 2005.

2) Proposed Financing Plan and WACC

The financing plan for each case is proposed as shown in Tables 11.8-11 to 11.8-13. The weighted average cost of capital (WACC) has been calculated in real terms for each financial component. The WACC serves as a proxy to assess the financial viability of the project.

Table 11.8-11 Proposed Financing Plan 1

	Financing Component		
	Domestic Loans	Government Funds/Equity	Total
A Weighting of financing component	75.00%	25.00%	100.00%
B Nominal cost	18.20%	10.00%	
C Tax rate	0.00%	0.00%	
D Tax-adjusted nominal cost [B x (1 - C)]	18.20%	10.00%	
E Inflation rate*	7.60%	7.60%	
F Real cost [(1 + D) / (1 + E) - 1]	9.85%	2.23%	
G Weighted component of WACC	7.39%	0.56%	7.95%
WACC (in real terms)	7.95%		

Note: * shows the CPI in December 2005 by the National Bank of Kazakhstan.

Table 11.8-12 Proposed Financing Plan 2

	Financing Component		
	Foreign Loan	Government Funds/Equity	Total
A Weighting of financing component	75.00%	25.00%	100.00%
B Nominal cost	5.51%	10.00%	
C Tax rate	0.00%	0.00%	
D Tax-adjusted nominal cost [B x (1 - C)]	5.51%	10.00%	
E Inflation rate*		7.60%	
F Real cost [(1 + D) / (1 + E) - 1]	5.51%	2.23%	
G Weighted component of WACC	4.13%	0.56%	4.69%
WACC (in real terms)	4.69%		

Note: * shows the CPI in December 2005 by the National Bank of Kazakhstan.

Table 11.8-13 Proposed Financing Plan 3

	Financing Component		
	ODA Loan	Government Funds/Equity	Total
A Weighting of financing component	75.00%	25.00%	100.00%
B Nominal cost	3.00%	10.00%	
C Tax rate	0.00%	0.00%	
D Tax-adjusted nominal cost [B x (1 - C)]	3.00%	10.00%	
E Inflation rate*		7.60%	
F Real cost [(1 + D) / (1 + E) - 1]	3.00%	2.23%	
G Weighted component of WACC	2.25%	0.56%	2.81%
WACC (in real terms)	2.81%		

Note: * shows the CPI in December 2005 by the National Bank of Kazakhstan.

(5) Investment Cost

The initial investment costs are summarized in Table 11.8-14 and 11.8-15.

Table 11.8-14 Investment Cost (Market Price) 1/2

Unit: million KZT

Item	2010		2011		2015		2016		Total		
	F/C	L/C	F/C	L/C	F/C	L/C	F/C	L/C	F/C	L/C	F/C+L/C
Railway Management Area											
Rail track	63.504	27.216	0.000	0.000	0.000	0.000	0.000	0.000	63.504	27.216	90.720
Switch	70.308	17.577	0.000	0.000	0.000	0.000	0.000	0.000	70.308	17.577	87.885
Signal and telecommunication system	35.000	15.000	0.000	0.000	0.000	0.000	0.000	0.000	35.000	15.000	50.000
Building	0.000	98.098	0.000	0.000	0.000	0.000	0.000	0.000	0.000	98.098	98.098
Pavement	0.000	50.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000	50.400	50.400
Utility	0.000	28.800	0.000	0.000	0.000	0.000	0.000	0.000	0.000	28.800	28.800
Fence	0.000	2.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.200	2.200
Pedestrian bridge	0.000	12.080	0.000	0.000	0.000	0.000	0.000	0.000	0.000	12.080	12.080
Sub Total	168.812	251.371	0.000	0.000	0.000	0.000	0.000	0.000	168.812	251.371	420.183
Container Management Area											
4 Warehouse type A	0.000	345.808	0.000	345.808	0.000	345.808	0.000	345.808	0.000	1,383.233	1,383.233
2 Warehouse type B	0.000	440.192	0.000	440.192	0.000	440.192	0.000	440.192	0.000	1,760.766	1,760.766
1 Warehouse type C	0.000	146.335	0.000	146.335	0.000	0.000	0.000	0.000	0.000	292.670	292.670
Fire station	0.000	0.000	0.000	24.295	0.000	0.000	0.000	0.000	0.000	24.295	24.295
Fuel stand	0.000	0.000	0.000	25.425	0.000	0.000	0.000	0.000	0.000	25.425	25.425
Maintenance shop	0.000	0.000	0.000	79.722	0.000	0.000	0.000	0.000	0.000	79.722	79.722
2 Guard office	0.000	0.000	0.000	9.492	0.000	0.000	0.000	0.000	0.000	9.492	9.492
Pavement	0.000	616.613	0.000	616.613	0.000	205.538	0.000	205.538	0.000	1,644.300	1,644.300
Utility	0.000	0.000	0.000	939.600	0.000	0.000	0.000	0.000	0.000	939.600	939.600
Other area	0.000	0.000	0.000	14.500	0.000	0.000	0.000	0.000	0.000	14.500	14.500
Fence	0.000	0.000	0.000	5.340	0.000	0.000	0.000	0.000	0.000	5.340	5.340
Sub Total	0.000	1,548.947	0.000	2,647.321	0.000	991.537	0.000	991.537	0.000	6,179.343	6,179.343

Table 11.8-15 Investment Cost of (Market Price) 2/2

Unit: million KZT

Item	2010		2011		2015		2016		Total		
	F/C	L/C	F/C	L/C	F/C	L/C	F/C	L/C	F/C	L/C	F/C+L/C
Common Management Area											
Administration office	0.000	97.039	0.000	97.039	0.000	0.000	0.000	0.000	0.000	194.078	194.078
Guest house	0.000	294.525	0.000	294.525	0.000	0.000	0.000	0.000	0.000	589.050	589.050
Pavement	0.000	0.000	0.000	57.750	0.000	0.000	0.000	0.000	0.000	57.750	57.750
Utility	0.000	0.000	0.000	33.000	0.000	0.000	0.000	0.000	0.000	33.000	33.000
Others	0.000	0.000	0.000	18.000	0.000	0.000	0.000	0.000	0.000	18.000	18.000
Fence	0.000	0.000	0.000	1.720	0.000	0.000	0.000	0.000	0.000	1.720	1.720
Sub Total	0.000	391.564	0.000	502.034	0.000	0.000	0.000	0.000	0.000	893.598	893.598
Transport Equipment											
RTG	0.000	0.000	560.000	0.000	0.000	0.000	0.000	0.000	560.000	0.000	560.000
Reach stacker	0.000	0.000	120.000	0.000	0.000	0.000	0.000	0.000	120.000	0.000	120.000
Side loader for empty	0.000	0.000	25.000	0.000	0.000	0.000	0.000	0.000	25.000	0.000	25.000
Fork lift (electric)	0.000	0.000	28.000	0.000	0.000	0.000	0.000	0.000	28.000	0.000	28.000
Fork lift (electric)	0.000	0.000	16.000	0.000	0.000	0.000	0.000	0.000	16.000	0.000	16.000
Fork lift (diesel)	0.000	0.000	16.000	0.000	0.000	0.000	0.000	0.000	16.000	0.000	16.000
Fork lift (diesel)	0.000	0.000	30.000	0.000	0.000	0.000	0.000	0.000	30.000	0.000	30.000
Mobile crane	0.000	0.000	150.000	0.000	0.000	0.000	0.000	0.000	150.000	0.000	150.000
Yard tractor	0.000	0.000	80.000	0.000	0.000	0.000	0.000	0.000	80.000	0.000	80.000
Yard chassis	0.000	0.000	36.000	0.000	0.000	0.000	0.000	0.000	36.000	0.000	36.000
Lowbed trailer	0.000	0.000	5.000	0.000	0.000	0.000	0.000	0.000	5.000	0.000	5.000
Sub Total	0.000	0.000	1,066.000	0.000	0.000	0.000	0.000	0.000	1,066.000	0.000	1,066.000
Information and Communication System											
Information and communication system	0.000	0.000	50.760	0.000	0.000	0.000	0.000	0.000	50.760	0.000	50.760
Total	168.812	2,191.882	1,116.760	3,149.355	0.000	991.537	0.000	991.537	1,285.572	7,324.311	8,609.883

Note: The access road, flyover bridge, exchange of soil and land acquisition in the SEZ are considered to be provided by the Government.

Source: JICA Study Team

(6) Revenue

The revenues consist of cargo handling charges (transshipment between modes, distribution and storage and warehousing, cargo loading and unloading, customs clearance, etc.). The revenues from the transshipment, loading and unloading are calculated based on each freight volume and charge. The other handling charges are considered to be 5% of the above.

1) Freight volume

According to "Future Freight Traffic Demand" in Chapter 11.3.3 and "Preliminary Design of Each Facility" in Chapter 11.5.2, freight volumes are summarized in Table 11.8-16. To calculate revenues, they are classified as filled container, empty container and non-containerized cargos. For non-containerized cargos, the freight volumes handled from 2017 are considered to increase up to the maximum handling capacity.

Table 11.8-16 Summary of Annual Freight Volume for Revenue Calculation

Year	Filled Containers (TEU)	Empty Containers (TEU)	Non-containerized Cargo (million ton)
2012	35,901	21,540	1.285
2017 and after	81,210	48,726	2.190

Source: JICA Study Team

2) Tariff revenue

a) Cargo Handling Charges

Referring to Kazakhstan tariff policy for 2007 freight year, cargo handling charges to transship, load and unload filled and empty containers are estimated at KZT6,800 and 3,400 per TEU, respectively. Similarly, charges for non-containerized cargo are considered to be KZT1,200 per ton.

b) Total Revenues

Total revenues calculated based on the above conditions are summarized in Table 11.8-17

Table 11.8-17 Revenues

(Unit: million KZT)

Year	Filled Containers	Empty Containers	Non-containerized Cargo	Other Handling Charges	Total
2012	244	73	1,541	94	1,952
2017 and after	552	166	2,628	167	3,513

Source: JICA Study Team

(7) Expenditure

1) Operation Costs

The operation costs of the logistic center are estimated based on the average monthly salary and other expenses in the staffing plan, in Chapter 11.6. According to the “Consolidated Financial Statements” of the national company, KTZ JSC, that includes financial results of all KTZ’s subsidiaries, the ratio of personnel costs to other expenses was found to be 25 to 75 in 2005. As to the average monthly salaries, KZT80,000 and 160,000 per month are applied to workers and managers, respectively.

Annual operation costs in specific years are summarized in Table 11.8-18.

Table 11.8-18 Annual Operation Costs

(Unit: million KZT)

Year	Annual Operation Costs
2012	1,192
2017	1,192

Source: JICA Study Team

(8) Result of Analysis

1) FIRR

As the result of the calculation in each plan, the indexes of financial evaluation (FNPV, project FIRR, equity FIRR) and cash flows are summarized shown in Tables 11.8-19 and Appendix11-3, respectively. Detailed financial statements are presented in Appendix11-4.

Table 11.8-19 Index of Financial Analysis

Financing Plan	FNPV (million KZT)	Project FIRR (%)	Equity FIRR (%)	WACC (%)
1	10,530	21.21	24.83	7.95
2			36.95	4.69
3			55.20	2.81

Source: JICA Study Team

As the result of the analysis based on the above conditions, the Project FIRRs in Financing Plans 1 to 3 are 21.21%. Under the assumption applied, the projects in all financing plans are considered financially viable, because the Project FIRR is higher than each WACC. As to the Equity FIRRs, they are also found financially sound. There are no significant differences among the financing plans. If the project can be financed by Financing Plan 3 which offers terms of low interest and a long maturity period, that will be more favorable to investors.

(9) Sensitivity Analysis

In the above analysis, uncertainty factors still remain in the adopted elements (investment cost, revenues and expenditures). In order to identify the financial stability of the project, sensitivity analyses were conducted on Financing Plans 1 to 3, which were found financially viable, to observe the variation of the result by assuming fluctuations of each value in accordance with each unreliability.

The result of all sensitivity analyses shown in Table 11.8-20 means that the Project FIRR in the case of the investment cost and expenditure up by 10% and revenue down by 10% can satisfy the WACC. This project will be very stable to fluctuation of investment cost and revenue under each financing plan.

Table 11.8-20 Result of Sensitivity Analysis on Financing Plans 1 to 3

Investment cost & Expenditure	-10%	-5%	0%	+5%	+10%
Revenue					
+10%	22.97%	22.97%	22.97%	22.97%	22.97%
+5%	22.10%	22.10%	22.10%	22.10%	22.10%
0%	21.21%	21.21%	21.21%	21.21%	21.21%
-5%	20.30%	20.30%	20.30%	20.30%	20.30%
-10%	19.37%	19.37%	19.37%	19.37%	19.37%

11.9 Conclusion

On the assumption that the public organizations will bear the cost of land acquisition, soil improvement, access road, railway extension, etc., the projects are considered economically and financially viable.

As to the social and environmental effects of the project, taking into consideration the characteristics of the planned facilities, no element exerting a serious, negative influence on the natural and social environment is found.

Some influences generated with construction are temporary and negligible.

However, sufficient concern for the environment is necessary for the operation vehicle routes.

To make the project viable, the following are proposed.

- In case of implementation, integration is necessary between the project and the regional development plan in Mangystau Oblast.
- To realize this project, cooperation with financial institutions is indispensable regarding the funds for the project.
- Close contact and consultation among the concerned organizations, especially the local government, KTZ, AKTAU INTERNATIONAL SEA COMMERCIAL PORT and SEZ, are essential for the arrangement of infrastructure, burden of the cost, etc.
- To make the project viable, it is important to carry out a strategy to create freight demand.

Appendix 3.1-1 Arrival import freight by commodity type and stations in 2006

Unit: thousand tons

Arrival Station	1.Oilseeds	2.CO2carbons	3.Chemical material	4.Chemical soda	5.Coal	6.Fertilizers	7.Chlorine ore	8.Non-ferrous metal	9.Steelage of non-ferrous metal	10.Iron ore	11.Cement	12.Ferrous metal	All Cargo
Бий-Курган	0	0	4	0	0	1	0	0	0	0	0	0	5
Өзкент	0	0	1	0	0	0	0	0	0	0	0	0	1
Бий	0	9	0	2	0	0	0	0	0	0	0	0	11
Ош	10	1	1	4	0	1	0	0	0	0	0	15	32
Өзкентуу С.	2	0	1	1	0	0	0	0	0	0	0	3	7
Өзкентуу 3.	4	1	0	0	0	18	0	0	0	0	0	1	24
Өзкентуу 2.	12	0	1	0	0	0	0	0	0	0	0	17	36
Өзкентуу 1.	13	1	2	0	0	0	0	0	0	0	0	5	21
Шербет	3	0	0	0	0	0	0	0	0	0	0	0	3
Шубар-Курган	0	0	0	0	0	0	0	0	0	0	0	1	1
Шоролон	1	0	1	0	0	0	0	0	0	0	0	0	2
Шошан	0	0	1	0	0	0	0	0	0	0	0	0	1
Шерне	3	1	1	0	0	0	0	0	0	0	0	0	5
Шоролон	1	2	0	0	0	0	0	0	0	0	0	0	3
Шинг	1	0	0	0	0	0	0	0	0	0	0	0	1
Чу	14	2	1	0	0	2	0	0	0	0	0	0	19
Чокто	0	1	0	0	0	0	0	0	0	0	0	0	1
Чыгыш	8	0	0	0	0	0	0	0	0	0	0	1	9
Чыгыш	218	13	78	32	0	3	0	1	0	0	0	16	359
Чыгыш	0	2	0	0	0	0	0	0	0	0	0	0	2
Чыгыш	1	2	5	4	0	9	0	0	0	0	0	0	21
Чыгыш	0	0	0	0	0	0	0	0	0	0	0	1	1
Чыгыш	81	13	7	2	0	7	0	0	0	0	0	0	110
Чыгыш	4	0	2	0	0	0	0	0	0	0	0	5	11
Чыгыш	1	0	0	0	0	0	0	0	0	0	0	0	1
Чыгыш	4	0	12	0	0	1	0	0	0	0	0	9	28
Чыгыш	3	1	2	16	0	1	0	0	0	0	0	8	31
Чыгыш	5	18	0	1	0	1	0	0	0	0	0	0	25
Чыгыш	0	0	0	2	0	0	0	0	0	0	0	2	4
Чы-Тобе	4	9	1	1	0	0	0	0	0	0	0	0	15
Чыгыш	1	0	0	0	0	1	0	0	0	0	0	0	2
Чы-Булган	0	1	0	0	0	0	0	0	0	0	0	0	1
Чы-Ташкент	5	0	0	2	3	0	0	0	0	0	0	0	10
Чы-Кашкент	37	0	3	3	1	0	0	0	0	0	0	0	44
Чыгыш Ташкент	157	89	16	4	0	0	0	0	0	0	1	18	265
Чыгыш	1	8	1	0	0	0	0	0	0	0	0	14	22
Чы-Алаш	1	0	0	0	0	0	0	0	0	0	0	0	1
Чы	44	3	10	9	0	0	0	0	0	0	0	31	97
Чыгыш	12	99	3	5	0	0	0	0	0	0	0	2	121
Чыгыш	3	0	0	0	0	0	0	0	0	0	0	0	3
Чыгыш	27	4	17	4	0	1	0	0	0	0	0	2	55
Чыгыш	0	0	0	0	0	0	0	0	0	0	2	0	2
Чы	1	0	0	0	0	0	0	0	0	0	0	1	2
Чы	4	11	0	0	0	0	0	0	0	0	0	1	16
Чы	1	0	0	0	0	0	0	0	0	0	0	0	1
Чы-Ушкент	0	0	0	0	0	1	0	0	0	0	0	0	1
Чы	3	0	0	0	0	2	0	0	0	0	0	0	5
Чы	25	8	2	1	0	0	0	0	0	0	0	2	38
Чы-Ташкент	23	2	1	1	10	0	0	0	0	0	0	0	37
Чы	0	1	1	0	0	0	0	0	0	0	0	0	2
Чы	0	198	0	2	0	0	0	0	0	0	0	0	200
Чы	0	0	0	0	0	0	0	0	0	0	48	0	48
Чы-Жан	7	4	0	0	0	1	0	0	0	0	0	0	12
Чы	0	0	3	0	0	0	0	0	0	0	0	0	3
Чы-Курган	37	14	3	8	0	0	0	4	0	0	0	9	75
Чы	180	0	0	0	0	0	0	0	0	0	0	0	180
Чы	4	2	3	2	0	0	0	0	1	0	0	0	12
Чы	0	5	2	0	0	0	0	0	0	0	0	0	7
Чы	313	91	279	9	0	0	0	0	0	0	1	280	973
Чы-Ташкент	0	0	2	0	0	0	0	0	0	0	0	0	2
Чы	0	1	0	0	0	0	0	0	0	0	0	0	1

Appendix 3.1-1 Arrival import freight by commodity type and stations in 2006 (cont'd)

Arrival Station	1.Oilbarrels	2.Oil cargoes	3.Stationary material	4.Chemical soda	5.Coal	6.Fertilizers	7.Color ore	8.Non fer-metal	9.Waste of fer-metal	10.Iron ore	11.Grain	12.Petroleum metal	All Cargo
Семипалатинск	4	0	0	2	0	0	0	0	0	0	0	0	6
Семипалатинск	52	27	2	9	0	0	0	1	0	0	0	4	95
Саян	0	0	0	0	0	1	0	0	0	0	0	0	1
Саян-Тобе	1	0	0	0	0	0	0	0	0	0	0	0	1
Саян-Шаран	1	0	0	0	0	0	0	0	0	0	0	0	1
Саян-Орск	0	2	0	0	0	0	0	0	0	0	0	0	2
Саян-Алаш	31	2	15	0	1	4	0	0	0	0	0	0	53
Саян-Астана	0	1	0	0	0	0	0	0	0	0	0	0	1
Сайт-Уте	5	0	0	0	0	0	0	0	0	0	0	12	17
Ресурсный	100	0	0	0	0	0	0	0	0	0	0	0	100
Тайын	3	0	1	0	0	0	0	0	0	0	4	0	8
Паровозная	0	1	0	0	0	0	0	0	0	0	0	0	1
Паровозная	1	0	0	0	0	0	0	0	0	0	0	0	1
Павлодар	1	0	0	0	0	4	0	0	0	0	0	0	5
Павлодар Юж.	170	19	7	171	62	1	0	2	0	0	0	20	452
Павлодар Сев	10	3	2	7	0	0	0	3	0	0	0	3	28
Павлодар	56	7	11	7	11	0	0	0	13	0	4	56	165
Павлодар Порт	26	4	0	7	0	0	0	0	0	0	0	0	37
Отар	0	7	2	0	0	0	0	0	0	0	0	0	9
Октябрьск	0	12	0	0	0	0	0	0	0	0	0	0	12
Октябрь	9	2	1	2	0	0	0	0	0	0	0	16	30
Нурлы	3	2	0	0	0	4	0	0	0	0	0	0	9
Ново-Уральск	0	2	0	0	0	0	0	0	0	0	0	0	2
Новоуралинская	1	1	0	0	0	1	0	0	0	0	0	0	3
Новоуральск	2	0	0	6	0	0	0	0	3	0	0	3	14
Нов. У. Канев.	24	1	14	0	0	0	0	0	0	0	0	13	52
Ново-Уте	0	0	1	0	0	0	0	0	0	0	0	0	1
Новоселов	154	0	0	0	9	0	0	0	0	0	0	1	164
Муром	7	1	0	1	0	5	0	0	0	0	0	0	14
Мугаузерская	1	0	0	0	0	1	0	0	0	0	0	0	2
Мостай-Таш	0	0	1	0	0	0	0	0	0	0	0	0	1
Медве	134	29	4	8	0	1	0	0	0	0	0	6	182
Масанбет	22	32	39	18	0	0	0	0	0	0	0	1	112
Мартин	4	6	4	3	0	0	0	0	0	0	0	0	17
Монгол	60	2	0	0	0	1	0	0	0	0	0	0	63
Монтышев	87	28	9	12	0	1	0	0	0	0	0	40	177
Монгол	3	5	0	0	0	0	0	0	0	0	0	2	10
Монгол	8	5	0	0	0	0	0	0	0	0	0	73	84
Мойман	2	8	1	0	0	0	0	0	0	0	0	0	11
Мойман	9	0	0	1	0	0	0	0	0	0	1	0	11
Мой-Курум	72	32	13	6	0	1	0	0	1	0	4	10	139
Луганск	6	7	4	0	0	0	0	0	0	0	0	41	58
Ливонь	37	0	2	0	0	0	0	0	0	0	0	0	39
Ливоньгорск	84	4	1	5	0	3	8	2	0	0	0	10	117
Линтер	0	1	0	0	0	0	0	0	0	0	0	0	1
Кустанай	156	94	20	14	0	0	0	0	0	0	1	7	292
Курорт-Бер.	7	20	4	0	0	0	0	0	0	0	0	51	82
Курман	84	6	23	3	0	1	11	1	0	0	1	11	141
Кулунга	1	1	0	0	0	0	0	0	0	0	0	0	2
Кулашары	49	13	16	11	0	0	1	0	0	0	0	16	106
Коскудук	0	0	0	1	0	4	0	0	0	0	0	0	5
Коргоушан	13	2	19	13	14	25	32	0	0	0	0	12	130
Кочетов	1	0	0	0	0	1	0	0	0	0	0	0	2
Кокшетау 2	1	3	0	0	0	0	0	0	0	0	0	0	4
Кокшетау 1	74	34	14	5	0	2	0	0	0	0	0	0	129
Кокш	0	19	0	0	0	0	0	0	0	0	0	0	19
Кой-Гулар	0	1	0	0	0	0	0	0	0	0	0	0	1
Кызы	0	9	0	0	0	0	0	0	0	0	0	0	9
Кзыл-Сай	23	1	33	1	0	22	0	0	0	0	14	0	94
Кзыл-Орда	55	8	32	4	0	5	0	0	0	0	1	9	114
Кзыл-Джир	3	5	0	0	0	2	0	0	0	0	0	1	11

Appendix 3.1-1 Arrival import freight by commodity type and stations in 2006 (cont'd)

Arrival Station	1, Other s	2, Oil cargoes	3, Mineral g material	4, Chemical soda	5, Coal	6, Fertilizers	7, Color ore	8, Non F-metal	9, Metallage of F-metal	10, Iron ore	11, Grains	12, Precious metal	All Cargo
Egypt	110	5	15	2	0	10	0	0	0	0	0	3	145
Egypte	0	6	0	0	0	0	0	0	0	0	0	0	6
Ecuador Mission	20	2	7	3	0	0	0	0	1	0	0	11	44
Ecuador Aguar	0	1	0	0	0	4	0	0	0	0	0	0	5
Ecuador	0	1	0	0	0	0	0	0	0	0	0	0	1
Ecuador	1	0	0	0	0	0	0	0	0	0	0	0	1
Ecuador 1	1	0	6	0	0	2	0	0	0	0	0	1	10
Ecuador Aguar	1	1	0	0	0	0	0	0	0	0	0	0	2
Ecuador	18	13	12	3	0	1	0	0	0	0	0	29	76
Ecuador	8	2	7	0	0	0	0	0	0	0	0	3	20
Ecuador 1	14	12	3	6	0	1	0	1	0	0	0	3	40
Ecuador	0	0	0	0	0	0	0	0	0	0	1	0	1
Ecuador	3	0	1	1	0	0	0	0	0	0	0	0	5
Ecuador	1	7	0	0	0	0	0	0	0	0	0	0	8
Ecuador	122	6	63	4	0	0	0	0	0	0	0	35	230
Ecuador	3	9	0	0	0	0	0	0	0	0	0	1	13
Ecuador	135	0	0	30	26	0	0	0	0	0	0	1	192
Ecuador 1	3	5	0	1	0	2	0	0	0	0	0	0	11
Ecuador	0	8	0	0	0	1	0	0	0	0	0	0	9
Ecuador	1	5	0	0	0	0	0	0	0	0	0	0	6
Ecuador	0	2	0	0	0	0	0	0	0	0	0	0	2
Ecuador More	1	1	4	0	0	0	0	0	0	0	0	0	6
Ecuador	0	10	0	0	0	0	0	0	0	0	0	0	10
Ecuador 2	1,069	92	118	72	0	1	0	13	0	0	7	275	1,647
Ecuador 1	866	221	95	136	0	2	0	3	0	0	3	281	1,607
Ecuador	10	0	0	0	0	3	0	0	0	0	0	0	13
Ecuador	270	49	31	13	0	2	0	2	0	0	0	20	387
Ecuador	3	7	0	0	0	0	0	0	0	0	0	4	14
Ecuador 1	165	25	35	10	0	3	0	0	0	0	6	52	296
Ecuador	13	3	0	38	0	0	0	0	0	0	0	53	107
Ecuador	453	89	167	52	0	0	0	2	2	0	0	127	892
Ecuador	6	0	0	0	0	0	0	0	0	0	0	0	6
Ecuador	1	1	0	0	0	0	0	0	0	0	0	0	2
Ecuador	0	0	0	0	0	0	0	0	0	0	2	0	2
Ecuador	153	355	18	6	0	0	0	0	0	0	0	31	563
Ecuador	0	7	0	0	2	0	0	0	0	0	0	0	9
Ecuador	1	0	1	0	0	3	0	0	0	0	0	0	5
Ecuador	85	4	3	0	0	0	0	0	0	0	0	19	111
Total	9,237	2,689	1,558	1,125	291	302	122	48	32	184	157	2,222	17,967

Appendix 3.1-1 Arrival import freight by commodity type and stations in 2006 (cont'd)

Arrival Station	1.Other	2.Oil cargoes	3.Human material	4.Chemical soda	5.Coal	6.Fertilizers	7.Colored ore	8.Non ferrous metal	9.Steel age of ferrous metal	10.Iron ore	11.Grain	12.Other metal	All Cargo
Караулашлы	1	0	0	0	0	0	0	0	0	0	0	0	1
Караулаш-Уг	28	15	0	0	0	0	0	0	0	0	0	29	72
Караулаш-II	24	14	1	0	0	0	0	0	0	0	1	19	59
Караулаш-С.	4	5	2	2	0	0	0	0	0	0	0	1	14
Караулаш	151	4	26	11	0	0	0	0	0	0	0	45	237
Караулы	0	0	4	0	0	4	0	0	0	0	0	0	8
Карабасан	91	0	0	0	0	0	0	0	0	0	0	0	91
Карабас	1	1	0	0	0	0	0	0	0	0	0	0	2
Каттабай	31	1	1	0	0	1	0	0	0	0	42	1	77
Кашагыч	7	146	5	0	0	0	0	0	0	0	0	8	168
Кашгар	0	0	0	0	0	1	0	0	0	0	0	0	1
Кайрак	1	3	0	1	0	0	0	0	0	0	0	0	5
Кашакур	11	15	6	1	0	5	0	0	0	0	3	13	54
Кашагыш	9	15	7	12	0	0	0	0	0	0	0	6	49
Кашагыш	7	1	2	0	0	4	0	0	0	0	0	1	15
Кашагыш	1	0	0	0	0	0	0	0	0	0	0	0	1
Кашагыш	14	0	5	1	0	0	0	0	0	0	0	0	20
Кашагыш	9	26	26	0	0	0	0	0	0	0	0	0	61
Кашагыш	2	4	2	3	0	1	0	0	0	0	0	4	16
Кашагыш	161	34	26	35	43	10	70	5	1	0	0	44	429
Кашагыш	2	4	0	0	0	5	0	0	0	0	0	0	11
Кашагыш	0	2	0	0	0	0	0	0	0	0	0	0	2
Кашагыш	29	7	6	5	0	1	0	0	0	0	0	9	57
Кашагыш	26	3	3	1	0	0	0	0	0	0	0	0	33
Кашагыш	4	0	0	0	0	0	0	0	0	0	0	0	4
Кашагыш	2	1	1	1	0	0	0	0	0	0	0	1	6
Кашагыш	843	15	7	1	0	41	0	0	0	0	6	31	744
Кашагыш	21	18	7	11	0	23	0	1	0	0	0	20	101
Кашагыш	2	3	0	0	0	0	0	0	0	0	0	1	6
Кашагыш	1	3	0	0	0	0	0	0	0	0	0	0	4
Кашагыш	2	2	1	6	0	10	0	0	0	0	0	1	24
Кашагыш	28	4	4	1	0	1	0	0	0	0	2	2	42
Кашагыш	160	186	5	28	29	0	0	7	9	182	0	49	855
Кашагыш	1	4	0	0	0	0	0	0	0	0	0	1	6
Кашагыш	2	0	0	0	0	0	0	0	0	0	0	0	2
Кашагыш	1	0	2	0	0	0	0	0	0	0	0	0	3
Кашагыш	1	9	0	0	0	0	0	0	0	0	0	0	10
Кашагыш	2	2	1	0	0	0	0	0	0	0	0	1	6
Кашагыш	442	10	1	34	80	0	0	0	1	2	0	15	585
Кашагыш	0	3	0	0	0	0	0	0	0	0	0	0	3
Кашагыш	1	0	0	0	0	0	0	0	0	0	0	0	1
Кашагыш	2	2	0	0	0	0	0	0	0	0	0	0	4
Кашагыш	0	0	0	0	0	0	0	0	0	0	0	2	2
Кашагыш	21	6	1	1	0	3	0	0	0	0	0	12	44
Кашагыш	0	0	0	0	0	2	0	0	0	0	0	0	2
Кашагыш	0	0	1	0	0	0	0	0	0	0	0	0	1
Кашагыш	4	0	2	0	0	0	0	0	0	0	0	0	6
Кашагыш	10	1	0	0	0	2	0	0	0	0	0	0	13
Кашагыш	578	81	42	123	0	0	0	0	0	0	0	52	876
Кашагыш	0	3	0	0	0	0	0	0	0	0	0	0	3
Кашагыш	19	2	2	1	0	0	0	0	0	0	2	1	27
Кашагыш	0	0	1	0	0	12	0	0	0	0	0	0	13
Кашагыш	43	6	5	33	0	0	0	0	0	0	0	39	126
Кашагыш	0	1	0	0	0	0	0	0	0	0	0	0	1
Кашагыш	0	3	0	0	0	0	0	0	0	0	0	0	3
Кашагыш	1	0	0	0	0	0	0	0	0	0	0	0	1
Кашагыш	4	0	6	0	0	0	0	0	0	0	0	0	10
Кашагыш	1	2	0	0	0	0	0	0	0	0	0	0	3
Кашагыш	20	0	0	0	0	1	0	0	0	0	0	3	24
Кашагыш	70	1	0	0	0	0	0	0	0	0	0	0	71
Кашагыш	70	2	1	2	0	0	0	0	0	0	0	0	75

Appendix 3.1-2 OD Matrix of Railway Export Freight in 2006

Unit: thousand tons

	Алтай-Тогр	Березов-Тогр	Донец-Тогр	Карабалта	Кузнец	Мамонтов-Тогр	Белозерка	Егоров-Тогр	Муром-Тогр	Березов-Тогр	Амурски
Амурск	190	0	0	0	0	0	0	0	357	0	0
Амурск	0	0	23	0	0	0	0	0	0	0	0
Амур-Амур	0	0	67	0	0	0	0	0	0	0	0
Амурск	0	0	0	0	0	0	0	23	0	0	0
Амур	0	0	0	0	0	0	0	0	0	0	286
Амурск	0	0	0	0	0	0	0	0	0	0	14
Березов-Тогр	0	0	52	0	0	0	0	0	0	0	0
Березов	1,653	0	0	0	0	0	0	0	0	0	0
Донец-Тогр	0	0	98	0	0	0	0	0	22	0	0
Донец-Тогр	0	0	0	0	0	0	0	0	0	0	24
Донец-Тогр	833	0	0	0	0	920	0	0	0	0	0
Донец	0	0	146	0	0	0	0	0	0	0	0
Донец-Тогр	0	0	0	0	0	0	0	0	0	0	3
Егоров-Тогр	0	0	448	0	0	0	0	0	0	0	0
Железнодорожный	554	0	406	0	0	0	0	0	0	0	0
Железнодорожный	0	0	0	0	0	0	0	0	0	0	0
Железнодорожный	0	0	59	0	0	0	0	0	0	0	0
Железнодорожный	0	0	4,376	0	0	0	0	165	0	0	0
Железнодорожный	0	0	0	0	0	0	0	36	0	0	0
Железнодорожный	0	0	108	0	0	0	0	0	0	0	0
Железнодорожный	0	0	0	0	0	0	0	0	0	0	0
Железнодорожный	0	0	0	0	0	0	0	0	0	0	0
Железнодорожный	0	0	0	0	0	0	0	0	0	0	38
Железнодорожный	0	20	0	195	0	0	0	111	0	0	0
Железнодорожный	16	0	0	0	0	0	0	0	20	0	0
Железнодорожный	0	0	0	0	0	0	0	0	0	0	20
Железнодорожный	0	0	8	0	0	0	0	0	0	0	0
Железнодорожный	0	0	372	0	0	0	0	0	0	0	0
Железнодорожный	0	0	8	0	0	0	12	0	38	0	0
Железнодорожный	0	0	77	0	0	0	0	0	0	0	0
Железнодорожный	0	0	0	0	13	0	0	73	0	0	0
Железнодорожный	0	0	0	0	0	0	0	11	0	0	0
Железнодорожный	0	0	5	0	0	0	0	133	0	0	0
Железнодорожный	0	0	0	0	0	0	0	0	29	0	33
Железнодорожный	0	0	0	0	0	0	38	0	29	0	0
Железнодорожный	283	0	0	0	0	0	0	0	0	0	8
Железнодорожный	0	0	101	0	0	0	0	613	0	0	0
Железнодорожный	0	0	376	0	0	0	0	0	505	80	0
Железнодорожный	0	0	7	0	0	0	0	0	0	0	0
Железнодорожный	0	0	0	0	28	0	0	0	0	0	125
Железнодорожный	0	0	18	0	0	0	0	0	0	0	0
Железнодорожный	1,548	0	0	0	0	0	0	0	0	0	0
Железнодорожный	0	0	0	0	0	0	0	0	0	0	0
Железнодорожный	0	0	0	0	0	0	0	1,213	0	0	9
Железнодорожный	0	0	0	0	0	0	0	0	0	0	0
Железнодорожный	0	0	1	0	0	0	0	0	0	0	0
Total	5,077	20	6,756	195	41	920	51	2,380	1,000	80	558

Appendix 3.1-2 OD Matrix of Railway Export Freight in 2006 (cont'd)

	Васильев	Дзержинский	Гусь	Ахтаничи	Ахтаничи	Дзержинский	Белая	Ахтаничи	Гусь	Белая	Total
Ахтаничи	166	0	0	368	0	0	249	24	0	441	1,795
Ахтаничи	4	0	0	11	0	0	0	0	0	21	59
Ахтаничи-Ахтаничи	0	0	0	3	0	0	0	0	0	7	77
Ахтаничи	0	0	0	142	0	0	3	0	0	129	297
Ахтаничи	0	24	0	0	0	0	80	142	0	70	602
Ахтаничи	0	0	0	0	16	0	8	0	0	90	128
Васильев	0	0	0	184	0	0	0	0	0	13	249
Васильев	0	0	0	187	0	0	0	0	32	0	1,872
Дзержинский	35	193	0	49	0	0	9	0	0	116	522
Дзержинский	0	0	0	0	0	0	0	47	0	148	219
Дзержинский	0	0	0	0	0	0	0	15	0	0	1,768
Дзержинский	0	0	0	813	0	0	0	0	0	50	1,000
Дзержинский	0	0	0	58	39	0	0	20	0	153	273
Васильев	0	213	0	0	0	0	0	0	0	279	940
Васильев	0	0	0	635	0	232	19	0	0	1,130	2,976
Васильев	0	0	0	62	0	2	0	0	0	0	64
Васильев	0	0	0	113	0	0	0	0	0	42	214
Васильев	0	0	0	10,841	0	0	0	0	0	0	15,382
Васильев	0	0	0	414	0	0	0	0	0	94	548
Васильев	26	0	0	70	0	0	11	0	0	26	241
Васильев	0	0	0	121	0	0	0	0	0	361	482
Васильев	0	0	0	0	0	0	0	50	0	0	50
Васильев	0	0	279	794	0	0	970	0	0	88	2,169
Васильев	0	0	0	71	0	0	144	0	0	328	869
Васильев	0	0	0	24	0	0	0	0	0	103	163
Васильев	0	0	0	0	0	0	0	0	0	0	20
Васильев	0	0	0	23	0	0	0	0	0	0	31
Васильев	99	0	0	59	0	0	906	0	0	197	1,633
Васильев	0	0	0	105	127	0	0	58	0	372	720
Васильев	0	0	0	58	0	0	0	0	0	16	151
Васильев	0	0	0	44	0	0	0	0	0	53	183
Васильев	0	0	0	98	0	0	0	0	0	69	168
Васильев	0	0	0	135	0	0	0	47	0	154	474
Васильев	0	0	0	0	14	0	0	0	0	134	210
Васильев	0	0	0	20	0	0	0	0	0	120	208
Васильев	0	0	0	0	0	0	0	0	0	21	310
Васильев	0	0	0	786	0	0	0	0	0	28	1,528
Васильев	126	0	0	0	0	0	0	151	0	426	1,644
Васильев	0	0	0	0	0	0	0	23	0	0	30
Васильев	0	0	0	128	0	0	50	0	0	120	451
Васильев	0	0	0	0	20	0	0	11	0	15	64
Васильев	0	0	0	0	0	221	0	347	0	78	2,194
Васильев	0	0	0	36	0	0	0	0	0	0	36
Васильев	0	0	556	21,008	0	0	0	0	0	1,079	22,843
Васильев	0	0	0	2,531	0	0	0	0	0	0	3,753
Васильев	13	0	0	13	0	0	0	0	0	81	87
Unknown	0	0	0	43	0	0	0	0	0	15,068	15,112
Total	469	430	835	40,037	216	455	2,448	935	32	21,700	84,816

Appendix 3.1-3 Railway Transit Freight Volumes

Transit Transport Volumes by Departure Country

Unit: 1000 ton

Country in Russian	Country in English	2005	2006
Россия	Russia	3,956.8	4,709.6
Узбекистан	Uzbekistan	1,519.7	1,768.3
Китай	China	749.4	1,146.4
Таджикист	Tajikistan	568.5	462.1
Украина	Ukraine	429.9	393.3
Кыргызста	Kyrgyzstan	333.8	379.8
Бразилия	Brazil	148.4	181.7
Беларусь	Belarus	107.2	218.3
Туркменис	Turkmenistan	114.8	197.4
Польша	Poland	199.5	79.4
Литва	Lithuania	133.5	107.9
Латвия	Latvia	3.0	25.9
Латвия	Latvia	33.8	57.9
Корея	Korea	0.0	87.5
Корея (КН	North Korea	82.7	3.9
США	THE USA	47.5	23.4
Словакия	Slovakia	14.4	54.9
Иран	Iran	30.4	18.9
Финляндия	Finland	25.2	23.2
Германия	Germany	23.2	22.1
Турция	Turkey	23.7	21.6
Монголия	Mongolia	33.8	1.1
Венгрия	Hungary	17.8	16.2
Швеция	Sweden	10.5	16.6
Эстония	Estonia	9.3	16.3
Афганиста	Afghanistan	8.6	16.6
Куба	Cuba	15.1	3.2
Австрия	Austria	7.4	10.0
Азербайдж	Azerbaijan	4.3	13.0
Чехия	Czechia	12.0	3.9
Нидерланд	The Netherlands	3.5	10.5
Румыния	Romania	6.6	7.3
Япония	Japan	7.7	5.2
Чили	Chile	11.4	0.1
Бельгия	Belgium	4.6	6.8
Молдова	Moldova	3.3	5.1
Дания	Denmark	6.4	0.2
Канада	Canada	4.5	2.0
Аргентина	Argentina	1.3	5.1
Великобри	The Great Britain	4.4	1.9
Испания	Spain	2.4	1.3
Норвегия	Norway	2.8	0.4
Египет	Egypt	0.1	3.0
Швейцария	Switzerland	0.9	2.3
Болгария	Bulgaria	2.2	0.4
Прочие стр	The other countries	2.5	0.1
Италия	Italy	1.3	0.8
Объед.Ара	Объед. Arab	0.0	2.1
Израиль	Israel	1.0	0.8
Малайзия	Malaysia	0.8	0.7
Сальвадор	El Salvador	0.0	1.5
Тайвань	Taiwan	0.6	0.8
Ирландия	Ireland	0.6	0.7

Country in Russian	Country in English	2005	2006
Исландия	Iceland	0.5	0.7
Вьетнам	Vietnam	1.0	0.0
Грузия	Georgia	0.8	0.2
Бруней	Brunei	0.0	0.9
Франция	France	0.0	0.3
Франция	France	0.2	0.7
Южно-Африк	Southern-Africa	0.6	0.3
Новая Зеланд	New Zealand	0.0	0.7
Греция	Greece	0.5	0.0
Словения	Slovenia	0.1	0.4
Сингапур	Singapore	0.3	0.0
Брит.терр	Брит.терр	0.3	0.1
Сирия	Syria	0.0	0.3
Индонезия	Indonesia	0.1	0.2
Индия	India	0.2	0.1
Португалия	Portugal	0.1	0.1
Виргин.о.б	Виргин.о.б	0.2	0.0
Мексика	Mexico	0.0	0.2
Австралия	Australia	0.1	0.0
Армения	Armenia	0.1	0.1
Белиз	Belize	0.1	0.0
Ангилья	Anguilla	0.0	0.1
Бангладеш	Bangladesh	0.1	0.0
Тайланд	Thailand	0.0	0.0
Ангола	Angola	0.1	0.0
Уругвай	Uruguay	0.0	0.1
Колумбия	Colombia	0.1	0.0
Лихтенштейн	Liechtenstein	0.0	0.1
Ирак	Iraq	0.0	0.1
Сомали	Somalia	0.0	0.1
Эритрея	Eritrea	0.1	0.0
Монако	Monaco	0.0	0.1
Гондурас	Honduras	0.0	0.1
Андорра	Andorra	0.0	0.1
Американс	American Samoa	0.0	0.0
Панама	Panama	0.0	0.0
Шри-Ланка	Sri Lanka	0.0	0.0
Кипр	Cyprus	0.0	0.0
Македония	Macedonia	0.0	0.0
Марокко	Morocco	0.0	0.0
Кения	Kenya	0.0	0.0
Пакистан	Pakistan	0.0	0.0
Антарктида	Antarctica	0.0	0.0
Гайана	Gyana	0.0	0.0
Саудовская	Saudi Arabia	0.0	0.0
Нигерия	Nigeria	0.0	0.0
Доминикан	Dominican Republic	0.0	0.0
Бермудски	Bermudas	0.0	0.0
Антигуа	Antigua	0.0	0.0
Шпицберге	Spitsbergen	0.0	0.0
Филиппины	Philippines	0.0	0.0
Бутан	Butane	0.0	0.0
Сенегал	Senegal	0.0	0.0
Кококов.о	Кококов.о	0.0	0.0
Sum		8,739.4	10,145.5

Source: KTZ

Appendix 3.1-3 Railway Transit Freight Volumes

Transit Transport Volumes by Arrival Country
Unit:1000 tons

Country in Russian	Country in English	2005	2006
Узбекистан	Uzbekistan	2,381.8	3,157.2
Россия	Russia	1,258.0	1,530.1
Таджикистан	Tajikistan	1,152.3	1,533.0
Кыргызстан	Kyrgyzstan	1,023.1	1,431.0
Китай	China	1,102.7	841.9
Туркменистан	Turkmenistan	383.9	326.3
Афганистан	Afghanistan	299.7	239.9
Нидерланд	The Netherlands	298.2	238.4
Украина	Ukraine	116.8	115.5
Латвия	Latvia	68.8	126.6
Иран	Iran	141.3	33.0
Италия	Italy	21.9	144.1
Турция	Turkey	75.4	60.0
Швейцария	Switzerland	51.7	39.7
Польша	Poland	25.4	57.9
Великобритания	The Great Britain	14.4	54.2
Азербайджан	Azerbaijan	36.4	29.6
Грузия	Georgia	48.6	0.9
США	THE USA	40.8	5.5
Литва	Lithuania	12.6	19.7
Бельгия	Belgium	18.8	12.3
Эстония	Estonia	24.7	6.2
Германия	Germany	16.6	7.7
Беларусь	Belarus	10.6	11.5
Венгрия	Hungary	0.5	19.6
Корея (КНДР)	North Korea	13.1	5.3
Португалия	Portugal	9.9	7.7
Прочие страны	The other countries	14.6	1.3
Франция	France	12.6	1.3
Виргин.ост.	Виргин.ост.	10.9	2.9
Сянган (Гонгконг)	Siangan (Hong Kong)	3.2	7.3
Румыния	Romania	6.4	3.6
Словакия	Slovakia	2.4	7.1
Австрия	Austria	5.2	2.6
Корея	Korea	0.0	7.6
Чехия	Czechia	2.7	3.4
Болгария	Bulgaria	4.4	1.4
Япония	Japan	2.5	3.0
Лихтенштейн	Liechtenstein	5.1	0.0
Сингапур	Singapore	4.3	0.6
Финляндия	Finland	3.2	1.6
Испания	Spain	2.5	2.1
Ангилья	Anguilla	0.0	4.2
Монголия	Mongolia	2.4	0.6
Молдова	Moldova	0.9	1.9
Египет	Egypt	1.4	0.3
Израиль	Israel	0.9	0.6
Виргин.ост.	Виргин.ост.	1.1	0.1

Country in Russian	Country in English	2005	2006
Южно-Африканская Респ.	Southern-african Rep.	0.7	0.5
Бразилия	Brazil	0.1	1.1
Ирландия	Ireland	1.0	0.2
Гибралтар	Gibraltar	1.1	0.0
Индия	India	0.1	1.1
Албания	Albania	0.0	1.1
Тайвань	Taiwan	0.0	1.1
Соломоновы о-ва	Соломон.ост.	0.0	0.9
Брит.террит.	Брит.терр.	0.0	0.8
Канада	Canada	0.6	0.2
Армения	Armenia	0.1	0.6
Дания	Denmark	0.4	0.2
Сирия	Syria	0.4	0.1
Венесуэла	Venezuela	0.1	0.3
Пакистан	Pakistan	0.0	0.4
Греция	Greece	0.3	0.1
Гондурас	Honduras	0.0	0.4
Белиз	Belize	0.0	0.3
Швеция	Sweden	0.1	0.2
Камбоджа	Cambodia	0.1	0.2
Хорватия	Croatia	0.3	0.0
Ангола	Angola	0.0	0.2
Алжир	Algeria	0.1	0.0
Колумбия	Colombia	0.1	0.0
Тунис	Tunis	0.1	0.0
Кипр	Chyprus	0.0	0.1
Габон	Gabon	0.0	0.1
Объед.Араб.	Объед. The Arab States	0.0	0.1
Гвинея-Бисау	Guinea-Bissau	0.0	0.1
Кайман.ост.	Кайман.ост.	0.1	0.0
Югославия	Yugoslavia	0.1	0.0
Уругвай	Uruguay	0.0	0.1
Сенегал	Senegal	0.0	0.1
Катар	Qatar	0.1	0.0
Бруней	Brunei	0.1	0.0
Норвегия	Norway	0.1	0.0
Австралия	Australia	0.0	0.1
Бахрейн	Bahrain	0.0	0.0
Бермудские о-ва	Bermudas	0.0	0.0
Коста-Рика	Costa Rica	0.0	0.0
Марокко	Morocco	0.0	0.0
Куба	Cuba	0.0	0.0
Словения	Slovenia	0.0	0.0
Вьетнам	Vietnam	0.0	0.0
Гаити	Haiti	0.0	0.0
Кения	Kenya	0.0	0.0
Коморские о-ва	Коморск.ост.	0.0	0.0
Руанда	Ruanda	0.0	0.0
Sum		8,741.0	10,119.2

Source: KTZ

Appendix 3.1-4 OD Matrix of Domestic Railway Freight in 2006

Unit: thousand tons

[illegible]

Appendix 3.1-4 OD Matrix of Domestic Railway Freight in 2006 (cont'd)

	Жаңы-Суу	Заткент	Каспийск	Карабас	Карагайлы	Караганда-1	Караганда	Каска-Сай	Кокшетау
Алаш	0	0	0	0	0	0	0	0	0
Алашбай	0	0	65	0	0	0	0	0	0
Алматы	0	0	0	0	0	0	0	0	0
Арма	0	0	0	0	0	0	0	0	0
Аркыстау	0	0	0	0	0	0	0	0	0
Атбасар	0	0	0	0	0	0	0	0	0
Берексур	0	0	0	0	0	0	0	0	0
Бугуль	0	0	0	0	0	0	0	0	0
Бузирова	0	101	0	0	0	0	0	0	0
Васильевск	0	0	0	0	0	0	0	0	0
Давыдов	0	0	0	0	0	0	0	10	0
Давыдовск	0	0	0	0	0	0	0	0	0
Давыдов	0	0	0	0	0	0	0	0	0
Донско	0	0	0	0	0	0	0	0	0
Ермаковск	0	0	0	0	0	0	0	0	0
Жант-Аул	0	0	0	5	0	13	0	0	0
Жант-Салай	0	0	0	0	0	0	0	0	0
Жаңытө	0	0	0	0	0	0	0	0	0
Жоңалган	0	0	0	0	0	0	0	0	0
Жоңалжур	0	0	0	0	0	0	0	1	0
Заткент	0	0	0	0	0	0	0	0	0
Калайир	0	0	0	0	0	0	0	0	0
Карабас	0	0	0	0	0	0	0	0	0
Карагайлы	0	0	0	0	0	0	0	0	0
Караганда-1	0	0	0	0	0	0	0	0	0
Караганда-2	0	0	0	0	0	0	0	0	0
Караганда	0	0	0	0	0	0	0	0	0
Каска-Сай	0	0	0	0	0	0	0	0	0
Кокшетау	0	418	0	0	0	0	0	0	0
Кульсары	0	0	0	0	0	0	0	0	0
Кустайов	0	0	0	0	0	0	0	0	0
Ленинград	0	3	0	0	0	0	0	0	0
Май-Кудук	0	0	0	1	0	0	0	0	0
Майлуу	0	0	0	0	0	0	0	0	0
Муродовск	0	0	0	0	0	0	0	0	0
Муром	0	0	0	0	0	0	0	0	0
Покотинск	0	0	0	0	0	0	0	0	0
Нурисея	0	0	0	0	0	0	0	0	0
Павлодар	0	0	0	0	0	0	0	0	0
Сарыауыл	0	0	0	0	0	3	0	0	0
Сая	0	0	0	0	0	0	0	0	0
Сулейман	0	0	0	0	0	0	0	0	0
Ташкент	0	0	0	0	0	0	82	0	0
Ташкент-Таш	0	0	0	0	0	0	0	0	0
Ташкент	0	0	0	0	0	0	0	0	0
Уштогул	0	613	0	0	0	0	0	0	0
Чайыруу	0	0	0	0	0	0	0	0	4
Чайыруу	0	0	0	0	2083	0	0	0	0
Чарыккан	0	0	0	0	0	0	0	0	0
Рабаткан	0	0	0	0	0	0	0	0	0
ВостокПолон	0	0	0	0	0	0	0	0	0
unknown	232	418	0	0	0	0	0	0	1
Total	232	1553	65	6	2083	16	82	11	5

Appendix 3.1-4 OD Matrix of Domestic Railway Freight in 2006 (cont'd)

	Элиста	Хархислам	Рыбачье	Нижний Полон	Хархон/Попов	unknown	total
Аларт	0	0	0	0	0	33	70
Асанпалан	0	0	90	0	0	1125	1821
Амхата	0	0	49	0	0	53	107
Адан	0	0	0	0	0	36	1953
Ардасингор	0	0	0	0	0	0	1769
Арбонор	0	0	10	0	0	153	163
Берчигур	176	0	0	0	29	651	985
Вугуна	0	0	0	98	0	0	98
Вукхирин	0	0	404	0	0	493	1261
Волхонгорин	0	0	0	0	0	19	80
Давлтыр	0	0	0	0	0	12	136
Донинин	0	0	0	0	0	327	630
Дугуага	0	0	0	0	0	3	576
Дунин	0	0	29	0	0	97	2669
Ерменитлам	0	0	0	0	0	1	58
Жани-Аул	0	0	104	0	0	309	1173
Жани-Самы	0	0	262	0	0	306	1003
Жантчи	0	0	0	0	0	0	772
Жоногорин	0	9	0	0	0	30	181
Жолонорудин	0	0	0	0	0	7	1076
Зандан	0	0	0	0	0	27	382
Калатир	0	0	0	0	0	30	1095
Каробин	0	0	0	0	0	274	1385
Каргайла	0	0	0	0	0	0	1179
Каргайдин-1	0	5	1	0	0	10	100
Каргайдин-2	0	0	344	0	0	65	2487
Каринил	0	0	0	0	0	41	926
Калал-Давар	0	0	209	0	0	3062	4388
Канчинан	0	0	159	0	0	1315	3552
Кульдер	0	0	0	0	0	1	33
Кустиний	0	0	0	0	0	15	37
Лонингорин	0	0	0	0	0	2	177
Май-Будук	0	0	0	0	0	1	44
Майлан	0	0	0	0	0	0	3598
Мугонгорин	0	0	0	0	0	948	1383
Мурал	0	1681	0	0	0	116	2212
Новошпачин	0	0	0	0	0	40	43
Нуринин	0	1112	0	0	0	117	7085
Пилсидар	0	0	95	0	0	71	189
Сарлаури	0	49	0	0	0	0	626
Сам	0	1706	0	0	0	0	1706
Суун-Вулун	0	0	0	0	0	0	1202
Тонсу	0	0	459	0	0	1523	2359
Тонир-Тун	0	0	18	0	0	7	71
Тугу	0	0	0	0	0	0	701
Уингулин	0	0	0	0	0	1186	4725
Уайгурун	0	0	0	5	0	41	54
Шибанон	0	0	0	0	0	4223	31903
Хархислам	0	0	1	0	0	5	6
Рыбачье	0	1	0	0	0	0	5
Нижний Полон	0	0	0	0	0	0	221
unknown	0	293	134	0	0	37439	45251
Total	176	4856	2368	103	29	54214	135716

Appendix 3.1-5 D-O Matrix of Import Container Freight in 2006

Unit : Containers of 20ft+40ft

AS goods	Imported	Imported	EXPORT	EXPORT	EXPORT	EXPORT	EXPORT	EXPORT	EXPORT	EXPORT	EXPORT	EXPORT	EXPORT
AGNADON	10	0	20	5	0	0	0	0	0	0	2	0	0
AGNADON	0	0	2	0	0	0	0	0	0	0	0	0	0
AGNADON	11	0	205	225	0	4	0	0	0	0	227	0	1
AGNADON	0	1	205	224	29	15	0	4	12	0	209	5	2
AGNADON	0	4	15,525	2,509	14	3,579	0	0	1	4,090	108	1,031	
AGNADON	0	7	3,374	478	83	377	0	0	0	885	11	138	
AGNADON	0	0	5	0	0	1	0	0	0	0	0	0	0
AGNADON	0	0	0	0	0	0	0	0	0	0	0	0	0
AGNADON	0	0	1	2	0	5	0	0	0	7	0	0	0
AGNADON	0	0	2,128	0	28	427	0	0	0	0	77	43	
AGNADON	0	0	1	0	0	0	0	0	0	0	0	0	0
AGNADON	41	7	194	181	5	11	0	28	24	514	10	8	
AGNADON	0	0	15	0	0	0	0	0	0	0	0	0	0
AGNADON	0	0	41	4	0	0	0	0	0	39	0	0	0
AGNADON	0	0	0	142	0	0	0	0	0	0	0	0	0
AGNADON	0	0	124	0	0	0	0	0	0	40	0	3	
AGNADON	0	0	0	0	0	0	0	0	0	0	10	0	0
AGNADON	0	0	79	29	3	1	0	0	0	59	0	30	
AGNADON	0	0	0	2	0	0	0	0	0	0	0	0	0
AGNADON	0	0	0	1	0	0	0	0	2	19	0	0	0
AGNADON	0	0	4	0	0	0	0	0	0	0	0	0	0
AGNADON	0	0	13	0	14	11	0	0	0	0	0	3	
AGNADON	0	0	223	0	0	0	0	0	0	1	0	0	0
AGNADON	0	0	1	0	0	0	0	0	0	0	0	0	0
AGNADON	0	0	811	0	0	21	0	0	0	0	0	1	
AGNADON	0	0	1	0	0	0	0	0	0	0	0	0	0
AGNADON	0	0	27	2	8	83	0	0	0	0	0	1	
AGNADON	0	0	7	0	0	0	0	0	0	0	0	0	0
AGNADON	0	0	21	0	0	0	0	0	0	1	0	0	0
AGNADON	0	0	89	82	2	4	0	0	2	202	1	3	
AGNADON	0	0	12	58	0	0	0	0	0	4	0	0	0
AGNADON	0	0	173	3	32	49	0	0	0	0	1	3	
AGNADON	0	0	8	0	0	1	0	0	0	0	0	0	0
AGNADON	0	0	0	1	0	0	0	0	0	0	0	0	0
AGNADON	0	0	0	0	0	0	0	0	0	19	0	0	0
AGNADON	0	0	8	37	0	0	0	0	8	38	0	0	0
AGNADON	0	0	0	26	0	0	0	0	0	0	0	0	0
AGNADON	0	0	8	0	0	0	0	0	0	1	0	0	0
AGNADON	0	0	45	0	0	238	0	0	0	0	0	29	
AGNADON	2	0	201	0	23	50	0	0	0	3	53	57	
AGNADON	0	0	132	91	5	47	0	0	0	80	0	4	
AGNADON	0	0	0	0	0	0	0	0	0	1	0	0	0
AGNADON	0	0	68	0	11	83	0	0	0	0	245	3	
AGNADON	0	0	0	0	0	0	0	0	0	0	0	0	0
AGNADON	4	1	18	15	0	5	0	0	0	515	2	0	
AGNADON	0	0	0	177	0	0	0	0	0	34	0	0	0
AGNADON	0	0	183	0	18	12	0	0	0	0	0	23	
AGNADON	0	0	0	0	0	0	0	0	0	1	0	0	0
AGNADON	0	0	7	0	4	1	0	0	0	0	0	0	0
AGNADON	0	0	0	0	0	0	0	0	0	0	0	0	0
AGNADON	31	0	250	341	13	38	0	0	97	353	0	27	
AGNADON	0	0	8	0	0	6	0	30	0	0	0	0	0
AGNADON	0	3	3,371	224	0	128	1	0	0	1,113	1	14	
AGNADON	0	0	0	0	0	0	0	0	0	0	0	0	0
AGNADON	0	0	108	0	0	0	0	0	0	0	0	0	0
AGNADON	0	0	1	0	0	0	0	0	0	0	0	0	0
AGNADON	0	0	0	0	0	0	0	0	0	0	0	0	0
AGNADON	11	0	414	0	208	31	0	0	0	1	5	7	
AGNADON	0	0	44	0	5	26	0	0	0	0	0	0	0
AGNADON	0	0	5	5	0	0	0	0	0	0	0	7	
AGNADON	0	0	0	0	0	0	0	0	0	1	0	0	0
AGNADON	0	0	21	72	0	0	0	0	0	0	0	1	
AGNADON	0	0	0	0	0	0	0	0	0	0	0	0	0
AGNADON	0	0	1	0	0	0	0	0	0	0	0	0	0
AGNADON	0	0	127	0	0	0	0	0	0	0	0	0	0
AGNADON	0	0	0	0	4	7	0	0	0	0	0	0	0
AGNADON	0	0	0	0	0	15	0	0	0	0	0	0	0
AGNADON	0	0	5	0	0	0	0	0	0	0	0	3	
AGNADON	0	0	0	0	0	0	0	0	0	0	23	0	
AGNADON	0	0	175	30	0	108	0	0	0	184	0	89	
AGNADON	0	0	5	0	0	0	0	0	0	0	0	0	0
AGNADON	0	0	0	0	0	0	0	0	0	0	0	0	0
AGNADON	0	0	4	1	0	1	0	0	0	5	0	18	
AGNADON	0	0	5	10	3	1	0	1	0	44	0	0	0
AGNADON	0	0	0	0	0	0	0	0	0	63	0	0	0
AGNADON	0	0	7	0	0	0	0	0	0	0	0	0	0
AGNADON	0	0	0	0	0	0	0	0	0	1	0	0	0
AGNADON	0	0	1,157	295	13	319	0	0	0	317	0	81	
AGNADON	0	0	0	0	0	0	0	0	0	8	0	0	0
AGNADON	0	0	0	0	0	0	0	0	0	0	0	0	0
AGNADON	0	0	0	0	0	0	0	0	0	3	0	0	0
AGNADON	0	0	5	0	0	0	0	0	0	0	0	0	0
AGNADON	110	23	31,041	3,493	675	3,771	1	91	145	10,292	811	1,621	

Appendix 3.1-5 D-O Matrix of Import Container Freight in 2006 (cont'd)

All goods	Import	Export	Total
AFRICA	0	0	47
AFRICA	0	0	2
AFRICA	0	0	1,044
AFRICA	0	3	1,280
AFRICA	154	4	28,817
AFRICA	21	2	5,400
AFRICA	12	0	18
AFRICA	8	0	8
AFRICA	0	0	15
AFRICA	1,224	1	3,928
AFRICA	0	0	1
AFRICA	0	1	1,082
AFRICA	129	0	141
AFRICA	0	0	84
AFRICA	0	0	142
AFRICA	0	0	162
AFRICA	7	0	17
AFRICA	0	0	201
AFRICA	0	0	2
AFRICA	0	0	22
AFRICA	0	0	4
AFRICA	92	0	133
AFRICA	0	0	394
AFRICA	0	0	1
AFRICA	59	0	622
AFRICA	0	0	1
AFRICA	82	0	208
AFRICA	0	0	7
AFRICA	0	0	22
AFRICA	0	0	385
AFRICA	0	0	74
AFRICA	199	0	1,053
AFRICA	38	0	43
AFRICA	0	0	1
AFRICA	0	0	19
AFRICA	0	0	53
AFRICA	0	0	36
AFRICA	0	0	9
AFRICA	15	0	331
AFRICA	1,728	0	2,419
AFRICA	0	0	329
AFRICA	0	0	1
AFRICA	385	0	845
AFRICA	32	0	32
AFRICA	0	0	560
AFRICA	0	0	211
AFRICA	582	0	818
AFRICA	0	0	1
AFRICA	47	0	50
AFRICA	9	0	9
AFRICA	0	0	1,170
AFRICA	0	0	44
AFRICA	11	1	4,812
AFRICA	1	0	1
AFRICA	43	0	151
AFRICA	0	0	1
AFRICA	0	0	9
AFRICA	1,082	0	1,872
AFRICA	2	0	78
AFRICA	0	0	12
AFRICA	0	0	1
AFRICA	0	2	46
AFRICA	8	0	8
AFRICA	0	0	1
AFRICA	23	0	160
AFRICA	0	0	11
AFRICA	73	0	90
AFRICA	0	0	11
AFRICA	0	0	29
AFRICA	7	0	542
AFRICA	0	0	5
AFRICA	4	0	4
AFRICA	0	0	27
AFRICA	0	0	84
AFRICA	0	0	83
AFRICA	1	0	8
AFRICA	0	0	1
AFRICA	0	0	2,182
AFRICA	0	0	8
AFRICA	10	0	10
AFRICA	0	0	3
AFRICA	0	0	6
Total	8,680	21	82,497

Appendix 3.1-6 OD Matrix of Import Container Freight in 2006

Unit : Containers of 20ft+40ft

All goods	Алматы Almaty	Астана Astana	Достық Dostyk	Жезкент Zhezkent	Жолто Jolto	Жулы July	Жулы July	Жулы July	Жулы July	Жулы July	Жулы July	Жулы July	Жулы July	Жулы July	Total
АКТОБ	0	0	0	0	0	0	0	0	0	0	0	1,672	0	1,672	
АКТОБ	0	0	0	0	0	0	0	0	0	0	7	0	0	7	
АКТОБ	0	1	10	0	0	2	0	0	29	8	0	0	5	53	
АЛМА-АТА_1	17	1	105	0	46	2	0	0	179	146	98	0	0	562	
АЛМА-АТА_2	0	0	0	41	5	0	0	0	279	28	12	0	2	367	
АТТЕЙНТАС	0	0	18	0	0	0	0	0	0	0	0	117	0	135	
АСТАНА	0	0	16	0	0	0	0	0	0	1	5	40	0	62	
АТРАС	0	0	1	0	0	0	0	0	5	0	0	0	0	6	
БАЛАШ_1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
ДРАМЕНУЛ	0	0	0	7	2	0	0	0	267	8	3	0	0	268	
КОУТЯЕ	0	0	0	1	0	15	0	0	0	1	36	0	0	53	
КОУТЯЕ	0	0	0	0	0	0	0	0	0	0	4	0	0	4	
КОУТЯЕ	0	0	0	3	0	0	0	0	0	3	0	5	0	11	
ЖАКШЕМАБ	0	0	4	0	0	0	0	0	0	0	0	0	0	4	
ЖАНАТАУ	0	0	80	0	0	0	0	0	0	0	0	0	0	80	
ЖОЗЖАҚАН	0	0	0	8	0	0	0	0	0	10	0	34	0	52	
ЖЕЛДІБЕГ	0	0	2	1	0	0	0	0	7	0	0	0	0	10	
ЖЕЖІНІК	2	0	0	0	0	4	157	0	782	0	7	0	0	852	
ЗАПІРТА	0	0	142	1	16	0	0	0	0	6	3	80	0	248	
СЫРЖЫНОВС	0	0	0	0	0	0	0	0	0	0	0	2	0	2	
КАЗАҚСТАН	0	0	28	0	0	0	0	22	0	0	0	0	0	48	
КАРАҒАНДЫ	0	0	2	7	0	0	0	0	0	12	1	399	0	421	
КОҒАЛ-ОҒДА	0	0	1	0	0	0	0	0	1	1	0	0	0	3	
КОҚШЕТАУ	0	0	0	0	1	0	0	0	0	1	24	14	0	40	
КОРЖЫНОВО	0	0	416	0	1,197	0	0	0	0	0	0	0	0	1,613	
ҚОСТАНАЙ	0	0	0	1	9	0	0	0	0	6	0	35	0	51	
МАҒЫНЛАБ	0	0	0	1	1	2	0	0	49	3	0	0	0	56	
НАУЛОДАР-ӘЗ	0	0	0	10	2	0	0	0	0	2	0	26	0	42	
СЕМОНПАЛАТ	0	0	0	4	0	0	0	0	0	6	1	19	0	30	
ТАЛДЫ-ҚОҒА	0	0	2	3	1	0	0	0	12	8	1	0	0	25	
ТОРАТАМ	0	0	0	0	0	0	0	0	10	0	0	0	0	10	
ЧИЗЖЕНТ	0	0	10	4	28	1	0	0	227	9	4	0	0	263	
Total	19	2	845	82	1,308	26	157	22	1,847	258	204	2,448	7	7,231	

Appendix 3.1-7 OD Matrix of Transit Container Freight in 2006

Unit : Containers of 20ft+40ft

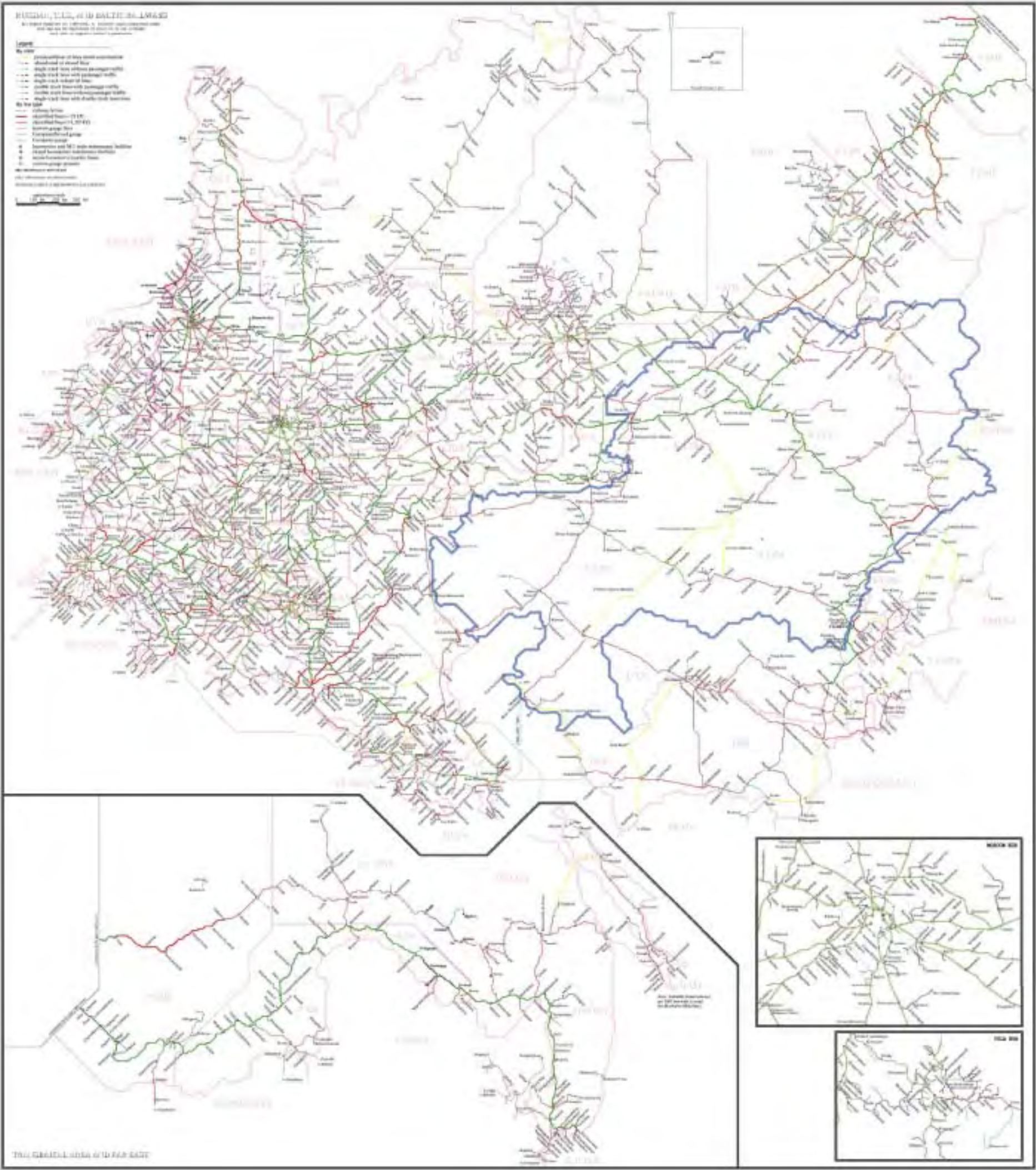
All goods	Алматы	Достык	Жезкент	Жолто	Жулы	Жулы	Жулы	Жулы	Жулы	Жулы	Жулы	Жулы	Total
Алматы	0	0	0	0	0	0	0	1006	0	0	0	0	1006
Астана	0	0	0	0	0	148	120	0	0	53	0	0	321
Достык	68	0	7	10	74	1090	0	42	21	14621	17	0	15950
Жезкент	0	0	0	0	0	1045	938	0	0	3125	0	0	5108
Жолто	0	0	0	0	0	26	0	0	0	65	0	0	91
Жулы	0	3	0	0	0	728	0	0	3	3008	0	0	3742
Жулы	0	19	10	0	74	0	0	302	0	38	6	0	449
Жулы	858	0	20	0	0	0	0	228	3	0	0	0	1109
Жулы	0	9	0	0	0	795	1056	0	0	1835	0	0	3695
Жулы	0	0	0	0	0	0	0	0	0	4	0	0	4
Жулы	0	438	208	2	715	358	0	3432	2	0	0	2	5155
Жулы	0	0	0	0	0	33	0	0	0	0	0	0	33
Жулы	0	0	0	0	0	0	1	0	0	4	0	0	5
Total	926	467	245	12	863	4223	3121	4004	29	22753	23	2	36668

Appendix 3.1-8 Summary of Railway Freight Tracing Survey Result

Train Operation Section	Route Length (km)	of which single track length	Train running speed (km/h)	Commercial speed (km/h)	Total time	Train Running time	Number of Stops	Total Stop time	Maximum Waiting time (stop)	Average Waiting time (stop)	Commodity	Weight (kg)
Container Freight												
Dostyk - Pavlodar	1,150	1,122	33.92	32.2	1 d 11 h 44 m	1 d 9 h 54 m	3	1 h 50 m	0 h 50 m	0 h 37 m	Clothes	14,000
Dostyk - Lugovaya	1,300	868	34.90	32.2	1 d 16 h 25 m	1 d 13 h 15 m	4	3 h 10 m	0 h 59 m	0 h 47 m	Clothes	9,100
Dostyk - Sary-Agash	1,886	868	36.80	33.9	2 d 7 h 34 m	2 d 3 h 15 m	6	4 h 19 m	0 h 59 m	0 h 43 m	Clothes	14,500
Dostyk - Aktan	3,825	2,588	35.52	33.5	4 d 18 h 7 m	4 d 11 h 42 m	8	6 h 25 m	1 h 52 m	0 h 48 m	Lumber	10,500
Dostyk - Lugovaya	1,300	868	34.90	31.6	1 d 17 h 8 m	1 d 13 h 15 m	4	3 h 53 m	1 h 42 m	0 h 58 m	Clothes	16,578
Dostyk - Sary-Agash	1,886	868	42.22	22.2	3 d 13 h 4 m	1 d 20 h 40 m	6	1 d 16 h 24 m	1 d 11 h 44 m	6 h 44 m	Office equip	9,000
Dostyk - Lugovaya	1,300	868	34.90	31.4	1 d 17 h 28 m	1 d 13 h 15 m	4	4 h 13 m	2 h 8 m	1 h 3 m	Lumber	16,000
Wagon Freight												
Dostyk - Pavlodar	1,150	1,122	35.06	32.8	1 d 11 h 3 m	1 d 8 h 48 m	3	2 h 15 m	0 h 50 m	0 h 45 m	steel	49,000
Dostyk - Pavlodar	1,150	1,122	36.51	34.8	1 d 9 h 0 m	1 d 7 h 30 m	2	1 h 30 m	0 h 50 m	0 h 45 m	Coke	56,000
Dostyk - Pavlodar	1,150	1,122	35.71	34.0	1 d 9 h 48 m	1 d 8 h 12 m	2	1 h 36 m	0 h 55 m	0 h 48 m	Coke	60,000
Dostyk - Pavlodar	1,150	1,122	34.33	32.4	1 d 11 h 28 m	1 d 9 h 30 m	3	1 h 58 m	0 h 55 m	0 h 39 m	Coke	60,000
Dostyk - Pavlodar	1,150	1,122	34.33	32.4	1 d 11 h 28 m	1 d 9 h 30 m	3	1 h 58 m	0 h 55 m	0 h 39 m	Coke	60,000
Dostyk - Pavlodar	1,150	1,122	33.92	32.2	1 d 11 h 44 m	1 d 9 h 54 m	3	1 h 50 m	0 h 50 m	0 h 37 m	Coke	60,000
Dostyk - Almaty I	868	868	33.58	31.5	1 d 3 h 32 m	1 d 1 h 51 m	2	1 h 41 m	0 h 52 m	0 h 51 m	Tile	47,244
Dostyk - Lugovaya	1,300	868	31.52	28.4	1 d 21 h 45 m	1 d 17 h 15 m	4	4 h 30 m	1 h 47 m	0 h 54 m	Coke	53,000
Dostyk - Lugovaya	1,300	868	31.52	28.3	1 d 22 h 0 m	1 d 17 h 15 m	5	4 h 45 m	2 h 3 m	0 h 57 m	Coke	56,000
Dostyk - Lugovaya	1,300	868	31.52	28.5	1 d 21 h 38 m	1 d 17 h 15 m	5	4 h 23 m	1 h 42 m	0 h 53 m	Coke	60,000
Dostyk - Lugovaya	1,300	868	31.52	28.3	1 d 21 h 55 m	1 d 17 h 15 m	5	4 h 40 m	2 h 8 m	0 h 56 m	Coke	53,000
Dostyk - Lugovaya	1,300	868	32.22	28.9	1 d 20 h 55 m	1 d 16 h 21 m	5	4 h 34 m	1 h 48 m	0 h 55 m	Coke	53,000

Source: Railway Freight Tracing Survey by Study team

APPENDIX 3-2 Railway Map of Russia and CIS Countries



Appendix 4.1.3-1 Table China-Kazakhstan Trade 2003 -2005

(Unit:US\$1,000)

Classification of commodities	Export			Import		
	2003	2004	2005	2003	2004	2005
						2005/04 (%)
Animal and animal products (Meat, fish etc.)	141	3,505	13,453	787	784	551
Vegetables (vegetables, Fruits and cereal etc)	17,345	10,452	21,251	6,090	5,899	4,108
Oil	30	2	511	-	64	N/A
Foods, beverage, Alcohols, Vinegar, Tobacco etc	17,644	17,594	19,030	1,482	2,092	493
Mineral products	21,470	77,859	72,834	345,441	575,556	834,390
Chemical and related products	45,725	50,605	65,124	46,841	113,728	145,200
Plastic, rubber and related products	97,157	159,292	242,925	52.5	809	1,041
Fur and leather products	24,485	29,972	92,279	37,898	54,463	45,766
Wood and related products, cork etc	770	2,278	9,266	416	306	21
Pulp based on fiber, Wasted or scrapd paper/board	9,870	6,186	16,673	-	0	N/A
Materials for textile and textile products	1,693,349	906,766	1,158,879	18,356	22,059	17,594
Shoes, Umbrellas, hats, down products, artificial floor etc	230,903	303,021	709,483	-	N/A	N/A
Mineral based, ceramic and glass based products	160,311	66,917	179,999	1	N/A	0
Precious stones, products and accessories	3,556	0	23	-	N/A	N/A
Metal and metal based products	320,544	129,470	334,586	1,263,124	1,510,258	1,858,505
Machine, electric appliances and parts	1,535,378	268,751	498,700	220	57	1,693
Vehicles, ships and transportation facilities	141,896	58,003	2,081	477	N/A	22
Optical, medical equipments and musical equipments	86,003	33,427	40,838	2	N/A	49
Arms, ammo and related parts	1,977	N/A	N/A	-	N/A	N/A
Miscellaneous goods	294,746	89,782	309,187	27	2	40
Arts and antique goods	19	18	22	-	N/A	N/A
Special category or unclassified products	706	4	967	-	211	N/A
Total	4,704,025	2,211,935	3,900,931	1,721,475	2,286,291	2,909,366

Prepared from JTERO, 'China External Trade Statistics 2003 & 2005'

Appendix 4.1.3-2 Table China-Iran Trade 2003 -2005

(Unit: US\$1,000)

Classification of commodities	Export				Import			
	2003	2004	2005	2005/04 (%)	2003	2004	2005	2005/04 (%)
Animal and animal products (Meat, fish etc)	867	607	596	-1.8	2,929	837	1,647	96.8
Vegetables (vegetables, Fruits and cereal etc)	173,803	4,056	133,969	3,203.0	13,462	18,310	14,145	-27.7
Oil and related products	99	357	144	-59.7	N/A	0	3	N/A
Food, beverage, Alcohols, Vinegar, Tobacco etc	3,115	4,650	13,637	193.3	172	8	0	N/A
Mineral products	104,578	89,499	98,752	10.3	3,108,117	4,235,173	6,428,807	51.8
Chemical and related products	183,126	233,891	264,294	13.0	67,575	109,706	172,756	57.5
Plastic, rubber and related products	41,099	60,498	100,617	66.3	39,874	35,032	63,933	82.5
Fur and leather products	3,644	7,449	9,619	29.1	1,263	2,400	2,934	22.3
Wood and related products, cork etc	1,086	3,762	8,122	115.9	N/A	N/A	1	N/A
Pulp based on fiber, Waxed or scraped paper/board	14,707	12,818	42,513	231.7	139	1	42	4,100.0
Materials for textile and textile products	422,183	513,173	505,193	-1.6	32,90	2,557	10,551	312.6
Shoes, Umbrellas, hats, down products, artificial flour etc	17,400	17,619	23,448	33.1	N/A	N/A	N/A	N/A
Mineral based, ceramic and glass based products	36,358	55,799	71,757	28.6	87	209	314	50.2
Precious stones, products and accessories	175	363	1,352	272.5	1	N/A	N/A	N/A
Metal and metal based products	120,475	252,630	373,300	47.8	37,068	85,993	91,079	5.9
Machine, electric appliances and parts	702,410	741,344	981,826	32.4	484	489	1,123	129.7
Vehicles, ships and transportation facilities	382,915	386,621	478,703	23.8	8	445	12	-97.3
Optical, medical equipments and musical equipments	32,333	49,652	57,136	15.1	2	389	34	-91.3
Arms, ammo and related parts	2,088	127	119	-6.3	N/A	N/A	N/A	N/A
Miscellaneous goods	20,179	41,468	68,034	64.1	1	2	1	-50.0
Arts and antique goods	19	16	34	112.5	12	0	N/A	N/A
Special category or unclassified products	52,880	78,313	63,489	-19.0	1	N/A	N/A	N/A
Total	2,315,538	2,554,711	3,296,545	29.0	3,346,421	4,491,553	6,787,382	51.1

Prepared from JTERO, "China External Trade Statistics 2003 & 2005"

Appendix 5-1: Estimation Result of Transit Potential (including ocean route and other routes)

1 Russia (– Iran)

Weight (ton)

Import	2005	2010	2017	2017/2005
Total	556,153	765,431	1,164,357	2.09
10	0	0	0	
25&26	212,996	226,981	248,117	1.16
27	74	107	178	2.41
72&73	790	1,141	1,906	2.41
GC	342,292	537,202	914,156	2.67
Export	2005	2010	2017	2017/2005
Total	3,898,557	5,091,205	7,295,733	1.87
10	110,881	171,682	303,350	2.74
25&26	68,074	36,231	14,356	0.21
27	1,278,875	1,397,617	1,516,264	1.19
72&73	2,098,434	2,948,474	4,547,608	2.17
GC	342,292	537,202	914,156	2.67

2 Russia (– Kyrgyz)

Weight (ton)

Import	2005	2010	2017	2017/2005
Total	286,354	378,249	529,445	1.85
10	6	4	2	
25&26	33,701	41,888	56,793	1.69
27	53,319	59,841	70,335	1.32
72&73	744	752	764	1.03
GC	198,584	275,765	401,551	2.02
Export	2005	2010	2017	2017/2005
Total	1,420,589	2,435,038	5,193,775	3.66
10	12	21	44	3.63
25&26	52,284	70,467	106,306	2.03
27	1,136,382	2,043,868	4,618,111	4.06
72&73	33,328	44,918	67,764	2.03
GC	198,584	275,765	401,551	2.02

3 Russia (- Tajikistan)

Weight (ton)

Import	2005	2010	2017	2017/2005
Total	158,115	253,561	475,072	3.00
10	89	90	92	
25&26	164	95	44	0.27
27	0	0	0	
72&73	0	0	0	
GC	157,862	253,375	474,936	3.01
Export	2005	2010	2017	2017/2005
Total	550,959	965,537	2,070,728	3.76
10	123	152	198	1.61
25&26	5,576	10,175	23,004	4.13
27	357,084	651,549	1,473,091	4.13
72&73	30,313	50,286	99,500	3.28
GC	157,862	253,375	474,936	3.01

4 Russia (- Turkmenistan)

Weight (ton)

Import	2005	2010	2017	2017/2005
Total	271,558	309,626	372,648	1.372
10	0	0	0	
25&26	2,453	5,163	14,635	5.967
27	112,965	120,382	131,592	1.165
72&73	0	0	0	0.699
GC	156,140	184,081	226,421	1.450
Export	2005	2010	2017	2017/2005
Total	318,105	349,463	434,329	1.365
10	1	1	1	0.571
25&26	65,178	36,650	16,262	0.249
27	3,425	3,204	2,898	0.846
72&73	93,361	125,528	188,747	2.022
GC	156,140	184,081	226,421	1.450

5 Russia (- Uzbekistan)

Weight (ton)

Import	2005	2010	2017	2017/2005
Total	647,748	1,007,545	1,804,672	2.79
10	502	877	1,919	
25&26	799	897	1,055	1.32
27	2,300	3,159	4,927	2.14
72&73	296	368	499	1.69
GC	643,851	1,002,243	1,796,272	2.79
Export	2005	2010	2017	2017/2005
Total	1,028,908	1,616,466	2,945,778	2.86
10	1,106	1,230	1,380	1.25
25&26	67,947	97,194	155,013	2.28
27	23,046	31,381	46,714	2.03
72&73	292,958	484,418	946,398	3.23
GC	643,851	1,002,243	1,796,272	2.79

6 Russia (- Turkmenistan)

Weight (ton)

Import	2005	2010	2017	2017/2005
Total	271,558	309,626	372,648	1.372
10	0	0	0	
25&26	2,453	5,163	14,635	5.967
27	112,965	120,382	131,592	1.165
72&73	0	0	0	0.699
GC	156,140	184,081	226,421	1.450
Export	2005	2010	2017	2017/2005
Total	318,105	349,463	434,329	1.365
10	1	1	1	0.571
25&26	65,178	36,650	16,262	0.249
27	3,425	3,204	2,898	0.846
72&73	93,361	125,528	188,747	2.022
GC	156,140	184,081	226,421	1.450

7 Russia (- Uzbekistan)

Weight (ton)

Import	2005	2010	2017	2017/2005
Total	647,748	1,007,545	1,804,672	2.79
10	502	877	1,919	
25&26	799	897	1,055	1.32
27	2,300	3,159	4,927	2.14
72&73	296	368	499	1.69
GC	643,851	1,002,243	1,796,272	2.79
Export	2005	2010	2017	2017/2005
Total	1,028,908	1,616,466	2,945,778	2.86
10	1,106	1,230	1,380	1.25
25&26	67,947	97,194	155,013	2.28
27	23,046	31,381	46,714	2.03
72&73	292,958	484,418	946,398	3.23
GC	643,851	1,002,243	1,796,272	2.79

8 China (- Azerbaijan)

Weight (ton)

Import	2005	2010	2017	2017/2005
Total	225,185	398,701	739,106	3.28
10	0	0	0	
25&26	3	4	7	2.46
27	1	2	2	1.33
72&73	0	0	0	
GC	225,181	398,695	739,097	3.28
Export	2005	2010	2017	2017/2005
Total	230,488	412,169	781,290	3.39
10	0	0	0	
25&26	71	38	13	0.19
27	618	1,463	4,096	6.63
72&73	4,619	11,973	38,083	8.25
GC	225,181	398,695	739,097	3.28

9 China (- Iran)

Weight (ton)

Import	2005	2010	2017	2017/2005
Total	49,546,396	87,149,675	174,241,740	3.52
10	0	0	0	
25&26	5,135,678	9,481,747	20,222,237	3.94
27	41,472,381	72,957,331	145,424,295	3.51
72&73	158,456	292,549	623,934	3.94
GC	2,779,881	4,418,048	7,971,274	2.87
Export	2005	2010	2017	2017/2005
Total	4,903,064	7,097,653	11,817,909	2.41
10	647,844	543,389	407,015	0.63
25&26	574,966	807,875	1,246,034	2.17
27	529,269	780,843	1,289,463	2.44
72&73	371,104	547,498	904,124	2.44
GC	2,779,881	4,418,048	7,971,274	2.87

10 China (- Turkmenistan)

Weight (ton)

Import	2005	2010	2017	2017/2005
Total	83,423	143,899	306,207	3.67
10	0	0	0	
25&26	0	0	0	
27	0	0	0	
72&73	137	252	538	3.94
GC	83,286	143,647	305,669	3.67
Export	2005	2010	2017	2017/2005
Total	97,067	162,740	336,913	3.47
10	0	0	0	
25&26	3,219	3,529	3,987	1.24
27	4,797	6,134	8,596	1.79
72&73	5,765	9,431	18,660	3.24
GC	83,286	143,647	305,669	3.67

11 China (- Uzbekistan)

Weight (ton)

Import	2005	2010	2017	2017/2005
Total	452,845	848,139	1,946,504	4.30
10	0	0	0	
25&26	16,822	23,075	32,466	1.93
27	216,748	461,316	1,200,584	5.54
72&73	117	105	81	0.69
GC	219,158	363,644	713,373	3.26
Export	2005	2010	2017	2017/2005
Total	246,699	403,861	779,459	3.16
10	0	0	0	
25&26	9,200	13,160	20,989	2.28
27	11,478	17,239	29,437	2.56
72&73	6,864	9,819	15,660	2.28
GC	219,158	363,644	713,373	3.26

Appendix 5-2 Future Railway Freight Origin Destination Table

Year 2010

Unit: 1000 ton

Destination Origin		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Departure total	
		алматы	семипала	павлодар	кокшетау	астана	карагайлы	тараз	шымкент	кызылорда	костанай	кандыагаш	уральск	атырау	актау	достык	Other Border		
		almaty	semipalatinsk	pavlodar	kokshetau	astana	karagaily	taraz	shymkent	kyzylorda	kostanai	kandyagas	uralsk	atyrau	aktau	dostyk			
1	алматы	almaty	1,346	781	3,627	108	114	3,463	1,609	1,034	137	567	237	72	249	288	3,268	3,976	20,876
2	семипалатинск	semipalatinsk	184	133	5,513	35	45	808	50	48	9	159	48	13	48	58	710	1,006	8,867
3	павлодар	pavlodar	864	4,863	13,026	419	724	8,864	319	294	63	1,489	425	121	416	490	3,108	9,977	45,462
4	кокшетау	kokshetau	234	299	3,978	226	566	3,915	133	117	29	2,815	273	68	236	232	556	6,441	20,118
5	астана	astana	240	421	7,206	543	94	6,829	139	124	26	971	190	46	160	170	563	2,399	20,121
6	карагайлы	karagaily	1,417	1,195	14,211	721	1,209	8,381	810	709	139	2,583	683	201	682	775	3,311	7,688	44,715
7	тараз	taraz	800	101	700	34	37	1,004	289	1,739	93	168	99	29	96	101	395	2,953	8,638
8	шымкент	shymkent	369	75	481	25	25	651	1,278	357	159	128	114	31	103	98	245	8,184	12,323
9	кызылорда	kyzylorda	64	15	121	6	6	156	88	219	22	68	79	17	59	50	70	798	1,838
10	костанай	kostanai	227	233	2,365	504	171	2,517	117	110	51	1,055	700	152	498	450	584	18,105	27,839
11	кандыагаш	kandyagas	83	64	588	49	32	568	71	110	58	705	198	261	937	419	140	1,582	5,865
12	уральск	uralsk	136	73	998	67	45	901	112	158	65	805	1,389	381	705	495	219	3,740	10,289
13	атырау	atyrau	334	269	2,401	168	113	2,243	271	402	164	1,947	3,668	509	3,713	3,700	544	10,830	31,276
14	актау	aktau	172	131	1,175	71	50	1,106	130	183	69	732	771	176	1,777	2,997	307	2,499	12,346
15	достык	dostyk	366	299	1,287	25	26	845	89	83	15	135	53	18	48	55	0	718	4,062
16	Other Border		447	360	3,647	395	136	2,265	675	2,641	196	5,038	653	457	1,579	640	2,100	10,298	942
Arrival total			7,283	9,312	61,324	3,396	3,393	44,516	6,180	8,328	1,295	19,365	9,580	2,552	11,306	11,018	16,120	1,408	306,162

Year 2017

Destination Origin		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Departure Total	
		алматы almaty	семипалатинск semipalatinsk	павлодар pavlodar	коқшетау kokshetau	астана astana	карағайлы karagaily	тараз taraz	шымкент shymkent	қызылорда kyzylorda	костанай kostanai	кандыағаш kandyagash	уральск uralsk	атырау atyrau	актау aktau	достык dostyk	Border node		
1	алматы	almaty	2,496	1,405	5,234	200	213	5,553	2,883	1,532	233	798	411	125	351	521	4,400	4,857	31,212
2	семипалатинск	semipalatinsk	387	261	8,772	71	94	1,436	101	78	18	251	93	26	75	117	1,080	1,460	14,320
3	павлодар	pavlodar	1,346	7,281	15,595	650	1,142	11,827	478	363	91	1,743	611	175	489	738	3,525	11,581	57,635
4	коқшетау	kokshetau	380	467	4,884	363	928	5,379	208	150	43	3,395	407	105	289	362	660	7,649	25,669
5	астана	astana	377	637	8,727	852	150	9,219	211	155	37	1,154	277	67	191	259	645	2,707	25,665
6	карағайлы	karagaily	2,305	1,871	17,725	1,164	1,982	11,652	1,269	916	207	3,155	1,029	304	838	1,219	3,915	8,757	58,308
7	тараз	taraz	1,601	196	1,074	67	74	1,715	559	2,771	171	252	184	54	145	196	576	3,715	13,350
8	шымкент	shymkent	799	155	782	52	53	1,184	2,656	612	315	205	226	62	167	204	386	11,313	19,171
9	қызылорда	kyzylorda	128	28	183	13	12	264	169	346	40	101	146	31	89	98	102	1,029	2,779
10	костанай	kostanai	377	370	2,910	826	286	3,482	186	143	77	1,275	1,049	236	619	713	711	21,842	35,102
11	кандыағаш	kandyagash	158	120	856	94	60	922	130	167	102	1,003	351	464	1,349	771	193	2,093	8,833
12	уральск	uralsk	277	144	1,549	136	91	1,562	221	258	124	1,228	2,620	728	1,087	974	326	5,052	16,377
13	атырау	atyrau	579	453	3,202	289	197	3,332	455	557	262	2,538	5,929	820	4,874	6,216	686	13,253	43,642
14	актау	aktau	289	214	1,543	118	85	1,609	211	247	107	935	1,223	273	2,265	4,912	373	2,910	17,314
15	достык	dostyk	666	532	1,865	44	48	1,354	156	121	26	189	93	30	67	100	0	1,102	6,393
16	Other Node		822	649	5,446	734	260	3,681	1,202	3,864	331	7,472	1,147	740	2,257	1,158	3,228	15,418	1,454
Arrival Total			12,987	14,783	80,347	5,673	5,675	64,171	11,095	12,280	2,184	25,694	15,796	4,240	15,152	18,558	20,806	1,765	424,179

Appendix 8.1.1-1(1):Comments on the Logistics marketing from related corporations and economic bodies.

- One of the major export items from Japan to Kazakhstan has been a second-hand car. Actually, 11,140 second-hand cars were exported in containers from Japan to Kazakhstan in 2005. The number of second-hand cars, which was exported from Japan to Kazakhstan in 2004, is 5,276 cars. The number of cars exported from Japan to Kazakhstan in 2005 (11,140 cars) increased by 111 % against that in 2004 (5,276 cars). A ban on import of cars with a right handle from January, 2007 in Kazakhstan will adversely affect the number of cars to be exported from Japan to Kazakhstan. However, more efficient arrangement of transportation system of railway in Kazakhstan will lead to shorter transit time of transportation by rail, which will strengthen competitiveness and expand trades of other commodities such as sophisticated goods (electric goods etc) with high value from Japan. In order to increase trades with Kazakhstan, development of transportation system of railway; in particular, more development of Dostyk station, including sufficient supply of platforms and facilities to reload containers must be considered.
- Japanese corporations have not sufficiently implemented marketing to Kazakhstan. One of the crucial issues to be considered is a lack of information; namely, Japanese corporations lack information on railway system or customs clearance system and so forth, in Kazakhstan. Kazakhstan also has not provided these corporations with sufficient marketing information, including information on transportation system by rail, which will lead to more trade expansion. More positive marketing, including useful information provision from Kazakhstan will be very beneficial.
- In pursuit of more oil production from a daily production of 1.3 million barrels in 2005 to 3.0 million barrels in 2015, a great deal of investment has been implemented in various regions such as Tegniz, Kashagan, and Karachaganak. In particular, in Tengiz area, investment to increase a daily production from 270,000 barrels in 2004 to 450,000 barrels in 2006 and 700,000 barrels in the long term is designed. Similarly, in Kashagan area, investment so as to commence oil production in 2008 and to produce 450,000 barrels of oil in 2010 has been implemented. If these plant constructions are materialized, it seems that efficient transportation system of railway to connect the east and the west of Kazakhstan seems to be very important, in order to transport materials or equipments from the east. For that purpose, various activities in terms of soft and hard items, such as improvement of facilities or a block train formation to pursue more efficiency in railway transportation system in Kazakhstan, will be necessary.
- A block train formation has been already established between Lianyungang, China and Dostyk. If a block train is arranged between Dostyk and western area of Kazakhstan (for example, Aktau), in terms of transit time, it will be enormously beneficial to marketing and it will enable to provide corporations which are located in East Asian countries with competitive transportation routes.
- Many of oil and gas construction materials and equipments in an area of Caspian Sea in Kazakhstan are mainly imported from Europe or USA. These are transported by sea, by rail or overland by truck, depending on the type of cargo (volume, size, weight and so forth). When it comes to transporting such oil and gas construction materials and equipments, the most important element, more so than transportation cost, is a just-in-time delivery. Therefore, many of cargoes are transported not by rail but by truck or sea because transportation by truck or sea is more accurate in cargo delivery than that by rail. If more efficient transportation system by rail from East Asian

countries (shorter transit times and stable, accurate transportation schedules) is established, it seems that it will become possible to seek supply sources of oil and gas construction materials and equipments in these East Asian countries.

-At Aktau, many materials used for construction of general buildings and so on, are imported from European countries (Germany, etc); however, if an efficient transportation system from East Asian countries (for example, a block train formation between Dostyk and Aktau which enables to make shorter transit times and stable, accurate transportation schedules) is established, it will become possible to seek supply sources of construction materials in these countries.

Appendix 8.1.1(2) Logistics Issues (Corporate)**(1) Logistics Issues (Corporate)****1) Corporate Issues and Support Needs concerning Mainly Rail-based Logistics**

The following sections describe the logistics issues and support needs based around rail transportation that are held by the demand side (corporations, business groups including chambers of commerce and industry, industrial groups, and so forth) in each country as clarified in the interview surveys conducted by JICA and the consultants in the target countries (Kazakhstan, China, Azerbaijan, Iran and so forth).

(Below are indicated the summaries and details of survey findings and lists of persons interviewed).

(Survey Targets: as of 7th December, 2006)

Country	Business Groups and Industrial Groups	Corporations	Total
Kazakhstan	7	23	30
China	1	8	9
Azerbaijan	8(5)	11(6)	19(11)
Iran	(3)	(9)	(12)
Japan	1	3	4
Total	20(8)	54(15)	74(23)

Remark: Tables in parentheses indicate the surveys implemented by local consultant.

2) Corporate Issues and Support Needs concerning Mainly Rail-based Logistics

The following sections describe the logistics issues and support needs based around rail transportation (summary) that are held by the demand side (corporations, business and industrial groups).

(Russia)

(a) Items concerning customs clearance functions

- Stringent inspections are enforced on the border with Russia (Moscow, St. Petersburg, Astrakhan, and so forth). In cases where rail transportation crosses over multiple countries, these inspections make it impossible to gauge the accurate transit lead-time. Accordingly, there are high needs for improvement of inspections. In addition to Kazakhstan, this is one of the biggest issues pointed out in China, Azerbaijan and other surrounding nations.

(Example)

- Inspections of cargo intended for Moscow, St. Petersburg and Astrakhan are very strict. This is one of the biggest reasons why it is impossible to calculate the transit lead-time of cargo transported from Europe via Russia. For this reason, many oil and gas plant construction materials, for which it is necessary to accurately know arrival times, are transported by truck rather than rail.

(China)

(a) Items concerning transportation infrastructure

- There are shortages of container platforms at Lianyungang in China. Moreover, many respondents pointed to the poor level of rail infrastructure in China (single line sections still exist, and so on) and the need to improve this.

(b) Items concerning imbalance between import and export modes

- Since exports from China to Kazakhstan and Uzbekistan are greater than exports from Kazakhstan and Uzbekistan to China, it is necessary to return empty containers, thereby adding to exports costs from China.

(Many of the issues pointed out in the survey in China are the same as those given under Kazakhstan (inadequate cargo handling capacity at Dostyk, unstable transportation schedules, transit lead-times, and so forth.). Accordingly, only those items specific to China are described here. Moreover, in order to increase transit goods passing through Kazakhstan, many corporations pointed to the need to build an efficient rail transportation system (block train system, and so forth.) enabling shortened and stable transit lead-time between Dostyk and Aktau).

Issues and support needs are stated in light of demand side (enterprises). However, trade promotion agency in Lianyungang, China points out in the followings.

- Information provision to China on current conditions of railway system in Kazakhstan, including trading conditions is not enough. In particular, information on how railway system in Kazakhstan will be developed in future is not much provided to China. Exchange of various information leading to increase of transportation through China Land Bridge, will be essentially required. Sharing information between China and Kazakhstan is also a key to promoting transportation by rail.

(Azerbaijan)

(a) Items concerning transportation infrastructure in Azerbaijan and Kazakhstan

- Cargo that is transported by rail from Kazakhstan or China to Aktau on the way to Azerbaijan needs to be transported by sea to Baku; however, docking priority at Baku is given to oil tankers. Moreover, the berths here are frequently congested. Construction of a smooth sea transportation system for general cargo between Aktau and Baku (including port facilities at Baku) is currently inadequate, and there are high needs for improvement in this area.

(b) Items concerning marketing information provision functions

- Corporations in Baku do not possess basic information concerning transit times on the route between China – Kazakhstan - Azerbaijan (Baku), what kind of requirements (necessary documents, and so forth.) exist when passing through Kazakhstan, and what kind of issues exist (infrastructure, and so forth.). This means that corporations do not possess sufficient information to compile estimates between China and Azerbaijan and thus miss out on business chances. The shortage of information concerning rail transportation and customs systems in Kazakhstan is a problem, and there are high needs for support regarding the provision of such information.

(Many of the issues pointed out in the survey in Azerbaijan are the same as those given under Kazakhstan (high transportation tariffs in Kazakhstan.). Accordingly, only those items specific to Azerbaijan are described here. Moreover, in order to increase transit goods passing through

Kazakhstan, many corporations pointed to the need to build a rail transportation system (block train system, and so forth.) enabling shortened and stable transit lead-time between Dostyk and Aktau).

- (c) Items concerning tariff policies
 - There is weak in competitiveness in tariffs. There is a high need to arrange more competitive ocean and railway tariffs must be set up.

(Iran)

- (a) Items concerning customs clearance functions
 - The customs system of Iran is both stringent and complicated, and it takes much time for goods to pass through. This was one of the issues most frequently pointed out by the interviewed industrial groups and corporations, indicating a strong need for improvement regarding the shortening of customs clearance time.
- (b) Items concerning transportation infrastructure in Iran and Kazakhstan
 - Shortage of bogies for wagons is very serious in Iran.
 - Cargo that is transported by rail from Kazakhstan or China to Aktau on the way to Iran needs to be transported by sea to Iranian ports. Improvement of a handling capacity at Aktau must be implemented.
- (c) Items concerning a container use
 - Sea containers are occasionally lost in CIS countries. For this reason they are transported only by truck. For the same reason, many companies prefer to strip containers at Bandar Abbas and reload the goods to conventional trucks. This is one of the reasons that transportation by container is not prevailed in Iran

(Japan)

- (a) Items concerning containers
 - The shortage of containers for exporting from Japan to Kazakhstan or Uzbekistan, and so forth. is a major issue. (The lack of containers is one of the causes of high freights).
- (b) Items concerning imbalance between import and export modes
 - Since exports from Japan to Kazakhstan and Uzbekistan are greater than exports from Kazakhstan and Uzbekistan to Japan, it is necessary to return empty containers, thereby adding to exports costs from Japan.
- (c) Items concerning the demand side (corporations)
 - There is a lack of understanding about customs clearance among corporations (shippers and consignees).

(South Korea)

- (a) Items concerning containers
 - The shortage of containers for exporting from South Korea to Kazakhstan or Uzbekistan, and so forth. is a major issue. (The lack of containers is one of the causes of high freights).
- (b) Items concerning imbalance between import and export modes
 - Since exports from South Korea to Kazakhstan and Uzbekistan are greater than exports from Kazakhstan and Uzbekistan to South Korea, it is necessary to return empty containers, thereby adding to exports costs from South Korea.
- (c) Items concerning the demand side (corporations)
 - There is a lack of understanding about customs clearance among corporations (shippers and consignees).

2) Corporate Issues and Support Needs concerning Logistics Based on Rail: Details

Detailed description of the issues and support needs held by the demand side (corporations, business group) concerning logistics based on rail transportation is given in the following sections.

In the table below, “XX companies” indicates the total number of corporations and business group that gave the same response in the interviews. For example, “Too many days are taken in customs clearance (13 companies)” indicates that 13 of companies and groups gave this response. The interviewed corporations are listed in the appendix.

Issues and Support Needs (Items concerning Kazakhstan)

Issues	Support Needs
(a) Items concerning customs clearance functions	
(Items concerning customs clearance functions) 1. The large amount of required documents and rules mean that customs clearance takes too much time (around 3-7~10) days. (13 companies) 2. The customs system is not a one-stop-window system for customers. (Numerous documents must be individually submitted to numerous departments). (1 company) 3. Customs legislation is not working (even though electric declarations are recognized under the law for imports, written declarations are still being demanded. The law is being disregarded). (1 company) 4. Because documentation, and so forth. concerning imports, exports and customs clearance differs between each country, this is a major hindrance to smooth processing. (1 company) 5. All documents in Kazakhstan, whether they are for imports and exports or transit goods, must be translated into Russian. (1 company) 6. Customs information is not electronically processed and paper is still relied on to a large extent. (1 company) 7. Since tariff transfers via banks must as a rule be conducted with respect to the customs house in Astana, an extra day is required for customs clearance at Almaty in order to confirm payment. (1 company) 8. Informal cost (US\$50~200/BL) must sometimes be required in order to expedite customs clearance. (4 companies) 9. When exporting cereals from port, customs clearance cannot be conducted until the quantity is determined (until loading is finished), so ships need to be dock for 1, 2 or 3 days before departing. (1 company)	- Institutional (legislation) and operational improvements need to be made to the customs clearance system. In particular, considering the issues pointed out, steps to shorten customs clearance time must be given top priority.
(b) Items concerning inspection functions on the border (Dostyk)	
(Items concerning inadequate functions on the border: items concerning inspections, and so forth.) 1. Sampling inspections on the border (Dostyk, and so forth.) are causing transportation delays in imports, exports and transit goods. (3 companies) 2. Some items of cargo are getting lost. (1 company)	- It is necessary to review the contents and setup of inspections.
(c) Items concerning transportation infrastructure in Kazakhstan	
(Items concerning the lack of rail network and rail-related facilities) 1. There are not enough facilities for aiding logistics work such as platforms, reloading facilities, and so forth. on the border (Dostyk, and so forth.). In particular, the shortage of reloading facilities is critical at Dostyk. (9 companies)	- Considering the issues pointed out, it is necessary to increase the number of platforms and boost reloading capacity (cranes, indoor facilities, and so forth.).

Issues	Support Needs
2. Equipment at Dostyk is insufficient. Equipment and functions should be transferred to Aktogay. (1 company) 3. The plan to construct a railway linking the east and west of Kazakhstan is not being implemented. (However, even if the railway were constructed, it would make little sense if the cost were directly transferred to rail tariffs). (2 companies) 4. Railway-related facilities (rails, stations, border inspection facilities, and so forth.) in Kazakhstan overall are inadequate. In particular, a punctual rail transportation system (infrastructure) is not in place (there is no accurate schedule for rail transportation across Kazakhstan and the number of days in transit is not determined). Rail routes corresponding to market needs are not in place, and there is a shortage of railway development to support trade with China, which has high growth potential. (6 companies) In particular, many corporations in Mangystau import building materials, oil and gas plant materials from Europe. However, corporations in China can provide these materials at cheaper prices. If a more efficient transportation system directly linking the CLB and Kazakhstan (Dostyk-Almaty-Aktau) were established (lower cost transportation + shorter transit time, precise schedule e.g. block train transportation between Dostyk-Almaty-Aktau), there is a possibility that cargo imports from China and transit cargo through Kazakhstan will expand further; however, policies and measures towards this goal are inadequate. (3 companies) 5. Some cargo intended for domestic transportation must pass through Russian territory (in the north), making it necessary to implement inspections and so on. The rail network is still insufficient to overcome such problems. (1 company) 6. There are not enough logistics centers at the international level. (1 company) 7. There is no system for tracing cargo. (1 company)	Moreover, it is necessary to examine transferring equipment and functions from Dostyk to Aktogay. - It is important to develop a rail system (more platforms, new routes, and so forth.) that is suited to market needs. - In particular, it is necessary to build Kazakhstan railways that take more accurate schedules and definite transit times into account. - It is necessary to build a more efficient rail transportation system (low costs + faster transit times) linking China to Mangystau Province.
(Items concerning the shortage of container platforms) 1. There is a shortage of container platforms in Kazakhstan. (6 companies) 2. Cargo platforms are built for 40 feet containers, but there are no cargo platforms for use with 20 feet containers. (1 company)	- In particular, it is necessary to increase the number of container platforms.
(d) Items concerning rail tariff policies	
(Items concerning tariffs) 1. High rail transportation costs (tariffs) are hindering the expansion of transit volumes. (7 companies) 2. Tariffs are subject to sudden changes. Through making it necessary to give explanations to customers and prepare new documents and so forth, this creates great confusion for customers and forwarders. (8 companies) 3. Rail transportation tariffs are high between Aktau Port Station and Mangystau Station. (1 company)	- It is necessary to provide stable tariffs and, when revising tariffs, to provide abundant information with appropriate timing.
(e) Ports: port items relating to rail transportation	
(Items concerning Aktau Port) 1. Port development of Aktau Port has witnessed a certain degree of improvement, however, it remains inadequate. In particular, port development suited to markets (Iran, and so forth.) is insufficient. (2 companies) 2. Kascor Trans Service monopolizes transportation on the line that links Aktau Port Station and Mangystau Station. Currently, large quantities of natural resources such as oil and natural gas, and so forth. are transported on this section, however, container cargo transportation times fluctuate between 6~8 hours and one and a half days. Moreover, there is a shortage of lift equipment for moving 40 feet containers, and so forth. The situation whereby Kascor Trans Service owns this short section of line and a different company – KTZ – owns other sections leads to a lot of inefficiency. (2 companies)	- Further development is required. In particular, port development that considers the Aktau-Iran route in addition to the conventional Russia-Aktau route is needed. - It is necessary to improve the transportation route of the line between Aktau Port Station and Mangystau Station (measures for shortening time at Mangystau Station: higher reloading capacity, better cargo storage areas).

Issues	Support Needs
(f) Roads: items concerning port roads connected to rail transportation	
1. There is inadequate road development in Mangystau Province. (1 company) 2. Overall, there is a shortage of road development for truck transportation. (1 company)	- It is necessary to promote road development for storing rail transportation.
(g) Items concerning the demand side (corporations)	
(Items concerning the trade know-how of exporters and importers) 1. Corporations (shippers/consignees, particularly in China, South Korea and Japan, and so forth.) lack knowledge concerning customs clearance matters. (3 companies)	- It is necessary to educate domestic and overseas corporations about the customs clearance system in Kazakhstan.
(h) Items concerning other matters	
1. Lease rates for containers borrowed by importers and exporters are high. (1 company) 2. Prices of actual containers are high. (2 companies) 3. Import tariffs are high. (1 company) 4. The business operating structure of KTZ/KTS is old. (1 company) 5. There is a lack of human resources development for transportation work. (1 company)	- It is necessary to review tariffs. - It is necessary to promote business management reform.

Issues and Support Needs (Items concerning Russia)

Issues	Support Needs
(a) Items concerning customs clearance functions	
(Items concerning rail infrastructure) 1. Inspections on transit cargo passing through St. Petersburg and Moscow in Russia are extremely stringent. Since similar inspections to Kazakhstan are implemented, this major factor makes it impossible to calculate the number of days for rail transit from Europe. (2 companies) 2. A lot of time is taken for inspections and customs clearance procedures by border police at Astrakhan (on the coast of the Caspian Sea in Russia) close to Atyrau in the northwest. Inspections of transit cargo at Astrakhan are just as stringent as in Kazakhstan and lead to major holdups of cargo. This is a critical problem. (2 companies)	- It is necessary to improve inspections on transit goods passing through countries.

Issues and Support Needs (Items concerning China)

Issues	Support Needs
(a) Items concerning customs clearance functions	
1. There are too many rules and documents to submit. (1 company)	- It is necessary to simplify the customs clearance system.
(b) Items concerning transportation infrastructure in China	
(Items concerning railway infrastructure) 1. There is a shortage of container platforms at Lianyungang in China. Occasionally, it takes 3-4~7days until platforms are provided. (4 companies) 2. Reloading at Lianyungang takes too much time. (1 company) 3. Platforms are built for 40 feet containers, but there are no platforms for use with 20 feet containers. (1 company) 4. There is a lack of railway development in China (some sections are still not double tracked, in particular between Alashankou and Dostyk). (4 companies) 5. Facilities at Alashankou on the CLB are inadequate. (1 company)	- It is necessary to develop railway infrastructure according to market needs, and it is necessary to make improvements with respect to other countries.

Issues	Support Needs
(c) Items concerning transportation infrastructure in Kazakhstan - There are still inadequate logistics facilities for cargo reloading, and so forth. at Dostyk, and so forth. Restrictions have been placed on rail transportation from Urumqi to Kazakhstan (the number of days devoted to cargo reloading for rail transportation to Kazakhstan has been limited to around eight days per month at Urumqi). (6 companies) - Exact schedules and transit times for rail transportation passing through Kazakhstan are not definite. Without defining these items, it will be extremely difficult to find new customers for transit cargo through Kazakhstan (in particular, customers wishing to transport to Europe). If a block train system (with shorter transit time) can be built between China - Dostyk - Aktau, it will be possible to guarantee transit lead-time more accurately. It is possible that this will promote exports from China to Western Kazakhstan, Iran, Azerbaijan, Eastern Europe and Western Europe. However, the policies and measures for achieving this are not implemented. (8 companies) - The plan to build a railway linking the east and west of Kazakhstan is not being implemented. (1 company)	- It is necessary to expand facilities at Dostyk. - It is necessary to construct a block train transportation system between China – Dostyk - Aktau (in combination with strengthening functions).
(d) Items concerning inspection functions on the border with Kazakhstan (Dostyk) - It is necessary to arrange informal payment in order to expedite cargo reloading at Dostyk. 2 companies) - Parts of cargo go missing. (1 company)	- It is necessary to improve the inspection system on the border.
(e) Items on the demand side (corporations) (Items concerning the trade know-how of exporters and importers) Corporations (shippers/consignees) lack knowledge concerning customs clearance matters. (2 companies)	- It is necessary to educate overseas corporations about the customs clearance system in Kazakhstan.
(f) Items concerning the imbalance between exports and imports (Items concerning the export/import imbalance in container cargo) Since exports from China to Kazakhstan are greater than exports from Kazakhstan to China, it is necessary to return empty containers, thereby adding to exports costs from China. This also contributes to the shortage of export containers. (5 companies)	- It is necessary to implement policies (tariff policies, railway development) aimed at balancing exports and imports.
(g) Other points - Even if companies want to develop transportation routes to Azerbaijan, Iran, Eastern Europe and Western Europe, the stringent border inspections in each country mean that exact transit times cannot be gauged. This has a major impact on local market development. (1 company) - Rail transportation can only carry goods to destination stations; however, truck transportation can deliver to customer facilities. (1 company) - Information provision to China on current conditions of railway system in Kazakhstan, including trading conditions is not enough. In particular, information on how railway system in Kazakhstan will be developed in future is not much provided to China. Exchange of various information leading to increase of transportation through China Land Bridge, will be essentially required. (1 company)	- It is necessary to build transportation systems that enable accurate transit times to be grasped. - It is necessary to establish a marketing function, including information provision in order to induce more cargo.

Issues and Support Needs (Items concerning Azerbaijan)

Issues	Support Needs
(a) Items concerning customs clearance functions - Inspections of transit cargo passing through Moscow in Russia are extremely stringent. Since similar inspections to Kazakhstan are implemented, this is a major factor in making it impossible to calculate the number of days for rail transit from Europe. (1 company) - Customs clearance functions in Azerbaijan are open Saturdays and Sundays, 09:00-18:00, every day of the year. The customs fees price for the weekends is double (1 company)	- It is needed to simplify transit customs procedures in Iranian Borders - It is advisable to introduce the customs broker profession

Issues	Support Needs
3. Customs in Iran require too much paperwork, but when available, then clearance time is low (1 company). 4. The set of documents needed for customs clearance takes a lot of time for transport forwarders (2 companies) 5. Electronic declarations are not used and it will take time until they start to be used (1 company)	
(b) Items concerning customs clearance in transit routes out of Azerbaijan	
1. Some items of cargo are getting lost. (1 company) 2. It takes a lot of time for Dostyk border crossing (1 company) 3. Russian customs require a lot of paperwork (almost double than in Azerbaijan) (1 company) 4. Kazakhstan customs documents, almost as many as in Azerbaijan (1 company) 5. Inspections of transit cargo passing from Iran to Russia are extremely stringent and time consuming in Astana Border station (2 companies)	- It is necessary to review the contents and setup of inspections. - Customs should collaborate with customs authorities of most commonly used transit countries
(c) Items concerning the transportation infrastructure in Azerbaijan and Kazakhstan	
Items concerning railway infrastructure and marine transportation infrastructure) 1. Cargo that is transported by rail from Kazakhstan or China, and so forth, to Azerbaijan via Aktau needs to be carried over sea to Baku. However, docking priority at Baku is given to oil tankers. Moreover, the berths here are frequently congested. Construction of a smooth marine transportation system for general cargo between Aktau and Baku (including port facilities at Baku) is currently inadequate. (4 companies) 2. There is no route directly linking east and west Kazakhstan. Such a route would shorten transit cargo transportation times through the country. (2 companies) 3. Exact schedules and transit times for rail transportation passing through Kazakhstan are not defined. If a block train (with shorter transit time) can be built, it will be possible to expand cargo transportation between Baku and these areas. It is possible that this will lead to expansion of exports to China from Baku, and reduce the cost of returning empty containers back to China. However, policies and measures for this purpose are not yet being implemented. (4 companies) 4. The Kazakhstan route to China is not preferable for Azeri companies due to time, cost and safety indicators. It takes a lot of time, the cost is double and the cargo is not safe. (5 companies). 5. The road routes in Kazakhstan are inefficient, so it takes a lot of time for transport (e.g. 1-2 days for 100 km) (3 companies) 6. Ferry connection Baku – Aktau is unreliable during winter time (1 company) 7. There is no railway connection with Iran (6 companies) 8. Baku port access roads are congested, so the trucks lose time to reach the port. Night shifts are preferred (6 companies) 9. TRACECA corridor will only function when loading-unloading operations get faster (1 company) 10. The planned relocation of the port is crucial and urgent (6 companies).	- Railway infrastructure development in line with market needs is required, and measures need to be implemented for that purpose. - It is necessary to implement measures to ensure smooth marine transportation (shorter transit times). - It is necessary to construct a block train transportation system between China – Dostyk - Aktau (in combination with strengthening functions). - Faster and bigger ferry between Baku - Aktau - The new North – South Corridor will include a new railway connection with Iran - New port in Baku will be constructed - Cargo terminal should be constructed in Alyat
(d) Items concerning rail tariff policies	
(General tariff policy) 1. In order to attract transit cargo, competitive tariffs are not set on transit routes. (4 companies) 2. The shipping lines tariffs are monopolized (2 company)	- It is necessary for generally competitive tariffs to be set based on consensus of the countries concerned. - Transport market should be further liberalized
(e) Items concerning marketing information provision functions	
(Marketing information provision functions) 1. Corporations in Baku do not possess basic information concerning transit times on the route between China – Kazakhstan - Azerbaijan	- It is necessary to build a system for explaining the status of customs and

Issues	Support Needs
(Baku), what kind of requirements (necessary documents, and so forth.) exist when passing through Kazakhstan, and what kind of issues exist (infrastructure, and so forth.). Moreover, they do not know where they can acquire such information. (there are around 5 or 6 requests per month for estimates of inland transportation between China – Kazakhstan – Azerbaijan ranging from a few TEU to 150 TEU, however, there is insufficient information to make estimates and business chances are lost as a result). (1 company) 2. Transport forwarders in Baku are not interested for TRACECA route as they prefer to serve the market through Bandar Abbas port in Iran and alternatively via Poti in Georgia. (5 companies)	facilities in Kazakhstan regarding transit goods from China and Azerbaijan (e.g. assignment of permanent consultants in key areas (Baku, Urumqi, and so forth.) to immediately respond to customers' inquiries). - It is necessary to promote TRACECA route by upgrading the transport infrastructure for it
(f) Other points	
1. Many cargoes are transported not by rail but by sea between Azerbaijan and China. Efficient transportation system by rail passing through Kazakhstan is not established. (1 company) 2. Capacity buildings for staff in railway companies are not enough. (1 company) 3. The business operating structure is old. (1 company) 4. Ferries to Kazakhstan are small and slow (1 company) 5. It is difficult to find a good and reliable partner (freight forwarder) in Kazakhstan (1 company)	- It is necessary to establish competitive transportation mode by rail. - Capacity buildings are also required in addition to development facilities.

Issues and Support Needs (Items concerning Iran)

Issues	Support Needs
(a) Items concerning customs clearance at borders and ports	
1. Customs control in entry to Iran is very strict. Good relationships are necessary. (3 companies) 2. Difficult controls and need for informal payments. (2 companies)	- As to customs charge, it is necessary for Iranian government to adopt Kyoto Convention and follow the relevant procedures better and with higher transparency. The customs clearance rules should be uniform and should not be modified without advanced information. - Train custom officers to better, more transparent and less bureaucratic procedures. - Provide incentives for ethical performance
(b) Items concerning phytosanitary inspections at borders	
1. Phytosanitary controls are complicated and very tough in all border crossings, especially if the goods are not accompanied with necessary certificates and documents. (4 companies)	- Simplification for procedures is required.
(c) Items concerning transport infrastructure in Kazakhstan	
1. Anchorage at Aktau port is difficult. Ships may have to wait 1 week. The anchorage is also difficult in bad weather conditions. Aktau port has 3 berths, two are dedicated to scrap iron and one to finished iron. It should be the other way around. (1 company)	- Investigate a better allocation of berth capacity in Aktau port. Increase the capacity of Aktau port to reduce waiting at anchorage
(d) Items related to railway, railway transport and railway tariffs	
1. The number of wagons that can change boogie so that they can move on CIS railway network is not sufficient for railway transport to/from CIS. Only in cotton export season (summer and part of fall) from CIS a large number of them comes to Bandar Abbas. But in that season, all wagons	- Create a fleet of wagons with removable boogies in Iran railways or by private railway operators in Iran.

of this type are available only in Bandar Abbas and not in other parts of Iran, to serve exports. (5 companies) 2. Long waiting for boogies change in Sarakhs. Transit time is not respected by railways. Transport duration gets longer due to change of locomotive too. Railways are bureaucratic. (3 companies)	
(e) Items related to containers	
1. Sea containers are lost in CIS countries. For this reason they are transported only by truck, with return paid (what makes transport more expensive, because they usually return empty), or they use Shipper Owned Containers (SOC) as one way containers. For the same reason, many companies prefer to strip containers at Bandar Abbas and reload the goods to conventional trucks. (2 companies) 2. No control over wagons and their contents in CIS countries (2 companies)	- Increase the surveillance of trains to CIS countries. - Make sure block trains are used.
(f) Items related to shipping in the Caspian Sea	
1. Ro-Ro operations in the Caspian Sea between Iranian and Russian ports are erratic. The operations should be regular, but this is not respected by Russian side. The long delays that are being experienced restrict the export of fresh Iranian products to the markets. When products arrive, they are not in good condition. (2 companies)	- The number of Ro-Ro ships is too small. At least one new Ro-Ro vessel will be introduced to operation by Khazar Shipping Company. - Ro-Ro ships should operate according to schedule and there should be an agreement to penalize non complying ships - Create a refrigerated storage in Bandar Anzali.

Issues and Support Needs (Items concerning Japan)

Issues	Support Needs
(a) Items concerning inspection functions on the border (Dostyk)	
1. Some items of cargo are getting lost. (1 company)	- It is necessary to review the contents and setup of inspections.
(b) Items concerning the transportation infrastructure in China and Kazakhstan	
1. There is a shortage of container platforms at Lianyungang in China. (1 companies)	- It is necessary to establish a comprehensive transportation system to ensure smooth transportation.
2. There are not enough facilities for aiding logistics work such as platforms, reloading facilities, and so forth. at Dostyk (2 companies) 3. Railway-related facilities (rails, stations, electrification, and so forth.) in Kazakhstan overall are inadequate. (1 companies) 4. If a more efficient transportation system directly linking the CLB and Kazakhstan (Dostyk-Almaty-Aktau) were established (lower cost transportation + shorter transit time, e.g. block train transportation between Dostyk-Almaty-Aktau), there is a possibility that cargo imports from Japan to western area of Kazakhstan will expand further; however, policies and measures towards this goal are inadequate. (1 companies)	
(c) Items concerning containers	
(Shortage of containers) 1. There are shortages of containers for exporting from Japan to Kazakhstan or Uzbekistan, and so forth. (This is a major factor contributing to high tariffs). (3 company)	- It is necessary to implement policies to promote trade from Kazakhstan/Uzbekistan to Japan.
(d) Items concerning the imbalance between exports and imports	
1. Since exports from Japan to Kazakhstan and Uzbekistan are greater than exports from Kazakhstan and Uzbekistan to Japan, it is necessary to return empty containers, thereby adding to exports costs from Japan. (2 company)	- It is necessary to implement policies (tariff policies, railway development) aimed at balancing exports and imports.

(e) Items concerning rail tariff policies 1. Tariffs are subject to sudden changes. Through making it necessary to give explanations to customers and prepare new documents and so forth, this creates great confusion for customers and forwarders. (1 company)	- It is necessary to provide stable tariffs and, when revising tariffs, to provide abundant information with appropriate timing.
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Issues and Support Needs (Items concerning South Korea)

Issues	Support Needs
(a) Items concerning containers (Shortage of containers) 1. There are shortages of containers for exporting from South Korea to Kazakhstan or Uzbekistan, and so forth. (This is a major factor contributing to high tariffs). (1 company)	- It is necessary to implement policies to promote trade from Kazakhstan/Uzbekistan to South Korea.
(b) Items concerning the imbalance between exports and imports 1. Since exports from South Korea to Kazakhstan and Uzbekistan are greater than exports from Kazakhstan and Uzbekistan to South Korea, it is necessary to return empty containers, thereby adding to exports costs from South Korea. (1 company)	- It is necessary to implement policies (tariff policies, railway development) aimed at balancing exports and imports.

(List of management and industrial groups and corporations interviewed in Kazakhstan)

Classification	No.	Survey Site	Work Category	Business Category
Management and industry groups	1	Almaty	Chamber of commerce and industry	- Almaty Chamber of Commerce and Industry (40 member companies)
	2		Group of forwarders	- Forwarding (approximately 70 member companies)
	3		Customs group	- Customs group (46 member companies)
	4		Auto sales group	- Automobile importing and retailing (18 member companies)
	5	Aktau	Chamber of commerce and industry	- Aktau Chamber of Commerce and Industry (40 member companies)
	6	Atyrau	Chamber of commerce and industry	- Atyrau Chamber of Commerce and Industry (15 member companies)
	7	Astana	Chamber of commerce and industry	- Astana Chamber of Commerce and Industry (120 member companies)
Corporations	1	Almaty	Local forwarder	- Forwarding work centered on exports of mining corporations
	2		Local forwarder	- Forwarding work centered on various products
	3		Local forwarder	- Forwarding work to private corporations (main customers are corporations exporting oil, gas, coal and other raw materials)
	4		Local forwarder	- Forwarding work centered on used car imports from South Korea and imports from China (construction machinery, raw materials, furniture, and so forth.)
	5		Local forwarder	- Forwarding work centered on imports (in particular, special cargo: specialized plant cargo) from China and South Korea
	6		South Korea-based forwarder	- Forwarding work centered on cargo from South Korean to Uzbekistan
	7		Japan-based forwarder	- Forwarding work centered on import of used cars from Japan
	8		Local company	- Oil extraction company
	9		Local company	- Cotton production company
	10		Local company	- Beverage production company
	11		Local company	- Trucking company
	12	Aktau	Local forwarder	- Forwarding work centered on exports of mining companies
	13		Europe-based forwarder	- Forwarding work centered on exports of mining companies
	14		Europe-based forwarder	- Forwarding work centered on transportation of oil and gas plant (JV between a European forwarder and local forwarder)
	15		Local construction company	- Leading construction company in Mangystau
	16		Local marine transportation agent	- Marine transportation agency (combining work as a forwarder in the Caspian Sea)
	17	Atyrau	Europe-based forwarder	- Forwarding work centered on exports of mining companies
	18		Oil corporation	- Corporation that extracts and transports oil
	19		Marine transportation company	- Marine transportation company
	20	Astana	Europe-based forwarder	- General forwarding work (in particular, light air cargo)
	21		Russia-based forwarder	- Forwarding work centered on manufacturing corporations
	22		Local corporation	- Gas extraction company
	23		Local corporation	- Food manufacture and processing company

(List of industrial groups and corporations interviewed in China)

Classification	No.	Survey Site	Work Category	Business Category
Management and industry groups	1	Urumqi	Chamber of commerce and industry	International Trade promotion Committee in Xinjiang
Corporations	1	Urumqi	Local forwarder	- Forwarding work centered on general cargo
	2		Local forwarder	- Forwarding work centered on general cargo
	3		Local logistic cooperation	- One of the biggest logistic corporation in Xinjiang
	4		Local Trading corporation	- One of the biggest trading corporation in Xinjiang
	5	Lianyungang	South Korea-based forwarder	- Forwarding work centered on cargo from South Korean to Uzbekistan
	6		Local forwarder	- Forwarding work centered on China land Bridge cargo
	7		Local forwarder	- Forwarding work centered on China land Bridge cargo
	8		Local forwarder	- Forwarding work centered on used cars from Japan

(List of industrial groups and corporations interviewed in Azerbaijan)

Classification	No.	Survey Site	Work Category	Business Category
Management and industry groups	1	Baku	Chamber of commerce and industry	- Baku Chamber of Commerce and Industry (40 member companies)
	2		Trade promotion group	- Government trade promotion agency
	3		Rail group	- TRACECA(Azerbaijan)
	4		Ministry of Transport	- Public Institution
	5		Baku Port	- Port Authority
	6		State Maritime Administration	- Public Institution
	7		State Customs Committee	State Customs Committee
	8		Rail Company	Sate rail Company
Corporations	1	Baku	Europe-based forwarder	- Forwarding work centered on exports of mining companies
	2		Europe-based forwarder	- Forwarding work centered on materials/cargo related to oil production
	3		Local forwarder	- Forwarding work centered on materials/cargo related to oil production
	4		Local forwarder	- Forwarding work centered on materials/cargo related to oil production
	5		Local forwarder	- Forwarding work centered on materials/cargo related to oil production
	6		Local forwarder	- Europe-based forwarder
	7		Local forwarder	- Local freight forwarder
	8		Local forwarder	- Local freight forwarder
	9		Local forwarder	- Local freight forwarder
	10		Transport company	- International Road Transport Company
	11		Shipping Company	- Shipping Company

(List of industrial groups and corporations interviewed in Iran)

Classification	No.	Survey Site	Work Category	Business Category
Management and industry groups	1	Tehran	Transport Companies Associations	ITCA: Iranian Transport Companies Associations Carriers and freight forwarders involved ONLY in international transport
	2		Chamber of Commerce, Industry & Mines	ICCI & M: Iran Chamber of Commerce Industry and Mines. Acting as contact between entrepreneurs and establish their links to government, parliament, president, and judiciary system. Organizing exhibitions, seminars, and international meetings of CC.
	3		Exporters Association	EXAMIE: Iran Exporters Association. Transportation of imports/exports and transit goods
Corporations	1	Tehran	Transport company	A forwarding company that does not own trucks
	2		Transport Company	A forwarding company that does not own trucks
	3		Transport Company	Transport company that does not own trucks
	4	Bandar Anzali Port	Shipping Company	A shipping company
	5	Tehran	Shipping company	A shipping company specialized in dry bulk, vegetable oil and container transportation
	6	Tehran/Bandar AmirAbadPort	Stevedoring Company	Operation Services for Container, general cargo, bulk cargo terminal, liquid
	7	Tehran and in Nowshahr port	Stevedoring Company	Operation Services for serving domestic, transit and transshipment cargoes
	8	Tehran	Private railway company	Railway company which transports by rail almost exclusively chemical products and fuel.
	9		Exporter	Manufacturers of detergents, dish washing liquids, bleach, various beauty and hygienic Soaps, fabric softener, scouring powders, and toothpastes and many other products

(List of industrial groups and corporations interviewed in Japan)

Classification	No.	Survey Site	Work Category	Business Category
Management and industry groups	1	Tokyo	Trade promotion group	- Government trade promotion agency
Corporations	1	Tokyo	Japan-based forwarder	- Forwarding work centered on import of used cars from Japan
	2		Trading corporation	- One of the biggest trading corporation in Japan
	3		Trading corporation	- Trading corporation centered on used cars of exports to Kazakhstan

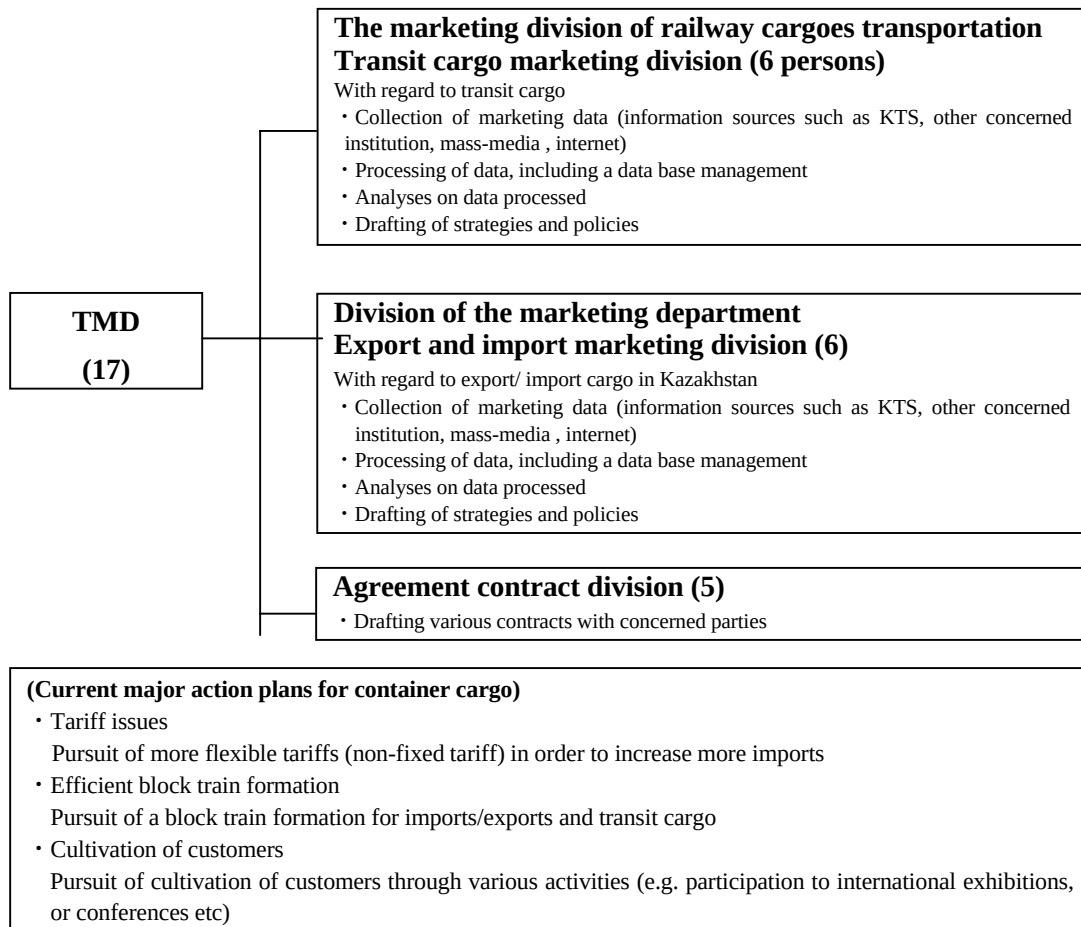
Appendix 8.1.2(1) Outline of marketing functions for mainly container cargoes at KTS and KTZ

(KTZ)

(1) Transportation Marketing Department (TMD)

- Transportation Marketing Department (TMD) at KTZ has a responsibility for marketing. It implements marketing, not only for container cargoes but also other bulk cargoes such as mineral resources or grains. KTZ has several oversea branches in Urumqi, Beijing in China and Baku in Azerbaijan, but these do not completely focus on marketing for container cargoes.
- With regard to marketing for container cargoes, TMD does not directly specialize in marketing for a cultivation of customers with container cargoes and mainly focus on collecting information from various sectors (bulk and non-bulk), analyzing it and making strategies and policies. Therefore, 50-60% of workforce is for a data-base management and analyses on information to prepare strategies.

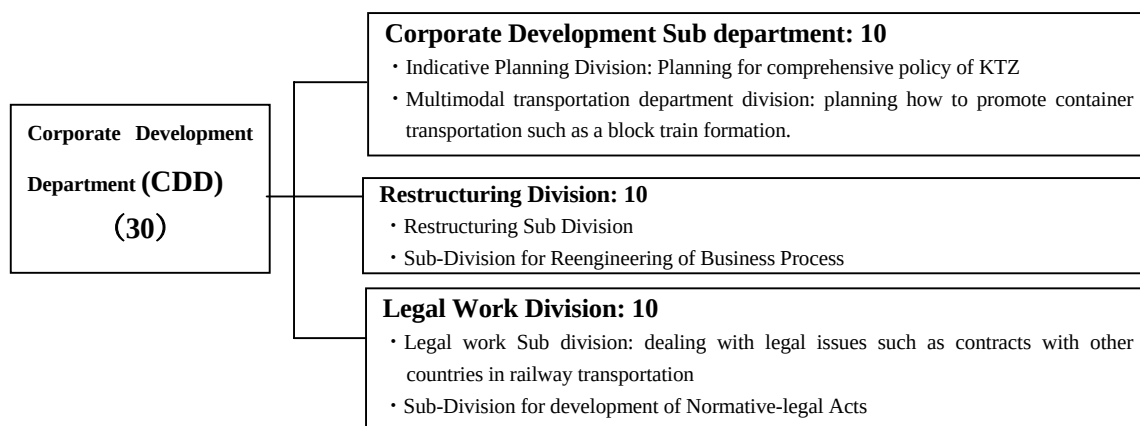
TMD (Transportation Marketing Department) structure



(2) Corporate Development Department (CDD)

- The division, related to marketing in container cargoes is Multimodal Transportation Development Division (MTDD) of Corporate Development Sub Department, which has responsibilities in planning for multimodal container transportation.
- Multimodal Transportation Development Division does not mainly cultivate customers directly but make a plan of how to promote container transportation through a block train formation. Main supply source of information as to current conditions of container transportation is KTS

Corporate Development Department (CDD) structure

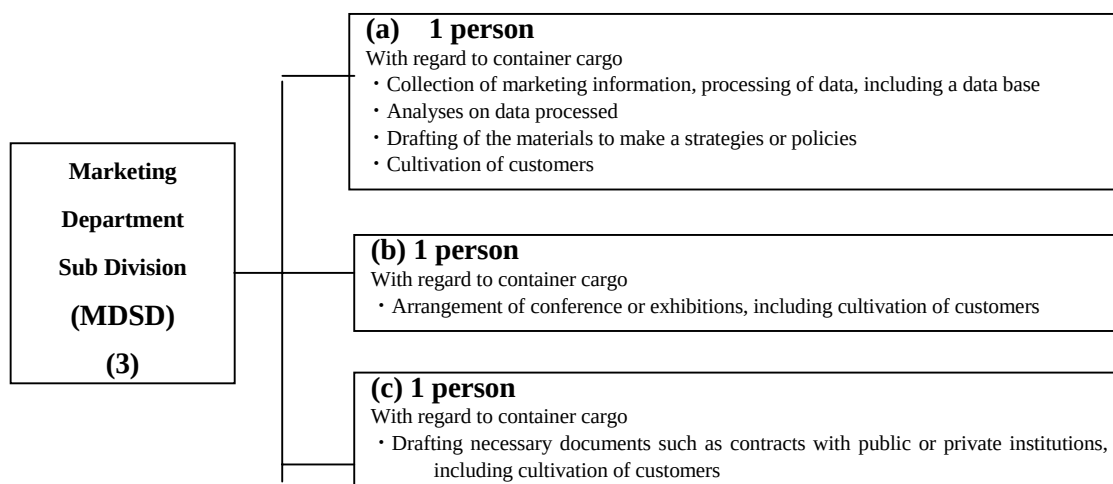


(KTS)

(1) Marketing Department (MD)

- Marketing Department (MD) at KTS is composed of 12 persons (Marketing: 3persons, Revenue/payment management: 2 persons and forwarding: 7 persons). Marketing Department Sub Division (MDSD), composing of 3 staffs, focuses on marketing only for container cargoes.
- For example, MDSD implements various activities to cultivate customers through organizing conferences, attending exhibitions and regular meetings with business groups such as forwarding companies, or a trial arrangement of a block train from Urumqi to Ukraine and so forth. In particular, MDSD has one oversea branch in Urumqi, China, in order to cultivate customers from Urumqi to Kazakhstan or Eastern Europe (Ukraine) and so forth.
- There are several responsibilities at MDSD such as information collection, processing and analyses or implementation of customer cultivation. Due to a limited number of staff, some of responsibilities such as cultivation of customers are shared among them.

Marketing Department Sub Division (MDSD) structure



Appendix 8.1.2(2) Details of the Action Plans to Establish More Efficient Marketing System

In order to strengthen marketing functions (information collection/analysis for marketing, implementation and a review of performance to cultivate customers), efficient action plans, based on current conditions, must be formulated. Among actions described in the previous section (Table 8.2-1), as to key issues, how to take actions is described in followings. (How to strengthen marketing functions assuming to KTZ or KTS is described.)

1: Strengthening functions of information collection and analysis for cultivations of customers

In order to strengthen functions of information collection and analysis for marketing, firstly, items of information to be collected for marketing must be clearly defined and secondly, system to collect and analyze necessary information must be efficiently established. Minimum items to be collected for marketing are in the followings. (Sources or approaches to collect information are also described.)

(Items to be collected for more efficient marketing and methods to collect them)

1) Strengthening functions of marketing information collection and analysis

- a) Information collection and analysis on Macro data (current conditions of bilateral trades with Kazakhstan and transit trades passing through Kazakhstan or potentiality of economic growth of partner countries and so forth)

(Sources or approach to collect information)

Data from donors or relevant government institutions, such as World Bank, IMF, ADB or Ministry of Industry and Trade and so forth

- b) Information collection and analysis on micro data (Profiles of current, potential, domestic and foreign customers (corporations, forwarders etc), including current and future cargo prospects, transportation routes, issues and their support needs in railway logistics and so forth)

(Sources or approach to collect information)

For example,

(Domestic approach): In addition to conferences or meetings with business groups such as forwarders or customs brokers, information collection from potential customers with container cargoes is essentially required. For that purpose, an approach to more specific industrial groups (e.g. oil & gas, machinery, construction, motor vehicle, agriculture industries and so forth) with current or potential container cargoes must be implemented, in order to collect more useful information. Moreover, an approach to an individual customer to collect necessary information must be deepened, in order to gain more information that will lead to increase of transportation of container cargoes. Seminars will also be one of sources in which necessary information for marketing can be obtained.

(Oversea approach): Similar to approaches to collect information from domestic customers, an approach to more specific industrial groups (e.g. Chamber of Commerce and Industry or industrial groups such as oil & gas, machinery, construction, motor vehicle, agriculture industries) with potential

container cargoes must be implemented in order to collect more useful information. In particular, an approach to an individual foreign customer to collect information must be deepened, in order to gain more information that will lead to increase of transportation of container cargoes. Seminars will also be one of sources in which necessary information for marketing can be obtained

c) Information collection and analysis on other countries

Information relating to other countries, such as current conditions of railway development of SLB and CLB, trade policies of other countries, must be clarified.

(Sources or approach to collect information)

For example,

Information collection through seminars or meetings with relevant public institutions among concerned countries

A formulation of a working group; e.g. a regional working group such as (East Asia and Kazakhstan, EU and Kazakhstan, Central Asia and Kazakhstan and so forth),

A formulation of a working group of specific routes; e.g. (East Asian countries) – (Kazakhstan) – (Russia, Iran, Azerbaijan, European countries) in order to collect information on current operation of railway or prospects of handling cargo volumes in the route

d) Information collection and analysis on current and future plans of railway operation or development in Kazakhstan

(Sources or approach to collect information)

For example, items to be collected from relevant public institution such as Ministry of Transport and Communication, KTZ and KTS and so forth must be clearly defined. System to collect and analyze information must be properly strengthened.

(Information Collection and Analysis Remarks)

In order to collect and analyze necessary information relating to (a)-(d), more efficient system to do that precisely and properly is required. With regard to some of information collection and analysis, it may be more efficient to request local consultants to do partially. In that case, it is very important to examine responsibilities to request them carefully. For example, information to be collected, such as current conditions of bilateral trades with Kazakhstan and transit trades passing through Kazakhstan or current conditions of competing corridors, can be out-sourced. As to a study in corporate issues and support needs on rail transportation, there is a possibility that interviews by neutral parties (consultants) may be more efficient in that corporations can state real conditions to them. In that case, it may be considered that a survey to collect and analyze on corporate issues and support needs may be implemented totally by consultants or jointly by KTS, KTZ and consultants.

2: Strengthening a function of implementation to cultivate more customers

Based on analysis on collected information, a positive approach to cultivate current, potential or domestic, foreign customers that can transport more container cargoes through railway in Kazakhstan must be taken.

In particular, it is very important to strengthen a function of implementation of marketing, namely, to visit not only domestic but also foreign customers with potential container cargoes, so as to pursue more profits.

a) Strengthening a function of implementation to cultivate more customers

Based on analysis on information, targeted countries or areas, in particular, customers, commodities or corridors for marketing must be firstly defined and secondly, concrete actions must be taken.

In particular, actions to targeting customers with current and potential import cargo of containers to Kazakhstan or current and potential transit cargo of containers, passing through Kazakhstan, in other words, more approaches to cultivate foreign customers with these cargoes must be positively implemented.

Strengthening a function of marketing in foreign countries (e.g. establishment of overseas branches for marketing), may contribute to not only increase of bilateral cargoes with Kazakhstan but also transit cargoes, passing through Kazakhstan. Currently, KTS has a branch in Urumqi, China and KTZ has a branch Urumqi and Beijing in China and Baku, in Azerbaijan. Except Urumqi, cultivation of foreign customers with container cargoes is not sufficient. In order to cultivate more cargoes, establishment of more overseas branches focusing on marketing in countries targeted must be considered. Ideally, establishment of overseas branches and assignment of staffs, focusing on marketing would be desirable, but under the condition that it is difficult to do that, at least, marketing staffs must be properly and timely dispatched to countries targeted, in order to cultivate customer or collect necessary information. For that purpose, effective system to dispatch marketing staff regularly to countries targeted must be established. The countries targeted may firstly be East Asian countries such as Japan, South Korea and China, neighboring countries such as Russia, Iran and Azerbaijan and so forth.

Box 8.1-1 Establishment of Overseas Branches

1) Marketing responsibilities in countries targeted¹⁾, would be as below.

1. Cultivation of customers (an approach to customers)
2. Provision of useful information to current and potential customers
3. Market survey, including cargo prospects, corporate issues and support needs relating to transportation by rail and so forth

¹⁾ Detailed investigations to countries targeted must be done in order to decide assignment of marketing staff.

Ideally, establishment of overseas branches focusing on marketing would be desirable; however, in case that it is difficult, regular seminars or visiting by marketing staff to targeted countries would be essentially considered. In reality, firstly, prior to establishment of overseas branches, a dispatch of marketing staff to targeting countries such as Japan (Tokyo), South Korea (Seoul), China (e.g. Lianyungang, Tianjin, Shanghai, Guangzhou) Russia, Iran, Azerbaijan, and so forth, is essentially required to cultivate customers through direct contacts or seminars regularly. Secondly, after intensive marketing, overseas branches must be selected.

Moreover, in order to promote more efficient marketing in foreign countries, integrated marketing in cooperation with other concerned institutions in domestic or foreign countries must be effectively established.

For example,

- Cooperation with Ministry of Industry and Trade

Ministry of Industry and Trade has a great deal of trade data and established close relationships with institutions in other countries. Trade expansion and a volume increase of transportation by rail in Kazakhstan have been positively related to each other. Close cooperation with Ministry of Industry and Trade is crucial. Moreover, in order to increase a volume of transit cargo passing through Kazakhstan between the east and the west, international seminars or exhibitions among Japan, South Korea, China, Kazakhstan, Russia, Iran Azerbaijan or eastern Europe and so forth, may be effective to promote trade. More cooperation with foreign stakeholders (public and private institutions) will also be essentially required.

- Cooperation with customs clearance authority

It is often pointed out that occasionally, shippers or consignees have some errors in descriptions of customs clearance documents, which leads to time-consuming and delayed procedures. It is very important to illustrate them a framework of customs clearance procedures properly. It would be better to assign permanent technical advisors in customs clearance in foreign marketing offices to consult. If it is impossible to assign permanent ones, instead, it is necessary to arrange a seminar regularly to consult for a few times a year.

A function of implementation must include not only a cultivation of current or potential customers but also information collection and analyses (e.g. micro information such as corporate cargo prospects, issues and support needs mainly as to rail transportation and so forth) or provisions of useful information to customers properly and timely.

b) Information provision to customers

Provision of useful information to domestic, foreign, current and potential customers must be implemented through various tools (inter-net: Home page etc).

A variety of information must be provided to customers in an effective way.

For example, information provision through home page:

1) Profiles of activities by KTZ and KTS

For example,

Information provision on a new transportation line, a block train formation, arrangement of seminars for industrial groups or corporations, latest tariffs of transportation by railway, a train schedule, current and future development plans in railway system in Kazakhstan or other countries, contents in case of law amendments in transportation by rail, profiles of border stations, address/TEL/FAX/e-mail of main stations, KTZ, KTS and other useful information

(The e-mail box of a home page provider (KTZ or KTS) must be set on a home page so that customers can send constraints and support needs to them.)

3: Strengthening a function of reviewing

It is very important to establish system to review outcomes in marketing and pursue more efficient

marketing. In particular, as a whole, it is essentially required to define responsibilities and rights of each function. Moreover, a focal point (a person in charge who takes a responsibility at each function) must be clearly defined.

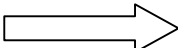
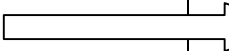
4: Strengthening a function of human resource development

Currently, human resource development of marketing at KTZ/KTS is based on ‘On-The-Job Training’. In order to develop human resources more in marketing, it is very important to understand current constraints in human resource development in marketing, to design proper training programs and implement them.

In particular, constraints to be deal with in the short term (e.g. capacity-building in how to make a data base efficiently, how to use analytical methods in data analyses, how to make a more efficient approach to customers, and so forth) and in the long term (e.g. proper training programs at each position) must be classified. In designing proper training programs, it is very important to consider using resources available not only in house but also outside such as resources of private consultants, donors.

In addition, it is very essential to set criteria (e.g. how degree of responsibilities are implemented) to assess a current ability of staff properly, which lead to more consideration to designing more efficient training programs.

Example: Human resources development items and schedule in marketing: (10 years)

Term	Items	1 st year	2	3	4	5	6	7	8	9	10		
Short	• Identification of constraint in human resources development • Design and Implementation • Basic training in marketing methods - Analytical tools for data etc • Establishment of Human resources evaluation		Implementation of every year										
				Implementation of every year									
					Implementation of every year								
Intermediate/ Long	• Identification of constraint in human resources development • Design and Implementation • Proper training programs at each Position etc			Implementation of every year									
					Implementation of every								

Appendix 8.1.3(1) Comparison in freights and transit time in case of a block train formation between Dostyk and Aktau for various origins and destinations.

(To Aktau)		Routes (Origin and destinations)	Mode of Transportation	Index of freight	Transit time to Aktau (Theoretical days)
Japan – Almaty- Aktau	A block train formation	Japan – Almaty- Aktau	A non block train formation Transportation mainly by sea	124	16 days (Japan-Lianyungang: 3, Lianyungang-Dostyk: 8, Dostyk-Aktau: 5)
	A non block train formation			124	21 days (Japan-Lianyungang: 3, Lianyungang-Dostyk: 8, Dostyk-Aktau: 10)
	Transportation mainly by sea			100	39 days (Japan –Bandar Abbas: 23, Bandar Abbas-Iran North port: 14, Iran North port-Aktau: 2)
S. Korea-Almaty- Aktau	A block train formation	S. Korea-Almaty- Aktau	A non block train formation Transportation mainly by sea	108	16 days (South Korea-Lianyungang: 3, Lianyungang-Dostyk: 8, Dostyk-Aktau: 5)
	A non block train formation			108	21 days (South Korea-Lianyungang: 3, Lianyungang-Dostyk: 8, Dostyk-Aktau: 10)
	Transportation mainly by sea			100	39 days (South Korea-Bandar Abbas: 23, Bandar Abbas-Iran North port: 14, Iran North port-Aktau: 2)
Lianyungang-Almaty-Aktau	A block train formation	Lianyungang-Almaty-Aktau	A non block train formation	96	13 days (Lianyungang-Dostyk: 8, Dostyk-Aktau: 5)
	A non block train formation			96	18 days (Lianyungang-Dostyk: 8, Dostyk-Aktau: 10)
	A block train formation			68	6.5 days (Urumqi-Dostyk: 1.5, Dostyk-Aktau: 5)
Urumqi-Almaty-Aktau	A non block train formation	Urumqi-Almaty-Aktau	A non block train formation	68	11.5 days (Urumqi-Dostyk: 1.5, Dostyk-Aktau: 10)

(To Baku)		Routes (Origin and destinations)	Mode of Transportation	Index of freight	Transit time to Baku (Theoretical days)
Japan – Almaty- Aktau-Baku	A block train formation	Japan – Almaty- Aktau-Baku	A non block train formation Transportation mainly by sea	156	17 days (Japan-Aktau: 16, Aktau-Baku: 1)
	A non block train formation			156	22 days (Japan-Aktau: 21, Aktau-Baku: 1)
	Transportation mainly by sea			100	37 days (Japan –Bandar Abbas: 23, Bandar Abbas-Baku: 14)
S. Korea-Almaty- Aktau-Baku	A block train formation	S. Korea-Almaty- Aktau-Baku	A non block train formation	138	17 days (South Korea-Aktau: 16, Aktau-Baku: 1)
	A non block train formation			138	22 days (South Korea-Aktau: 21, Aktau-Baku: 1)
	Transportation mainly by sea			100	37 days (South Korea –Bandar Abbas: 23, Bandar Abbas-Baku: 14)

Lianyungang-Almaty-Aktau-Baku	A block train formation	126	14 days (Lianyungang-13, Aktau-Baku:1)
	A non block train formation	126	19 days (Lianyungang-Aktau:18, Aktau-Baku:1)
Urumqi-Almaty-Aktau-Baku	A block train formation	95	7.5 days (Urumqi-Aktau: 6.5, Aktau-Baku: 1)
	A non block train formation	95	12.5 days (Urumqi-Aktau: 11.5, Aktau-Baku: 1)

(To North Iran)

Routes (Origin and destinations)	Mode of Transportation	Index of freight	Transit time to North Iran (Theoretical days)
Japan-Almaty-Aktau-North Iran	A block train formation	154	18 days (Japan-Aktau:16, Aktau-Iran North Port:2)
	A non block train formation	154	23 days (Japan-Aktau:21, Aktau-Iran North Port:2)
	Transportation mainly by sea	100	37 days (Japan -Bander Abbas:23, Bander Abbas-Iran North Port:14)
S.Korea-Almaty-Aktau-North Iran	A block train formation	136	18 days (South Korea-Aktau: 16, Aktau-Iran North Port:2)
	A non block train formation	136	23 days (South Korea-Aktau:21, Aktau-Iran North Port:2)
	Transportation mainly by sea	100	37 days (South Korea-Bander Abbas:23, Bander Abbas-Iran North Port:14)
Lianyungang-Almaty-Aktau-North Iran	A block train formation	123	15 days (Lianyungang-Aktau:13, Aktau-Iran North Port:2)
	A non block train formation	123	20 days (Lianyungang-Aktau:18, Aktau-Iran North Port:2)
	A block train formation	91	8.5 days (Urumqi-Aktau: 6.5, Aktau-Iran North Port: 2)
Urumqi-Almaty-Aktau-North Iran	A non block train formation	91	13.5 days (Urumqi-Aktau: 11.5, Aktau-Iran North Port: 2)

R1) Freight index: If the freight of transportation mainly by rail from Japan or South Korea to Aktau via Bander Abbas equals to 100, the index of freight of transportation mainly by rail from Japan to Aktau via Dostyk is 124. (Freight is not actual cost of carriers to transport but an amount that a customer needs to pay for transportation.)

R2) Transit time: the assumption that a block train formation from Dostyk to Aktau leads to less transit time of 5 days.

R3) It is assumed that it takes seven days from Lianyungang to Dostyk and one day to reload a container at Lianyungang and that it takes four days from Dostyk to Aktau and one day to reload a container at Dostyk.

R4) Freight by rail are simply calculated by adding current on going market freights from each origin to Almaty to tariffs of rail transportation between Almaty and Aktau.

In addition, empty container positioning cost to a place of loading after a delivery to a destination is also considered in freight calculation.

Appendix 8.1.3(2) Analysis on Freights and Transit Times

In consideration to a block train formation between Dostyk and Aktau, various issues such as competitiveness in freight or transit time of transportation against other competing routes must be carefully examined. With regard to transportation by rail between East Asian countries such as Japan, South Korea and China and Aktau, western area of Kazakhstan, via Dostyk, at current conditions, it is very difficult to estimate a cargo volume of containers if a block train between Dostyk and Aktau is arranged, due to the following reasons.

- a) Exporters or importers in East Asian countries such as Japan, South Korea and China, as well as in western area of Kazakhstan (e.g. Aktau) have not implemented sufficient marketing, which may lead to more transportation of container cargoes by rail between the two regions.
- b) Efficient transportation system to transport container cargoes by rail between East Asian countries and western area of Kazakhstan (e.g. Aktau) via Dostyk has not been sufficiently established due to various reasons such as an insufficient facilities to reload containers, a shortage of platforms or an inefficient inspection system of cargo at Dostyk, a lack of setting of effective tariffs or insufficient public activities to promote trade.

It may be regarded that several issues, such as a lack of positive marketing between East Asian countries and western area of Kazakhstan by corporations and an unstable transit time and schedule of transportation by rail or an insufficient supply of facilities and platforms, have adversely affected a cargo volume of containers to be transported by rail. Therefore, under the current conditions, it is very difficult to estimate a cargo volume of containers if a block train between Dostyk and Aktau is arranged. In order to estimate a future cargo volume of containers if a block train is arranged between Dostyk and Aktau, firstly, a comparison between the below two routes may be done in terms of transportation cost and transit time.

Comparison of two main routes

Two main routes;

- a) East Asia: Japan, South Korea or China - Bandar Abbas - Aktau route
(A main transportation mode: by sea.)
Japan, South Korea or China - Bandar Abbas: by sea
Bandar Abbas - Iran North port (e.g. Bandar Anzali port) : by truck
Iran North port - Aktau: by sea
- b) East Asia: Japan, South Korea or China - Lianyungang - Urumqi - Dostyk - Aktau route
(A main transportation mode: by rail.)
Japan, South Korea - Lianyungang: by sea
Lianyungang - Urumqi - Dostyk - Aktau: by rail

(A comparison between the two routes)

If a block train is arranged between Dostyk and Aktau, strengthness and weakness of the above two routes

must be carefully examined. (Notice: Though various freights are offered in the followings, these are based on interviews with corporations. Therefore, there may be various on-going freights.)

(Japan, South Korea or China - Bandar Abbas (Iran) - Aktau route = a main transportation mode: by sea)

Based on the study, it is estimated that the transit time from Japan or South Korea to Aktau (Japan or South Korea-BandarAbbas-Aktau: mainly by sea) is 39 days (=Japan or South Korea -BandarAbbas: 23 days by sea, Bandar Abbas -Iran north port: 14 days by truck, Iran north port-Aktau: 2 days).

(Japan, South Korea or China - Lianyungang (China)- Urumqi (China) - Dostyk - Aktau route = a main transportation mode: by rail.)

The freight indexes and transit times of various routes mainly transported by rail (Japan or South Korea-China - Dostyk - Aktau, assuming a block train formation between Dostyk and Aktau) are as follows (See Table 8.1-3-1)¹.

Table 8.1-3-1 Comparison in transportation freights and transit time if a block train between Dostyk and Aktau is arranged (Standard 40 Feet Container): estimation

Routes (Origin-Destination)	Mode of Transportation	Index of freight	Transit time to Aktau (Theoretical days)
Japan - Almaty- Aktau	A block train formation	124	16 days
	A non block train formation	124	21 days
	Transportation mainly by sea	100	39 days
S. Korea - Almaty- Aktau	A block train formation	108	16 days
	A non block train formation	108	21 days
	Transportation mainly by sea	100	39 days

Note: 1) Freight index: If the freight of transportation mainly by sea from Japan or South Korea to Aktau via Bandar Abbas equals to 100, the index of freight of transportation mainly by rail from Japan to Aktau via Dostyk is 124. (Freight is not actual cost of carriers to transport but an amount that a customer needs to pay for transportation.)

2) Transit time: the assumption that a block train formation from Dostyk to Aktau leads to less transit time of 5 days.

3) It is assumed that it takes seven days from Lianyungang to Dostyk and one day to reload a container at Lianyungang and that it takes four days from Dostyk to Aktau and one day to reload a container at Dostyk.

4) Freights by rail are simply calculated by adding current on going market freights from each origin to Almaty to tariffs of rail transportation between Almaty and Aktau. In addition, empty container positioning cost to a place of loading after a delivery to a destination is also considered in freight calculation.

Comprehensive analyses on freight and transit time

The transportation mainly by rail from Japan to Aktau via Dostyk is less advantageous in freight than that mainly by sea. The transportation mainly by rail from South Korea to Aktau via Dostyk is less advantageous in freight than that mainly by sea, but slightly competitive than Japan.

¹ Similar comparisons in transportation freights and transit time to destinations (Baku and Iran north port) are described in Appendix 8.1.3-1.

The transit time (16 days) of transportation mainly by rail from Japan or South Korea to Aktau via Dostyk is much more advantageous than that (39 days) of transportation mainly by sea. In comparison with freights and transit times in different transportation routes (mainly by rail or by sea), the transportation mainly by rail from east Asian countries such as Japan, South Korea to Aktau via Dostyk has less advantageous in freights than that by sea, but more advantageous in transit time than that mainly by sea.

Competitiveness must be comprehensively evaluated. For example, shorter transit time of transportation through a block train formation will lead to decrease of inventory and carrying costs of corporations. Shorter transit time will positively influence overall net profits of them. Therefore, it is dangerous to consider only freights to judge marketing conditions.

For another example, let assume that a corporation in Aktau finds materials with a certain level of quality to import at cheaper prices from East Asian countries, while they are currently imported from Europe. If a total cost (purchasing cost of materials, transportation cost and so forth) from these countries to Aktau is lower than one from Europe and a just-in time delivery of cargo is maintained, even though transportation cost itself from these countries is higher than that from Europe, a corporation will have a possibility to change a supply source from Europe to these countries. It must be noted that conditions of each company are quite different.

Moreover, China has been advantageous in freights and transit times than Japan and South Korea. However, in reality, a majority of cargoes transported through CLB are not from China but from Japan or South Korea because Japan or South Korea has comparative advantageous commodities such as second hand cars or auto assembly parts rather than China. Therefore, firstly, an approach through considering conditions comprehensively (e.g. freights and transit times, other issues; a degree of just-in-time delivery and so forth) to cultivate customers in East Asian countries must be positively implemented.

(4) Prospect of Cargo Volume if a Block Train is Arranged between Dostyk and Aktau

Under the current conditions, it is very difficult to estimate a cargo volume of containers if a block train between Dostyk and Aktau is arranged. If a block train composing of 50 platforms is arranged every week between Dostyk and Aktau through transporting from East Asian countries such as Japan, South Korea and China, a total quantity per year to be transported will be 5,200TEU (433 TEU per month). The share of this figure is 4.35% against the actual figure of cargo volume (59,805TEU) in 2005, passing through Dostyk to the west. In a similar way, several estimations are calculated in the below table (See Table 8.1-4).

Table 8.1-4 Quantity if a Block Train between Dostyk and Aktau is Arranged: Estimation

Frequency of a block train formation (time per week)	Total Volume Per year (TEU)	Share of a cargo volume against an annual total volume, passing through Dostyk to the west (%)			
		59,805 TEU (actual 2005)	70,000TEU (assumption)	80,000TEU (assumption)	90,000TEU (assumption)
0.5	2,600	4.35	3.71	3.25	2.89
1.0	5,200	8.69	7.43	6.50	5.78
1.5	7,800	13.04	11.14	9.75	8.67
2.0	10,400	17.39	14.86	13.00	11.56
2.5	13,000	21.74	18.57	16.25	14.44
3.0	15,600	26.08	22.29	19.50	17.33

Assumption: (1) One year: 52 weeks, one train: 50 cars (100TEUs)

E.g. 15,600= 3 time per week x 52weeks x 100TEU = 15,600TEU

Originally, these estimations must be done in concrete study. However, under the current conditions of limited cargoes transported from Dostyk to Aktau and insufficient arrangement of infrastructure of railway, there may be difficult to estimate a prospect and how many times of a block train should be arranged per month at this stage. Rather, as shown in the table 8.1-4, to begin with, it may be better firstly to consider how many times of a block train formation per month must be targeted and secondly to calculate how each prospect of containers to be transported has a share against the total annual volume (actual or potential) passing through from Dostyk to the west and thirdly to evaluate whether it is possible or not through cultivating customers against each prospect.

Under the conditions that (a) in-depth marketing has not been well implemented by corporations, (b) insufficient arrangement of infrastructure of transportation by rail between Dostyk and Aktau, and (c) a block train has not yet been arranged between Dostyk-Aktau, a potential cargo volume of containers is examined under various assumptions if a block train is arranged.

A description of import containers in tonnage and in value passing through Dostyk from the east to the west in 2004 and 2005 are follows. See Table 8.1-5)

Table 8.1-5 Imports Passing Through Dostyk in 2004-2005

Classification	2004			2005		
	Weight (ton)	Weight (%)	Value (US\$: 10,000)	Weight (ton)	Weight (%)	Value (US\$: 10,000)
Paper and paper pulp	22.9	0.7	132	208.1	0.7	1390
Finished foodstuffs	59.5	1.7	760	363.9	1.1	4,773
Wood and woodwork	9.2	0.3	56	259.4	0.8	1,844
Cereals and flour-and-cereals products		0.0		120.8	0.4	285
Feedstock, fabric, textile and products made of them	89.6	2.6	39	519.3	1.6	4,741
Machines, mechanism, equipment and apparatus, including electronics	204.1	5.9	4,644	1,036.7	3.2	100,374
Plastics and plastic products, and rubber goods	7.0	0.2	29	133.7	0.4	26,0.0
Plant products	41.1	1.2	131	138.8	0.4	4.9
Products of chemical industry	50.3	1.5	25	200.2	0.6	2,478
Construction materials	2,116.6	61.2	390	14,746.7	46.1	6,699
Consumer goods	90.3	2.6	241	576.8	1.8	6,452
Cement		0.0		2,983.2	9.3	1,651
Ferrous metals and non-ferrous metals and products made of them	62.5	1.8	162	1,385.7	4.3	30,413
Others	704.9	20.4	4,226	9,295.2	29.1	38,219
Total	3,458.0	100.0	10,835	31,968.5	100.0	225,798

Source: ‘The Study of current administrative conditions of transportation sector in People’s Republic of China 2006’

In terms of tonnage in 2005, the item of construction materials has a largest share of 46.1% (14,746.7tons), followed by cements 9.3% (2,983.2 tons), machines, mechanism, equipment and apparatus, including electronics3.2% (1,036.7 tons) and others such as vehicles 29.1% (9,295.2 tons).

The total weights of construction materials, cement and plant products in 2005 is 17,896 tons with 55.89 % of the total weights (31,968.5tons). Similarly, the total value of them in 2005 is US\$83.54 million with 3.69% of the total value (US\$2,257.98 million).

As described in Chapter 3.3.1., recently, investment in construction of oil and gas extraction plants has enormously increased in Mangystau region facing to the Caspian Sea. In particular, in 2004, investment in mining industry has reached to US\$5,245million (63.4% of all investment in 2004). Investment from 2001 to 2004 dramatically increased by 60%. Commodities such as construction materials, cement and plant products, passing through Dostyk from East Asian countries such as Japan, South Korea and China to the west will become possible to supply sources of materials or equipments for oil or gas plants in western area (Aktau, Atyrau etc) of Kazakhstan.

The total value of construction materials, cement and plant products in 2005 (US\$83.54 million), passing through Dostyk from East Asian countries to Kazakhstan corresponds to only 1.61% against the total

foreign investment (US\$5,425 million) in 2004. If it is assumed that 10 % (which is equivalent to US\$524.5 million of foreign investment; US\$5,425 million) is newly imported from East Asian countries, the total number of containers to be transported from these countries to western area of Kazakhstan, passing through Dostyk, will be 4,835 containers of 40 feet size (9,670TEU).

(Calculation method: 4,835 containers of 40 feet size (9,670 TEU))

- 1 It is assumed that 10 % of its total amount of foreign investment (US\$5,425 million) is newly imported from East Asia such as Japan, South Korea or China.

$$\text{US\$5,425 million} \times 0.10 = \text{US\$542.5 million}$$
- 2 In order to calculate weights to be transported for one year, US\$ 542.5 million is divided by US\$83.54 million (the total amounts in value of construction materials, cements and plant products, passing through Dostyk to the west in 2005) and multiplied by 17,896 tons (the total amounts in weight of construction materials, cements and plant products, passing through Dostyk to the west in 2005)

$$\text{US\$542.5 million} / \text{US\$83.54 million} \times 17,896 \text{ tons} = 116,039 \text{ tons}$$
- 3 Assuming that the weight stuffed into a 40 feet size container is 24 tons, the number of containers to be transported for one year is calculated through dividing 116,039 tons by 24 tons

$$116,039 \text{ tons} / 24 \text{ tons} = 4,835 \text{ of a 40 feet size container}$$
- 4 Assuming a block train formation with 50 cars (= 40 Feet size container X 50), a frequency of block train formation per month is calculated.

$$4,835 \text{ containers} / 50 \text{ cars} / 12 \text{ months} = 8.06 \text{ per a month}$$

The results of simulation, assuming that some supply sources for construction materials, cements and plant materials against the total foreign direct investment in mining sector (US\$5,425 million) in Kazakhstan are replaced from European and USA to East Asian countries such as Japan, South Korea, China and so forth, are as follows (See table 8.1-6);

Table 8.1-6 Estimation Results

Ratio (%) to total foreign investment to mining industry (US\$5,245million)	1.0%	3.0%	5.0%	10.0%	15.0%
Number of containers from East Asian Countries to Aktau via Dostyk (40feet size)	483	1,450	2,417	4,835	7,252
(TEU base)	967	2,901	4,835	9,670	14,505
Ratio (%) to 60,000 TEU (the total number of containers passing through Dostyk to the west: prospect in 2006)	1.61	4.83	8.06	16.12	24.17
Frequency of a block train formation per month	0.81	2.42	4.03	8.06	12.09

Note: Construction materials, cements and plant materials: in case that they are transported from East Asian countries such as Japan, South Korea and China to western area of Kazakhstan

The above analysis on a cargo prospect of containers between East Asian countries and Aktau via Dostyk is based on commodities (construction materials, cements and plant products). On the other hand, the number of new cars which is imported to Kazakhstan is 4,481 cars in 2003, 8,526 cars in 2004 and 12,918 cars in 2005. In particular, based on data in 2004, the top imported brand is Toyota, which sold 3,192 cars with a share of 37.4% against the total number of imports of cars to Kazakhstan (See the table 8.1.3-5). The aggregate share of Toyota, Nissan, Suzuki, Subaru and Hyundai is 58.2 % (4,961 cars) in 2004. If more efficient transportation system is arranged in CLB and in Kazakhstan, there may be a possibility of an increase of import of new cars from Japan or South Korea to western area of Kazakhstan.

Table 8.1-7 Units of new car sales in Kazakhstan (2004)

Name of Automobile company	Units	Share (%)
Toyota	3,192	37.4
UZ Daewoo	920	10.8
Chevrolet NIVA	720	8.4
Nissan	589	6.9
Hyundai	541	6.3
VW	457	5.4
Subaru	384	4.5
Skoda	300	3.5
Suzuki	255	3.0
Other	1,168	13.7
Total	8,526	100.0

Source: Russia NIS monthly Report December, 2006

As shown in the Table 8.1-5, in addition to construction materials, cements and plant products, other commodities such as motor vehicles, food stuff, textile, machines and electric appliances, which can be stuffed into containers, are imported to mainly Almaty via Dostyk, Kazakhstan. Therefore, a possibility to transport these commodities through a block train to western area of Kazakhstan must be carefully examined.

Appendix 8.1.3(3) (Marketing approach on transit cargoes passing through Kazakhstan: examples)**(1) Russia-China**

One of the essential elements to implement marketing on transit cargoes is to make a positive approach to customers with transit cargoes. For that purpose, it is very important to investigate current conditions of trades, international logistics and future prospects among concerned countries with transit cargoes passing through Kazakhstan. Currently, trades between Russia and China, passing through Kazakhstan are limited. For example, with regard to trade conditions between Russia and Xinjiang Uygur Autonomous Region, China, the value of exports to Russia from Xinjiang Uygur Autonomous Region in 2005 was US\$59.31 million (1.17% of the total amounts of exports from Xinjiang Uygur Autonomous Region) while imports were US\$174.69 million (6.02% of the total amounts of imports to Xinjiang Uygur Autonomous Region). The total amounts of exports and imports with Russia were US\$234 million with a share of only 2.95% in 2005. The largest trade partner of Xinjiang Uygur Autonomous Region is Kazakhstan with a share of 63.15% against the total amount of exports and imports in value.

The main export items from Xinjiang Uygur Autonomous Region in 2005 are tomato jam/paste (441,400 tons), followed by raw or yarn cotton and textiles (7,537 tons), sugar (3,006 tons,) medical materials (2,910 tons) and so forth, while the main import items to Xinjiang Uygur Autonomous Region in 2005 are cattle and horse hides (27,631 tons), woods (3,097 tons) and paper (765 tons). (details are described in Chapter 4.1.3)

On the other hand, as shown in the below table, as a whole, Russia mainly exports mineral resources, general commodities, iron and steel etc and imports machinery and mechanical appliances/parts, vehicles, electrical machinery and general commodities etc. In particular, in relation to China, Russia mainly exports iron and steel, wood and articles of wood and imports machinery and mechanical appliances/parts and electrical machinery/equipment/parts.

(Russia Trade condition)

Export (2005: USD241,241 Million)					
Item		Country		Export Value (US\$ million)	Share out of All Exports (%)
1	Mineral fuels, mineral oils and products of their distillation) Total USD 118.241million [Equivalent to 49.0% of all exports]	1	Netherlands	19,632	16.6
		2	Italy	12,557	10.6
		3	Germany	9,843	8.3
		4	Poland	6,443	5.4
		5	Others	69,766	59.0
		Total		118,241	100
2	Commodities not specified according to kind) Total: USD 50,457million [Equivalent to 20.9% of all exports]	1	Special categories	40,363	80.0
		2	Belarus	10,093	20.0
		3	Finland	0.2	0
		Total		50,457	100
3	Iron and Steel Total: USD 17,875million [Equivalent to 7.4% of all exports]	1	Turkey	2,013	11.3
		2	China	1,519	8.5
		3	USA	1,324	7.4
		4	Italy	1,293	7.2
		5	Others	11,726	72.8
		Total		17,875	100
4	Aluminum and Articles Total: USD 5,690million [Equivalent to 2.4% of all exports]	1	Portugal	1,301	22.7
		2	Japan	1,264	22.1
		3	USA	1,001	17.5
		4	Netherlands	528	9.2
		5	Others	1,596	28.5
		Total		5,690	100
5	Wood and articles of wood; wood charcoal Total: USD 5,690million [Equivalent to 2.4% of all exports]	1	China	1,473	25.9
		2	Finland	785	13.8
		3	Japan	594	10.4
		4	Egypt	225	4.0
		5	Others	1,446	45.9
		Total		4,523	100

Import (2005: USD 98,573 Million)					
Item		Country		Import Value (US\$ million)	Share out of All imports (%)
1	Machinery and Mechanical appliances; parts) Total: USD 15,703million [Equivalent to 15.9% of all imports]	1	Germany	3,641	23.2
		2	Italy	1,828	11.6
		3	China	1,421	9.1
		4	USA	972	6.2
		5	Others	7,841	49.9
		Total		15,703	100
2	Vehicles other than railway or tramway rolling stock Total: USD 11,257million [Equivalent to 11.4% of all imports]	1	Japan	3,688	32.8
		2	Germany	1,840	16.3
		3	South Korea	1,098	9.8
		4	UK	857	7.6
		5	Others	3,774	33.5
		Total		11,257	100
3	Electrical machinery and equipment and parts thereof; sound recorders Total: USD 9,919million [Equivalent to 10.1% of all imports]	1	China	1,864	18.8
		2	Germany	1,640	16.5
		3	South Korea	994	10.0
		4	Finland	727	7.3
		5	Others	4,694	47.4
		Total		9,919	100
4	Commodities not specified according to kind Total: USD 6,188million [Equivalent to 6.3% of all imports]	1	Belarus	5,713	92.3
		2	Other Area	474	7.7
		3	Ukraine	0.016	
		Total		6,188	100
5	Pharmaceutical products) Total: USD4,311 million [Equivalent to 4.4% of all imports]	1	Germany	882	20.5
		2	France	522	12.1
		3	India	290	6.7
		4	Hungry	282	6.6
		5	Others	2,355	54.1
		合計		4,311	100

Source:: UNCTAD UNComtrade

Under the current trade conditions, in pursuit of more transit cargoes, passing through Kazakhstan railway, it is essentially required to implement intensive marketing to Russian and Chinese corporations that mutually export or import items such as machinery and mechanical appliances/parts, electrical machinery/equipment/parts and wood and articles of wood, which can be stuffed into a container.

In particular, while Russia exports wood and articles of wood to China, Xinjiang Uygur Autonomous Region also imports wood from foreign countries, including Russia. From now on, intensive marketing to Russian or Chinese corporations (in particular, corporations in Xinjiang Uygur Autonomous Region) which trade woods are essentially required.

Moreover, as to general commodities, raw, yarn cotton and textiles, are one of main export items of Xinjiang Uygur Autonomous Region. Intensive marketing to customers with these items which can be transported by a container, passing through Kazakhstan railway must be implemented in Russia and Xinjiang Uygur Autonomous Region.

As illustrated, marketing based on analyses of international trade or logistics conditions must be implemented. Currently, marketing to foreign customers are not sufficient. Therefore, firstly, information collection from various sources as well as establishment of relationships with concerned public and private institutions, are required. (Chamber of Commerce and Industry, industrial groups and public institutions such as trade promotion bureau and private corporations will be supply sources of effective information.)

(Remarks)

Based on data from Russia & NIS Business Monthly Report Sep-Oct., 2006 at Japan Association for trade with Russia & NIS, a volume of export item (woods) from Russia to China is as follows:

(Export volume from Russia to China 2006)

Items	Volume to China	Total export volume to the world
General wood and articles of wood	16,296,999 M3	34,305,307 M3
Oak	609,758 M3	670,248 M3
Other woods	905,925 M3	14,281,125 M3

(2) Ukraine-China

Geographically, corporations in eastern Europe may have more possibility to trade transit cargoes of containers, passing through Kazakhstan than ones in other areas. Therefore, let consider Ukraine, which is located in eastern Europe, in the followings.

As shown in the below table, as a whole, Ukraine mainly exports iron and steel and its articles, mineral resources etc and imports mineral resources, nuclear reactors, boilers, machinery, vehicles, electrical machinery and plastics and articles etc. In particular, in relation to China, Ukraine mainly imports nuclear reactors, boilers, machinery, electrical machinery and plastics and articles etc, which are transported mainly by sea.

Under the current trade conditions, in pursuit of more transit cargoes, passing through Kazakhstan railway, it is essentially required to implement intensive marketing to importers in Ukraine and exporters in China with regard to items such as nuclear reactors, boilers, machinery, electrical machinery and plastics and articles, which can be stuffed into a container.

(Moreover, many vehicles are imported from Japan and South Korea. It is also essentially required to implement intensive marketing to importers in Ukraine and exporters in Japan and South Korea with regard to them.)

(Ukraine Trade condition)

Export (2006: USD38,365 Million)					
Item		Country		Export Value (US\$ million)	Share out of All Exports (%)
1	Iron and Steel Total USD 13,051million [Equivalent to 34.0% of all exports]	1	Russia	1,479	11.3
		2	Turkey	1,438	11.0
		3	Italy	1,117	8.6
		4	USA	728	5.6
		5	Others	8,289	63.5
		Total		13,051	100
2	Mineral fuels, mineral oils and products of their distillation Total: USD 2,553million [Equivalent to 6.7% of all exports]	1	Italy	578	22.6
		2	Moldova	209	8.2
		3	Cyprus	184	7.2
		4	Hungary	155	6.1
		5	Others	1,427	55.9
		Total		2,553	100
3	Articles of Iron and Steel Total: USD 2,361million [Equivalent to 6.2% of all exports]	1	Russia	1,105	46.8
		2	Kazakhstan	142	6.0
		3	Germany	107	4.5
		4	Belarus	98	4.2
		5	Others	909	38.5
		Total		2,361	100
4	Nuclear reactors, boilers, machinery Total: USD 2,051million [Equivalent to 5.3% of all exports]	1	Russia	1,136	55.4
		2	Belarus	116	5.7
		3	Kazakhstan	101	4.9
		4	India	82	4.0
		5	Others	616	30.0
		Total		2,051	100
5	Cereal Total: USD 1,354million [Equivalent to 3.5% of all exports]	1	Saudi Arabia	338	25.0
		2	Israel	100	7.5
		3	Tunisia	76	5.6
		4	Jordan	66	4.9
		5	Others	774	57.0
		Total		1,354	100

Import (2006: USD 45,019 Million)					
Item		Country		Import Value (US\$ million)	Share out of All imports (%)
1	Machinery and Mechanical appliances; parts) Total: USD 12,711million [Equivalent to 28.2% of all imports]	1	Russia	6,939	54.6
		2	Turkmenistan	3,487	27.4
		3	Kazakhstan	713	5.6
		4	Belarus	475	3.7
		5	Others	1,097	8.7
		Total		12,711	100
2	Nuclear reactors, boilers, machinery Total: USD 5,191million [Equivalent to 11.5% of all imports]	1	Russia	1,122	21.6
		2	Germany	1,110	21.2
		3	Italy	496	9.6
		4	China	278	5.4
		5	Others	2,185	42.2
		Total		5,191	100
3	Vehicles other than railway or tramway rolling stock Total: USD 4,898million [Equivalent to 10.9% of all imports]	1	Russia	962	19.7
		2	Germany	655	13.4
		3	Japan	640	13.1
		4	South Korea	461	9.4
		5	Others	2,180	44.4
		Total		4,898	100
4	Electrical machinery and equipment and parts thereof; sound recorders Total: USD 2,682million [Equivalent to 6.0% of all imports]	1	Germany	407	15.2
		2	China	398	14.9
		3	Sweden	299	11.2
		4	Russia	287	10.7
		5	Others	1,291	48.0
		Total		2,682	100
5	Plastics and articles Total: USD 1,988million [Equivalent to 4.4% of all imports]	1	Germany	272	13.7
		2	China	238	12.0
		3	Russia	205	10.3
		4	Poland	184	9.3
		5	Others	3,412	54.7
		合 計		1,988	100

Source:: UNCTAD UNComtrade

(3) Iran-China

The main export items from China to Iran in 2005 are (a) machine, electric appliances and parts, followed by (b) materials for textile and textile products, (c) vehicles, aircrafts, ships and transportation facilities, (d) metal and metal based products and (e) chemical and related products (see the below table).

(Main export items from China to Iran in 2005)

Rank	Items	Value (US Million)	Share (%) against total export (US\$3,296.545 million)
1	Machine, electric appliances and parts	981.826	29.7
2	Materials for textile and textile products	505.193	15.3
3	Vehicles, ships and transportation facilities	478.703	14.5
4	Metal and metal based products	373.300	11.3
5	Chemical and related products	264.294	8.01
6	Others	693.229	21.1
Total		3,296.545	

Prepared from JTERO, (China External Trade Statistics 2005)

Most of these items are mainly transported by sea from a coastal area in China to Iran. On the other hand, with regard to trade conditions between Iran and Xinjiang Uygur Autonomous Region, China, the value of exports to Iran from Xinjiang Uygur Autonomous Region in 2005 was US\$12.42 million

(0.24% of the total amounts of exports from Xinjiang Uygur Autonomous Region) while imports were US\$0.3 million (0.0001% of the total amounts of imports to Xinjiang Uygur Autonomous Region from Iran). The total amounts of exports and imports of Xinjiang Uygur Autonomous Region with Iran were US\$12.72 million with a share of 0.16% in 2005. Trade between Xinjiang Uygur Autonomous Region and Iran has not been well established. (details of figures are described in Chapter 4.1.3 and Appendix 4.1.3-2 China-Iran trade in 2003-2005)

Currently, while the main export items from Xinjiang Uygur Autonomous Region are tomato jam/paste (441,400 tons) and raw or yarn cotton and textiles (7,537 tons) and so forth. As above mentioned, materials for textile and textile products (US\$505.193million with a share of 15.3%) are ranked as the 2nd position of total exports from China to Iran in 2005. There is a possibility that the item (materials for textile and textile products) can be one of main exports from Xinjiang Uygur Autonomous Region to Iran.

In addition, as described in Appendix 8.3-1, much of steel are transported from Russia to North Iran port by sea. Under the current circumstances, item (steel) are not one of main export items of Xinjiang Uygur Autonomous Region, but there is a possibility that it can be one of the main items to be exported if great industrial development occurs in Xinjiang Uygur Autonomous Region or a block train formation is arranged between Dostyk and Aktau. In this way, intensive marketing to cultivate customers with possible items would be essentially required.

(The main export item from Iran to China is mineral products (US\$6,428 million with a share of 94.7%) against the total export value (US\$6,787million) to China. Iran has a unique export structure to China)

(4) Azerbaijan-China

The main export items from China to Azerbaijan in 2005 are as shown in the below table. Currently, the total amount of imports from China to Azerbaijan in 2005 is US\$62.95million with a share of only 1.6% against that from all over the world to Azerbaijan. The main trade (import) partners to Azerbaijan are CIS (34.4%), EU (29.6%).

In terms of quantity, gas, water and electric meter equipments, vacuum cleaners, brocks, telephone sets, pump, are mainly imported. These items are imported from China coastal areas to Azerbaijan by sea. These items are not main export items of Xinjiang Uygur Autonomous Region. However, there is a possibility that it can be one of the main items to be exported if great industrial development occurs in Xinjiang Uygur Autonomous Region or a block train formation is arranged between Dostyk and Aktau. In this way, intensive marketing to cultivate customers with possible items would be essentially required.

Main export items from China to Azerbaijan in 2005

Items	Quantity	Value
Gas, water and electric meter equipments	430,638.0	538.7
Vacuum cleaners	100,394.0	82.1
Brocks	62,316.0	279.7
Telephone sets	64,131.0	300.7
Pump	35,373.0	799.2
Shoes	24,699.0	1,266.1
Electric transformer	19,427.0	10.9
Seats	15,597.0	61.9
Pipe-line (steel)	2,470.1	334.4
Washing machine	2,173.0	16.9
Computer	2,072.0	198.4
Bricks	1,176.5	125.6
Refrigerator	1,494.0	185.9
Drill tubes (steel)	589.7	900.6
Plastic bottle, box and so forth	500.5	21.3

Plastic bottle, box and so forth	500.5	21.3
Ceramic	375.9	133.5
Tractor	291.0	706.8
Self cohesive tape and so forth	290.2	15.4
Fresh fruits	280.6	7.8
Veneer plate	269.3	7.4
Lorry	152.0	58.5
Tube	113.4	10.6
Water diagnostic apparatus	85.0	94.8
Bus	52.0	361.0
Furniture	45.7	379.2
Rubber tire	26.9	26.3
Electric diagnostic apparatus	27.0	1.5
Total	-	6,925.2

Prepared from 'The foreign trade of Azerbaijan 2001-2005'

(The main export item from Azerbaijan to China is mineral products (US\$89.45million), alcohol products (US\$2.36million) and so forth.)

Appendix 8.1.3(4) Outline of the Main Ports in Republic of Iran

Cargoes transported to Aktau, a western region of Kazakhstan from East Asian countries can be either direct cargoes to Mangystau region or transit cargoes to other countries' destinations facing to Caspian Sea. Therefore, it is very important in marketing to obtain information such as what kind of commodities are currently transported by sea to other countries' destinations facing to Caspian Sea. In the following, as an example, current conditions of imports at Iran north ports facing to Caspian Sea are described.

Main ports facing to Caspian Sea in Iran are Bandar Anzali port, Bandar Nowshahr port, Bandar Amir Abad port. There is a possibility that items which are currently imported to these ports from current supply sources may be replaced by ones which will be newly transported as a transit cargo via Aktau from East Asian countries to these ports in future. Profiles of current commodities which are transported to these ports from foreign countries are in the followings; (Data source: Current Administrative and Market conditions of Transportation Sector in Azerbaijan 2006)

(Bandar Anzali port)

Major import items to Bandar Anzali port are steel, oil materials, woods, barley and so forth; in particular, steel has a high share (83.1%) of imports in weights.

Major import items in 2005

	Item	Weight (ton)	Share (%)	Remarks
	Steel	2,730,957	83.1	Total weights: 3,286,963 tons
2	Oil materials	239,501	7.3	
3	Woods	159,124	4.8	
4	Barley	37,586	1.1	
5	Chemical products	36,070	0.6	

In terms of weights that were dealt with at Bandar Anzali port in 2005, Russian vessels(76%), Iranian vessels (16%), Azerbaijan (8%) transport respectively

(Bandar Nowshahr port)

Major import items to Bandar Nowshahr port are steel, paper, woods and so forth; in particular, steel has a high share (62.9%) of imports in weights.

Major import items in 2005

	Item	Weight (ton)	Share (%)	Remarks
1	Steel	558,600	62.9	Total weights: 887,737 tons
2	Paper	130,812	14.7	
3	Woods	124,811	14.0	
4	Chemical products	5,766	0.64	
5	Container cargo	2,036	0.22	

Calling conditions of vessels to Bandar Nowshahr port are as follows; in particular, there are many callings from Russia and Turkmenistan to Bandar Nowshahr port.

No. of vessels' calling to Bandar Nowshahr port in 2005

	Country (port)	No. of vessels' calling to Bandar Nowshahr port	Remarks
1	Russia (Astrakhan)	277	The total number of calling of vessels to Bandar Nowshahr port: 477
2	Turkmenistan (Turkmenbashi)	64	
3	Azerbaijan (Baku)	35	
4	Russia(Mahatchkala)	26	
5	Kazakhstan (Aktau)	24	

(Bandar Amir Abad port)

Major import items to Bandar Amir Abad port are steel, barley, woods and so forth; in particular, steel has a high share (57.7%) of imports in weights.

Major import items in 2005

	Item	Weight (ton)	Share (%)	Remarks
1	Steel	457,633	57.7	Total weights: 792,336 tons
2	Barley	130,653	16.4	
3	Woods	55,790	7.0	
4	Cereal	42,924	5.4	
5	Chemical products	42,113	5.3	

Major countries for imports to Bandar Amir Abad port are Russia 74.3%, Kazakhstan 22.7% in 2005. The total weight 180,200 tons (Steel: 127,211tons and Barley: 50,753tons) are imported from Kazakhstan. In addition, used machinery (200 tons) is also imported from Kazakhstan.

Appendix10-1 Detail Cost Benefit Result of Feasibility Study for Dostyk Terminal

Discount rate = 12% Unit: million KZT

Seq. No.	Year	Investment Cost	Annual O & M Cost	Total Cost	Net Benefit	VOC Saving	Maintenance Cost Saving	Total Benefit
-2	2008	1,202.763	0.000	1,202.763	-1,202.763	0.000	0.000	0.000
-1	2009	479.070	0.000	479.070	-479.070	0.000	0.000	0.000
1	2010	0.000	826.538	826.538	1,019.847	1,476.084	370.301	1,846.385
2	2011	0.000	1,119.739	1,119.739	1,497.564	2,092.390	524.912	2,617.303
3	2012	0.000	1,400.698	1,400.698	2,021.110	2,735.549	686.260	3,421.809
4	2013	0.000	1,669.928	1,669.928	2,591.438	3,406.728	854.637	4,261.365
5	2014	0.000	1,927.917	1,927.917	3,209.584	4,107.151	1,030.350	5,137.501
6	2015	0.000	2,175.135	2,175.135	3,876.673	4,838.090	1,213.719	6,051.809
7	2016	0.000	2,412.032	2,412.032	4,593.919	5,600.875	1,405.077	7,005.952
8	2017	0.000	2,639.039	2,639.039	5,362.627	6,396.894	1,604.772	8,001.665
9	2018	0.000	2,639.039	2,639.039	5,362.627	6,396.894	1,604.772	8,001.665
10	2029	96.422	2,639.039	2,735.461	5,266.205	6,396.894	1,604.772	8,001.665
11	2020	0.000	2,639.039	2,639.039	5,362.627	6,396.894	1,604.772	8,001.665
12	2021	0.000	2,639.039	2,639.039	5,362.627	6,396.894	1,604.772	8,001.665
13	2022	0.000	2,639.039	2,639.039	5,362.627	6,396.894	1,604.772	8,001.665
14	2023	0.000	2,639.039	2,639.039	5,362.627	6,396.894	1,604.772	8,001.665
15	2024	830.214	2,639.039	3,469.253	4,532.412	6,396.894	1,604.772	8,001.665
16	2025	0.000	2,639.039	2,639.039	5,362.627	6,396.894	1,604.772	8,001.665
17	2026	0.000	2,639.039	2,639.039	5,362.627	6,396.894	1,604.772	8,001.665
18	2027	0.000	2,639.039	2,639.039	5,362.627	6,396.894	1,604.772	8,001.665
19	2028	0.000	2,639.039	2,639.039	5,362.627	6,396.894	1,604.772	8,001.665
20	2039	96.422	2,639.039	2,735.461	5,266.205	6,396.894	1,604.772	8,001.665
21	2030	0.000	2,639.039	2,639.039	5,362.627	6,396.894	1,604.772	8,001.665
22	2031	0.000	2,639.039	2,639.039	5,362.627	6,396.894	1,604.772	8,001.665
23	2032	0.000	2,639.039	2,639.039	5,362.627	6,396.894	1,604.772	8,001.665
24	2033	0.000	2,639.039	2,639.039	5,362.627	6,396.894	1,604.772	8,001.665
25	2034	56.158	2,639.039	2,695.197	5,306.469	6,396.894	1,604.772	8,001.665
26	2035	0.000	2,639.039	2,639.039	5,362.627	6,396.894	1,604.772	8,001.665
27	2036	0.000	2,639.039	2,639.039	5,362.627	6,396.894	1,604.772	8,001.665
28	2037	0.000	2,639.039	2,639.039	5,362.627	6,396.894	1,604.772	8,001.665
29	2038	0.000	2,639.039	2,639.039	5,362.627	6,396.894	1,604.772	8,001.665
30	2039	-277.931	2,639.039	2,361.108	5,640.558	6,396.894	1,604.772	8,001.665
Total		2,483.118	72,229.881	74,712.999	139,667.430	171,385.421	42,995.008	214,380.430

B/C Ratio = 2.53 EIRR = 70.01 % NPV = 19,762 million KZT

Appendix10-2 Detail Financial Analysis Result of Feasibility Study for Dostyk Terminal (Plan 1)

Unit: million KZT

Seq. No.	Year	Investment Cost	Annual O & M Cost	Total Cost	Net Revenues	Annual Revenues	Corporation Tax (30%)
-2	2008	1,513.483	0.000	1,513.483	-1,513.483	0.000	0.000
-1	2009	581.507	0.000	581.507	-581.507	0.000	0.000
1	2010	0.000	899.810	899.810	47.684	947.494	0.000
2	2011	0.000	1,218.850	1,218.850	153.074	1,371.924	0.000
3	2012	0.000	1,524.569	1,524.569	307.551	1,832.120	0.000
4	2013	0.000	1,817.525	1,817.525	450.845	2,330.607	62.237
5	2014	0.000	2,098.250	2,098.250	623.391	2,870.082	148.441
6	2015	0.000	2,367.255	2,367.255	834.847	3,453.422	251.321
7	2016	0.000	2,625.029	2,625.029	1,087.020	4,083.699	371.651
8	2017	0.000	2,872.040	2,872.040	1,381.877	4,764.191	510.273
9	2018	0.000	2,872.040	2,872.040	1,373.298	4,764.191	518.852
10	2019	125.200	2,872.040	2,997.240	1,239.519	4,764.191	527.431
11	2020	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
12	2021	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
13	2022	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
14	2023	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
15	2024	1,078.000	2,872.040	3,950.040	278.140	4,764.191	536.010
16	2025	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
17	2026	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
18	2027	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
19	2028	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
20	2029	125.200	2,872.040	2,997.240	1,230.940	4,764.191	536.010
21	2030	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
22	2031	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
23	2032	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
24	2033	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
25	2034	70.000	2,872.040	2,942.040	1,286.140	4,764.191	536.010
26	2035	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
27	2036	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
28	2037	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
29	2038	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
30	2039	-329.920	2,872.040	2,542.120	1,686.060	4,764.191	536.010
Total		3,163.470	78,608.217	81,771.687	31,583.631	126,465.732	13,110.414

Project FIRR = 23.49 % NPV at 4.14% int. = 13,288 million KZT

Appendix10-2 Detail Financial Analysis Result of Feasibility Study for Dostyk Terminal (Plan 2)

Unit: million KZT

Seq. No.	Year	Investment Cost	Annual O & M Cost	Total Cost	Net Revenues	Annual Revenues	Corporation Tax (30%)
-2	2008	1,513.483	0.000	1,513.483	-1,513.483	0.000	0.000
-1	2009	581.507	0.000	581.507	-581.507	0.000	0.000
1	2010	0.000	899.810	899.810	47.684	947.494	0.000
2	2011	0.000	1,218.850	1,218.850	153.074	1,371.924	0.000
3	2012	0.000	1,524.569	1,524.569	267.699	1,832.120	39.852
4	2013	0.000	1,817.525	1,817.525	408.973	2,330.607	104.109
5	2014	0.000	2,098.250	2,098.250	587.501	2,870.082	184.331
6	2015	0.000	2,367.255	2,367.255	804.938	3,453.422	281.229
7	2016	0.000	2,625.029	2,625.029	1,063.093	4,083.699	395.578
8	2017	0.000	2,872.040	2,872.040	1,363.931	4,764.191	528.219
9	2018	0.000	2,872.040	2,872.040	1,361.334	4,764.191	530.816
10	2019	125.200	2,872.040	2,997.240	1,233.537	4,764.191	533.413
11	2020	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
12	2021	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
13	2022	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
14	2023	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
15	2024	1,078.000	2,872.040	3,950.040	278.140	4,764.191	536.010
16	2025	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
17	2026	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
18	2027	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
19	2028	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
20	2029	125.200	2,872.040	2,997.240	1,230.940	4,764.191	536.010
21	2030	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
22	2031	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
23	2032	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
24	2033	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
25	2034	70.000	2,872.040	2,942.040	1,286.140	4,764.191	536.010
26	2035	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
27	2036	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
28	2037	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
29	2038	0.000	2,872.040	2,872.040	1,356.140	4,764.191	536.010
30	2039	-329.920	2,872.040	2,542.120	1,686.060	4,764.191	536.010
Total		3,163.470	78,608.217	81,771.687	31,376.290	126,465.732	13,317.755

Project FIRR = 23.10 % NPV at 3.45% int. = 13,140 million KZT

Appendix10-2 Detail Financial Analysis Result of Feasibility Study for Dostyk Terminal (Plan 3)

Unit: million KZT

Seq. No.	Year	Investment Cost	Annual O & M Cost	Total Cost	Net Revenues	Annual Revenues	Corporation Tax (30%)
-2	2008	1,513.483	0.000	1,513.483	-1,513.483	0.000	0.000
-1	2009	581.507	0.000	581.507	-581.507	0.000	0.000
1	2010	0.000	899.810	899.810	47.684	947.494	0.000
2	2011	0.000	1,218.850	1,218.850	152.928	1,371.924	0.147
3	2012	0.000	1,524.569	1,524.569	261.061	1,832.120	46.489
4	2013	0.000	1,817.525	1,817.525	404.933	2,330.607	108.149
5	2014	0.000	2,098.250	2,098.250	586.058	2,870.082	185.774
6	2015	0.000	2,367.255	2,367.255	806.093	3,453.422	280.074
7	2016	0.000	2,625.029	2,625.029	1,066.845	4,083.699	391.825
8	2017	0.000	2,872.040	2,872.040	1,369.714	4,764.191	522.437
9	2018	0.000	2,872.040	2,872.040	1,368.928	4,764.191	523.222
10	2019	125.200	2,872.040	2,997.240	1,242.942	4,764.191	524.008
11	2020	0.000	2,872.040	2,872.040	1,367.356	4,764.191	524.794
12	2021	0.000	2,872.040	2,872.040	1,366.571	4,764.191	525.579
13	2022	0.000	2,872.040	2,872.040	1,365.785	4,764.191	526.365
14	2023	0.000	2,872.040	2,872.040	1,365.000	4,764.191	527.150
15	2024	1,078.000	2,872.040	3,950.040	286.214	4,764.191	527.936
16	2025	0.000	2,872.040	2,872.040	1,363.429	4,764.191	528.722
17	2026	0.000	2,872.040	2,872.040	1,362.643	4,764.191	529.507
18	2027	0.000	2,872.040	2,872.040	1,361.857	4,764.191	530.293
19	2028	0.000	2,872.040	2,872.040	1,361.071	4,764.191	531.079
20	2029	125.200	2,872.040	2,997.240	1,235.086	4,764.191	531.864
21	2030	0.000	2,872.040	2,872.040	1,359.718	4,764.191	532.432
22	2031	0.000	2,872.040	2,872.040	1,359.718	4,764.191	532.432
23	2032	0.000	2,872.040	2,872.040	1,359.718	4,764.191	532.432
24	2033	0.000	2,872.040	2,872.040	1,359.718	4,764.191	532.432
25	2034	70.000	2,872.040	2,942.040	1,289.718	4,764.191	532.432
26	2035	0.000	2,872.040	2,872.040	1,359.718	4,764.191	532.432
27	2036	0.000	2,872.040	2,872.040	1,359.718	4,764.191	532.432
28	2037	0.000	2,872.040	2,872.040	1,359.718	4,764.191	532.432
29	2038	0.000	2,872.040	2,872.040	1,359.718	4,764.191	532.432
30	2039	-329.920	2,872.040	2,542.120	1,689.638	4,764.191	532.432
Total		3,163.470	78,608.217	81,771.687	31,504.311	126,465.732	13,189.734

Project FIRR = 23.12 % NPV at 2.13% int. = 13,197 million KZT

Unit: million KZT

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Annual	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

Profit & Loss Statement

Revenue				947.494	1371.924	1832.120	2330.607	2870.082	3453.422	4083.699	4764.191	4764.191	4764.191	4764.191	4764.191	4764.191	4764.191	4764.191	4764.191	4764.191	4764.191	4764.191	4764.191	4764.191	4764.191	4764.191	4764.191	4764.191
Expense				899.810	1218.850	1524.569	1817.525	2098.250	2367.255	2625.029	2872.040	2872.040	2872.040	2872.040	2872.040	2872.040	2872.040	2872.040	2872.040	2872.040	2872.040	2872.040	2872.040	2872.040	2872.040	2872.040	2872.040	2872.040
Depreciation				105.449	105.449	105.449	105.449	105.449	105.449	105.449	105.449	105.449	105.449	105.449	105.449	105.449	105.449	105.449	105.449	105.449	105.449	105.449	105.449	105.449	105.449	105.449	105.449	105.449
Interest				47.137	47.137	47.137	47.137	47.137	47.137	47.137	45.246	42.627	40.008	37.389	34.770	32.151	29.533	26.915	24.296	21.677	19.058	16.439	13.820	11.928	11.928	11.928	11.928	11.928
Profits before tax				-104.902	0.489	154.965	360.496	619.246	933.582	1306.085	1741.455	1744.074	1746.693	1749.312	1751.931	1754.550	1757.168	1759.786	1762.405	1765.024	1767.643	1770.262	1772.881	1774.773	1774.773	1774.773	1774.773	1774.773
Corporate tax				0.000	0.147	46.489	108.149	185.774	280.074	391.825	522.437	523.222	524.008	524.794	525.579	526.365	527.150	527.936	528.722	529.507	530.293	531.079	531.864	532.432	532.432	532.432	532.432	532.432
Profits after tax				-104.902	0.342	108.476	252.347	433.472	653.508	914.260	1219.018	1220.852	1222.685	1224.518	1226.352	1228.185	1230.018	1231.850	1233.683	1235.517	1237.350	1239.183	1241.017	1242.341	1242.341	1242.341	1242.341	1242.341
Dividend									-52.375	-52.375	-52.375	-52.375	-64.895	-64.895	-64.895	-64.895	-64.895	-64.895	-64.895	-64.895	-64.895	-64.895	-64.895	-64.895	-64.895	-64.895	-64.895	-64.895
Benefits				-104.902	0.342	108.476	252.347	433.472	601.133	861.885	1166.644	1168.477	1157.790	1159.624	1161.457	1163.290	1165.123	1166.955	1168.788	1170.621	1172.454	1174.287	1176.119	1177.952	1179.785	1181.618	1183.451	1185.284
Amount of benefit				-104.902	-104.560	3.916	256.263	689.735	1290.868	2152.753	3319.396	4487.873	5645.664	6805.287	7966.744	9130.034	10295.157	11354.312	12415.301	13478.123	14542.778	15609.267	16665.069	17722.195	18779.321	19836.447	20893.573	21943.700

Balance Sheet

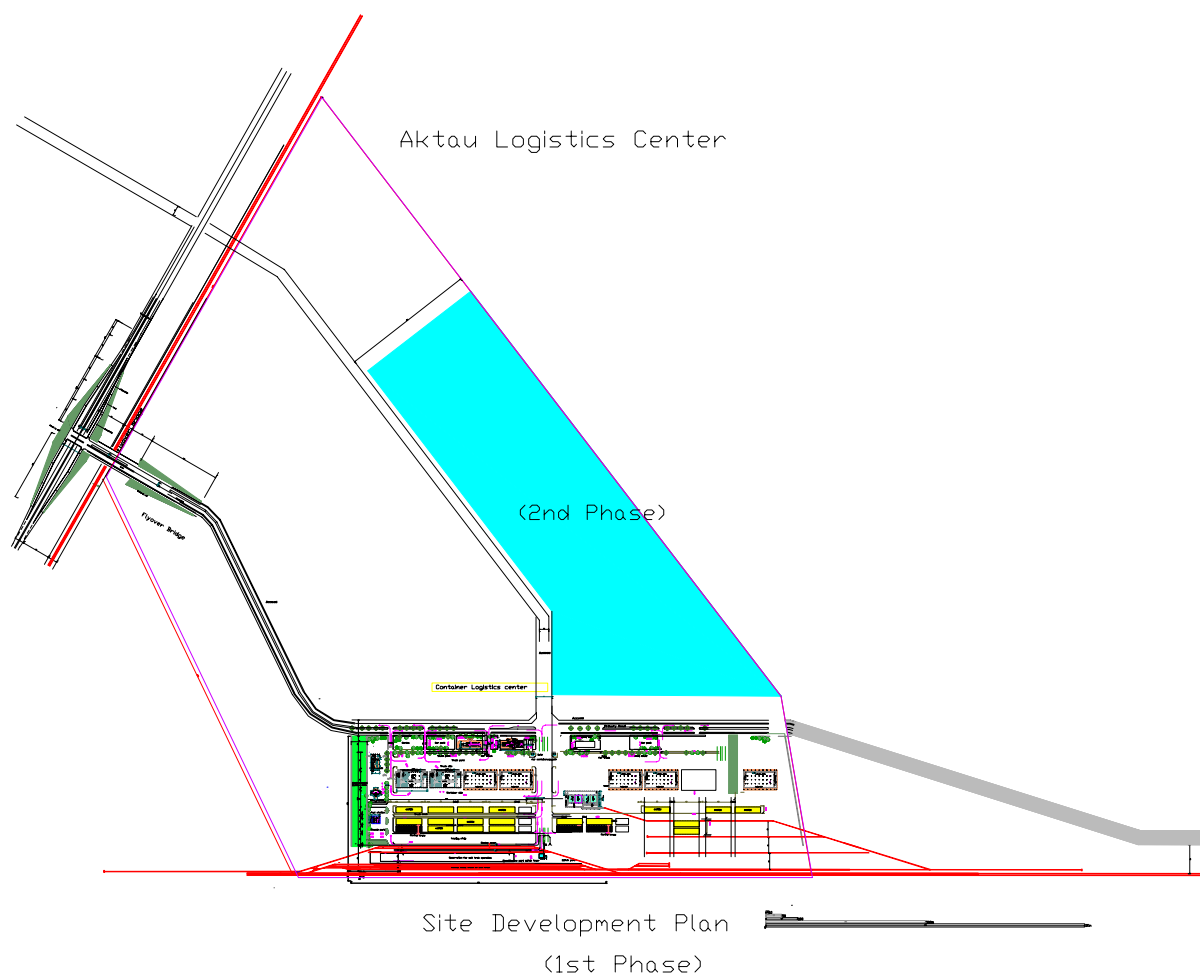
< Assets>																																
Cash	0.000	0.000	0.547	106.338	320.263	678.059	1216.980	1923.561	2827.833	4012.635	5199.270	6375.218	7552.999	8732.613	9914.061	11097.342	12174.655	13253.801	14334.781	15417.594	16502.240	17600.429	18763.005	19925.580	21088.155	22250.730	23406.305	24561.881	25717.456	26873.031	28028.606	29184.181
Fixed assets	1513.481	2094.988	1989.540	1884.091	1778.642	1673.194	1567.745	1462.296	1356.847	1251.398	1145.949	1165.700	1060.251	954.802	849.353	743.904	1716.455	1611.006	1505.557	1400.108	1294.659	1314.410	1208.961	1103.512	998.063	892.614	857.165	751.716	646.267	540.818	435.369	329.920
Assets total	1513.482	2094.989	1990.087	1990.429	2098.905	2351.252	2784.724	3385.857	4184.680	5264.032	6345.218	7540.917	8613.250	9687.415	10763.414	11841.246	13891.110	14864.807	15840.338	16817.702	17796.899	18914.839	19971.966	21029.092	22086.218	23143.344	24263.471	25313.597	26363.723	27413.849	28463.976	29514.102
< Debt Capital>																																
Balance	1135.112	1571.242	1571.242	1571.242	1571.242	1571.242	1571.242	1571.242	1508.180	1420.889	1333.598	1246.306	1159.015	1071.724	984.433	897.142	809.850	722.559	635.268	547.977	460.685	397.624	397.624	397.624	397.624	397.624	397.624	397.624	397.624	397.624	397.624	397.624
Capital	378.371	523.748	523.748	523.748	523.748	523.748	523.748	523.748	523.748	523.748	523.748	648.948	648.948	648.948	648.948	648.948	1726.948	1726.948	1726.948	1726.948	1852.148	1852.148	1852.148	1852.148	1852.148	1852.148	1922.148	1922.148	1922.148	1922.148	1922.148	1922.148
Cumulative profit surplus	0.000	0.000	-104.902	-104.560	3.916	256.263	689.735	1290.868	2152.753	3319.396	4487.873	5645.664	6805.287	7966.744	9130.034	10295.157	11354.312	12415.301	13478.123	14542.778	15609.267	16665.069	17722.195	18779.321	19836.447	20893.573	21943.700	22993.826	24043.952	25094.078	26144.205	27194.331
Amount of debt + capex	1513.483	2094.990	1990.088	1990.430	2098.906	2351.253	2784.725	3385.858	4184.681	5264.033	6345.219	7540.918	8613.250	9687.416	10763.415	11841.246	13891.111	14864.808	15840.339	16817.703	17796.900	18914.840	19971.966	21029.093	22086.219	23143.345	24263.471	25313.598	26363.724	27413.850	28463.976	29514.103

Cash Flow

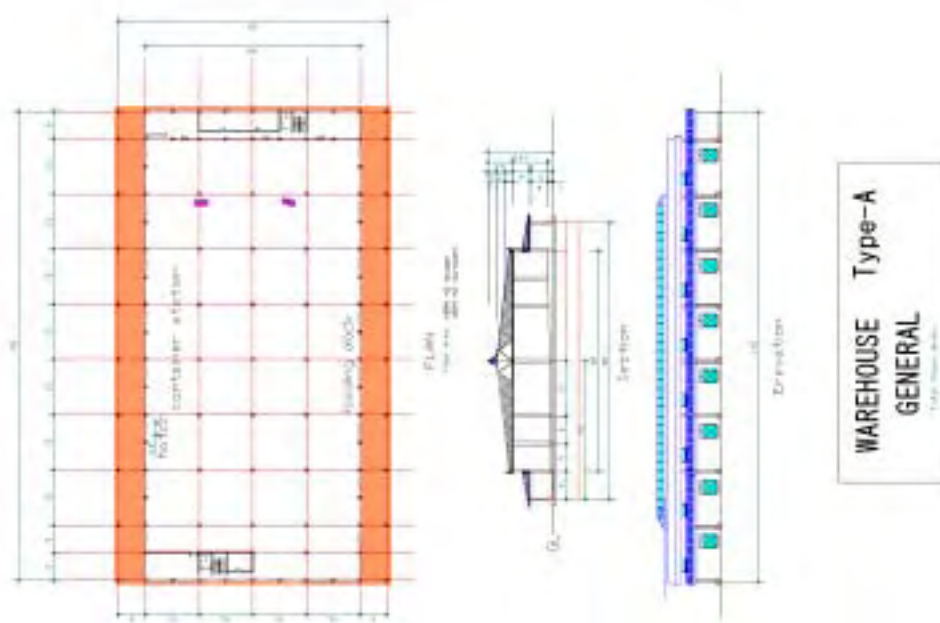
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Project IRR	23.12%
Equity IRR	43.26%

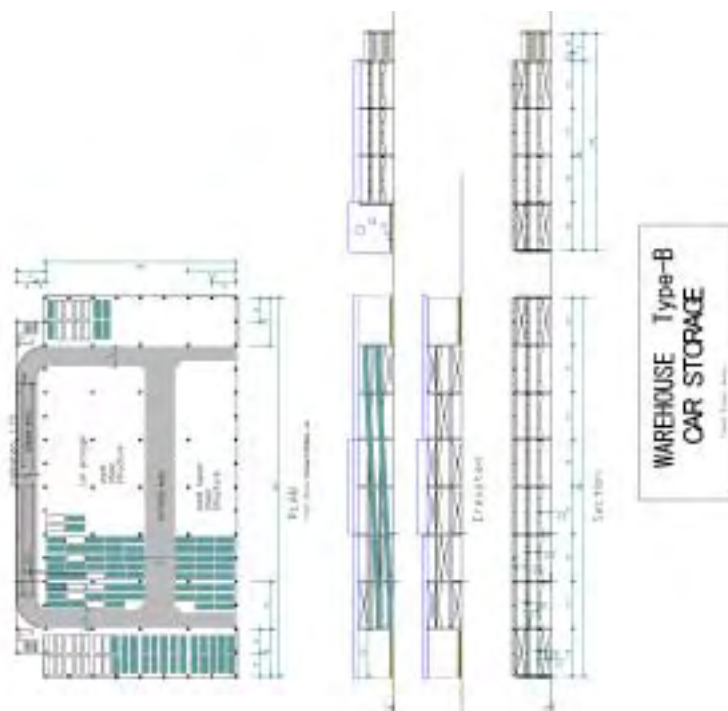
Appendix11-1 Layout Plan of Aktau Logistics Center

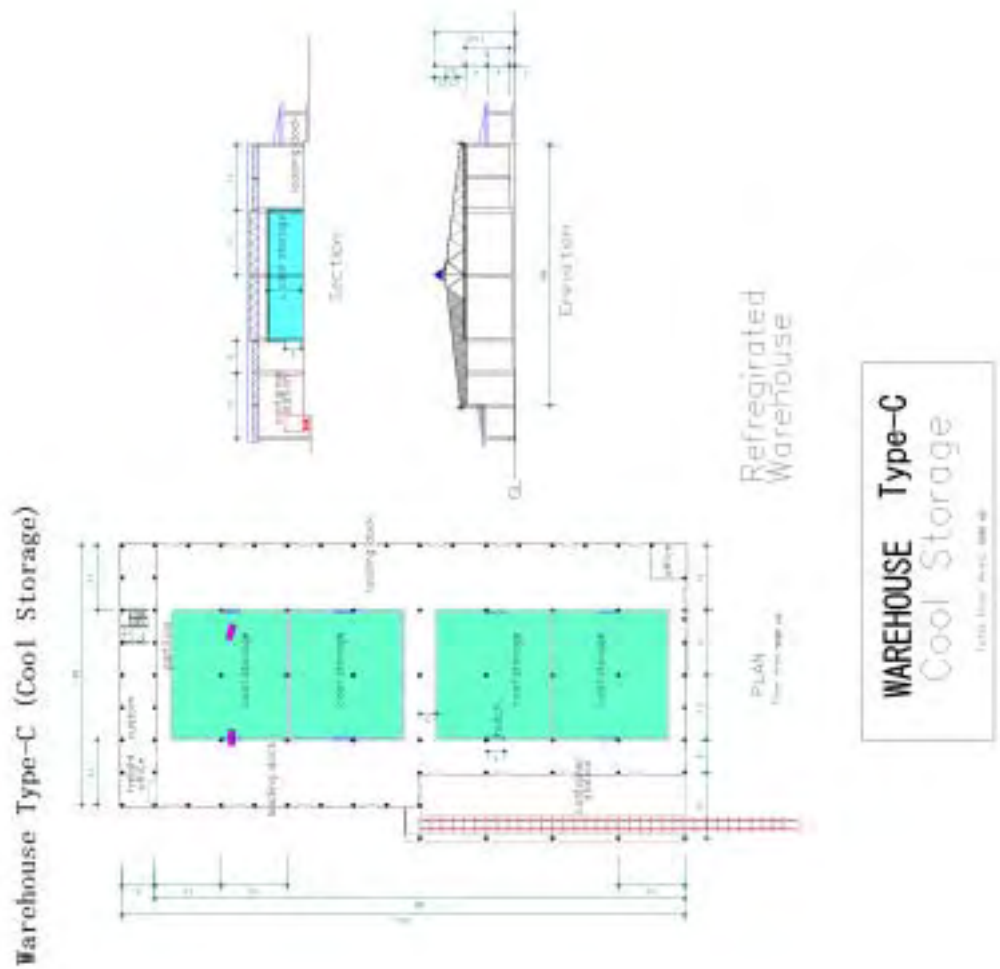


Warehouse Type-A (General and Dangerous)

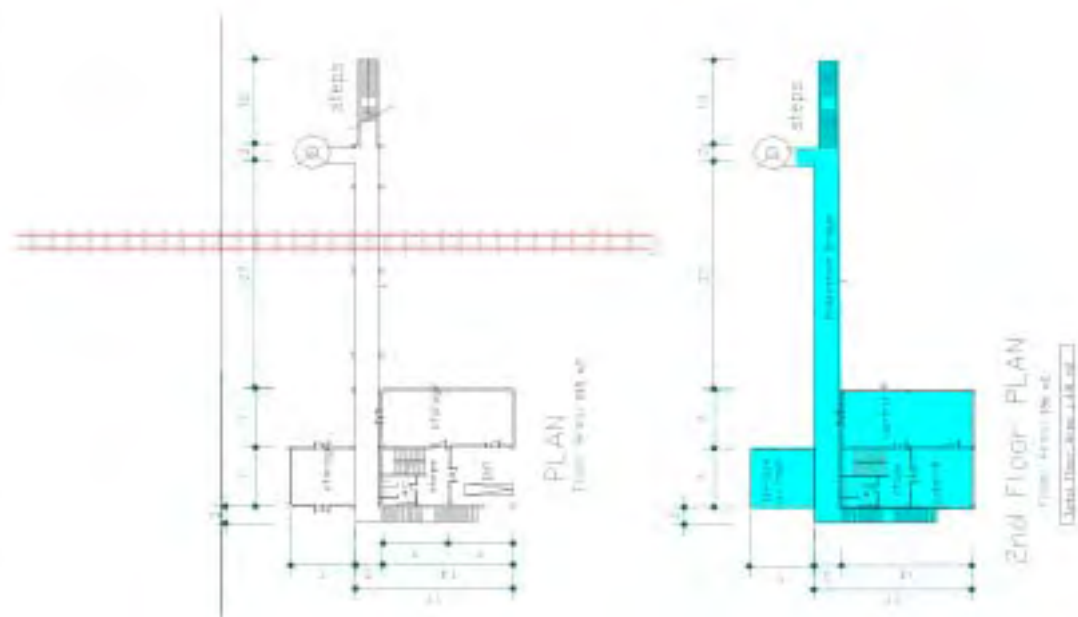


Warehouse Type-B (Car Storage)

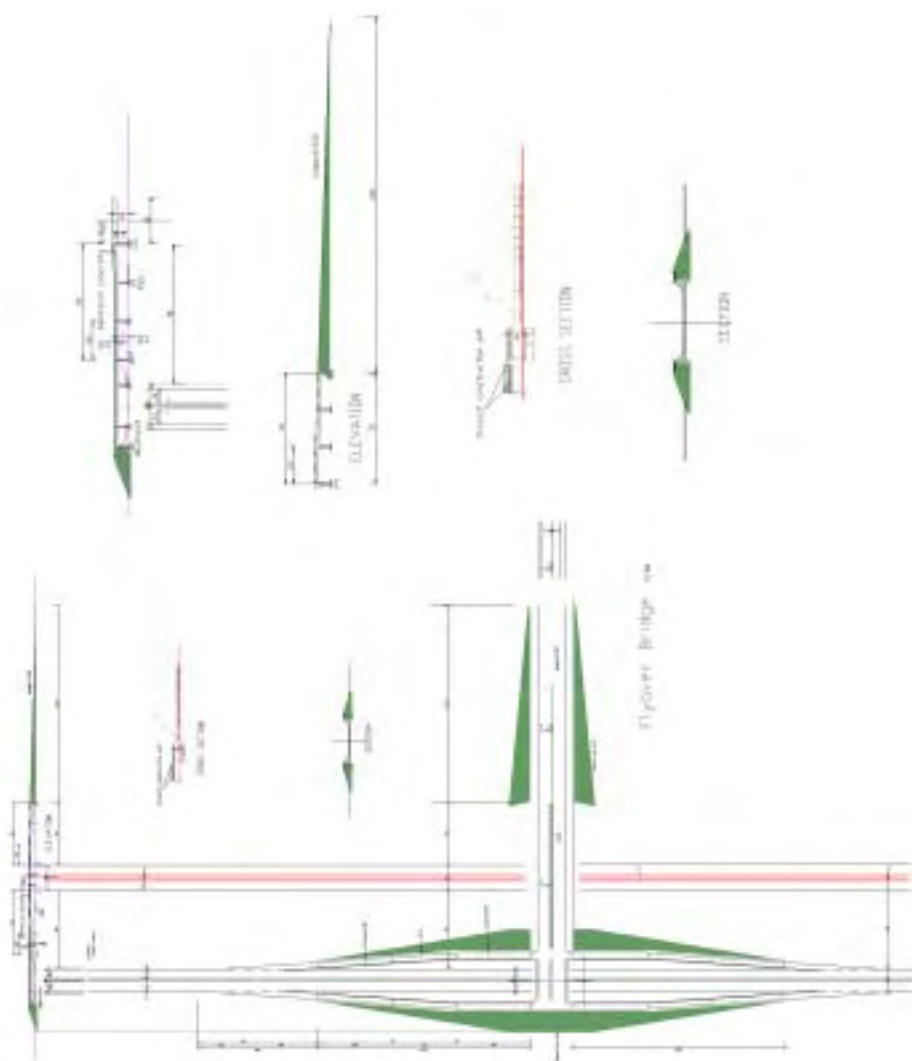




Classification yard switch tower and Pedestrian Bridge



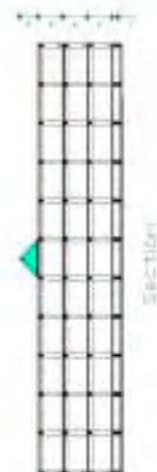
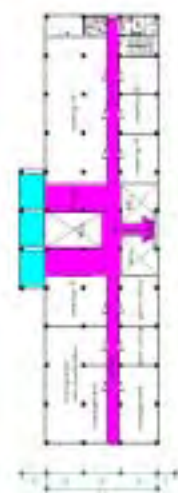
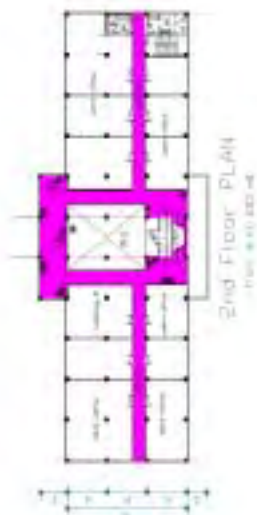
Flyover Bridge



Administration Office

Administration Office

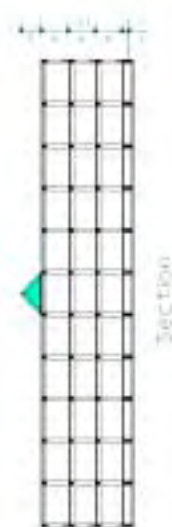
Total Floor Area: 36,000 sq. ft.



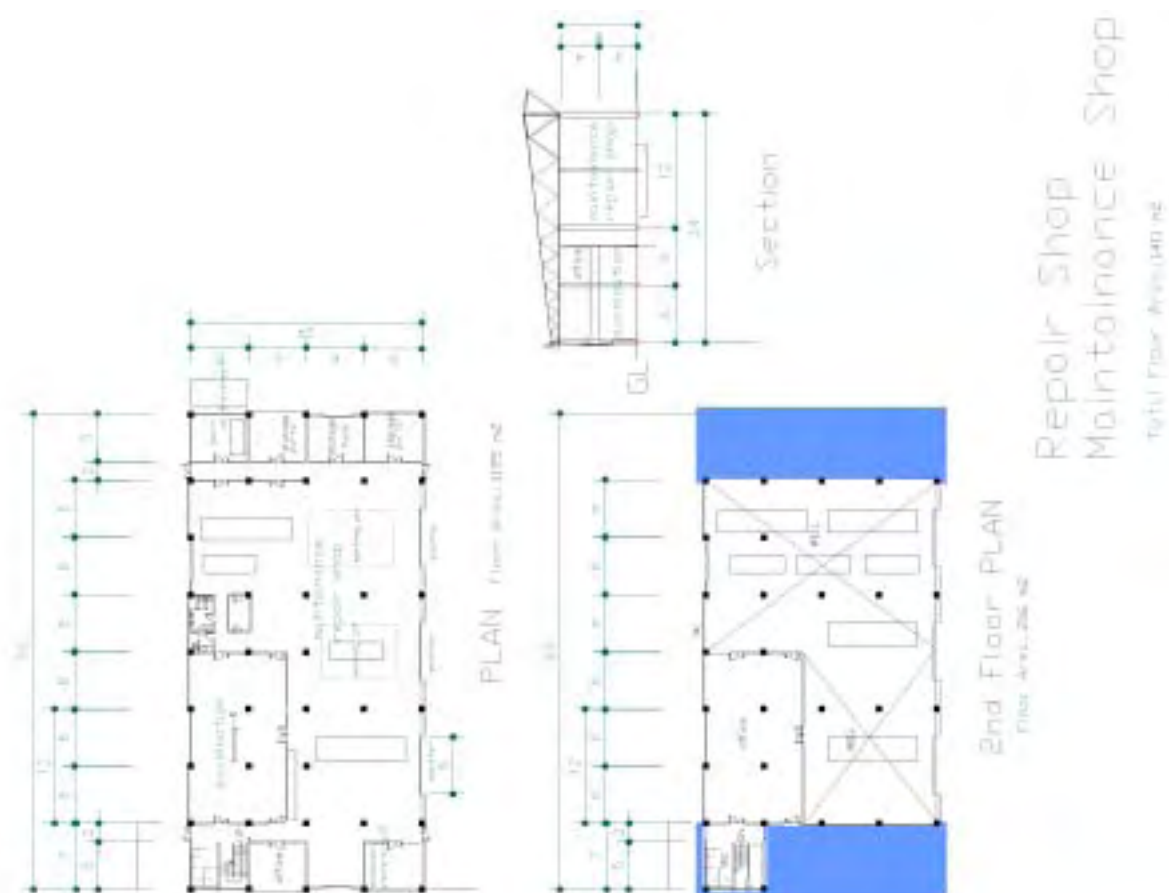
Guest House and Auction

Guest House

Total Floor Area: 30,000 sq. ft.



Repair Shop and Maintenance Shop



Appendix11-2 Detail Cost Benefit Result of Feasibility Study for Aktau Logistics Center

Discount rate = 12% Unit: million KZT

Seq. No.	Year	Investment Cost	Annual O & M Cost	Total Cost	Net Benefit	VOC Saving	Maintenance Cost Saving	Total Benefit
-2	2010	2,052.713	0.000	2,052.713	-2,052.713	0.000	0.000	0.000
-1	2011	3,622.657	0.000	3,622.657	-3,622.657	0.000	0.000	0.000
1	2012	0.000	1,094.447	1,094.447	1,410.884	2,002.875	502.456	2,505.331
2	2013	0.000	1,094.447	1,094.447	1,616.664	2,167.385	543.726	2,711.112
3	2014	0.000	1,094.447	1,094.447	1,839.347	2,345.408	588.386	2,933.795
4	2015	869.770	1,094.447	1,964.217	1,210.551	2,538.053	636.715	3,174.768
5	2016	869.770	1,094.447	1,964.217	1,471.317	2,746.522	689.013	3,435.534
6	2017	0.000	1,094.447	1,094.447	2,623.272	2,972.113	745.606	3,717.719
7	2018	0.000	1,094.447	1,094.447	2,623.272	2,972.113	745.606	3,717.719
8	2029	0.000	1,094.447	1,094.447	2,623.272	2,972.113	745.606	3,717.719
9	2020	0.000	1,094.447	1,094.447	2,623.272	2,972.113	745.606	3,717.719
10	2021	134.590	1,094.447	1,229.038	2,488.681	2,972.113	745.606	3,717.719
11	2022	0.000	1,094.447	1,094.447	2,623.272	2,972.113	745.606	3,717.719
12	2023	0.000	1,094.447	1,094.447	2,623.272	2,972.113	745.606	3,717.719
13	2024	0.000	1,094.447	1,094.447	2,623.272	2,972.113	745.606	3,717.719
14	2025	0.000	1,094.447	1,094.447	2,623.272	2,972.113	745.606	3,717.719
15	2026	725.475	1,094.447	1,819.922	1,897.797	2,972.113	745.606	3,717.719
16	2027	0.000	1,094.447	1,094.447	2,623.272	2,972.113	745.606	3,717.719
17	2028	0.000	1,094.447	1,094.447	2,623.272	2,972.113	745.606	3,717.719
18	2039	0.000	1,094.447	1,094.447	2,623.272	2,972.113	745.606	3,717.719
19	2030	0.000	1,094.447	1,094.447	2,623.272	2,972.113	745.606	3,717.719
20	2031	134.590	1,094.447	1,229.038	2,488.681	2,972.113	745.606	3,717.719
21	2032	0.000	1,094.447	1,094.447	2,623.272	2,972.113	745.606	3,717.719
22	2033	0.000	1,094.447	1,094.447	2,623.272	2,972.113	745.606	3,717.719
23	2034	0.000	1,094.447	1,094.447	2,623.272	2,972.113	745.606	3,717.719
24	2035	0.000	1,094.447	1,094.447	2,623.272	2,972.113	745.606	3,717.719
25	2036	40.113	1,094.447	1,134.560	2,583.159	2,972.113	745.606	3,717.719
26	2037	0.000	1,094.447	1,094.447	2,623.272	2,972.113	745.606	3,717.719
27	2038	0.000	1,094.447	1,094.447	2,623.272	2,972.113	745.606	3,717.719
28	2039	0.000	1,094.447	1,094.447	2,623.272	2,972.113	745.606	3,717.719
29	2040	0.000	1,094.447	1,094.447	2,623.272	2,972.113	745.606	3,717.719
30	2041	-2,377.621	1,094.447	-1,283.174	5,000.893	2,972.113	745.606	3,717.719
Total		6,072.056	32,833.421	38,905.477	68,798.038	86,103.066	21,600.449	107,703.515

B/C Ratio = 1.70 EIRR = 29.01 % NPV = 7,055.535 million KZT

Appendix11-3 Detail Financial Analysis Result of Feasibility Study for Aktau Logistics Center (Plan 1)

Unit: million KZT

Seq. No.	Year	Investment Cost	Annual O & M Cost	Total Cost	Net Revenues	Annual Revenues
-2	2010	2,360.694	0.000	2,360.694	-2,360.694	0.000
-1	2011	4,266.115	0.000	4,266.115	-4,266.115	0.000
1	2012	0.000	1,192.050	1,192.050	759.669	1,951.719
2	2013	0.000	1,192.050	1,192.050	1,066.040	2,258.090
3	2014	0.000	1,192.050	1,192.050	1,422.443	2,614.493
4	2015	991.537	1,192.050	2,183.587	845.896	3,029.483
5	2016	991.537	1,192.050	2,183.587	1,329.604	3,513.191
6	2017	0.000	1,192.050	1,192.050	2,321.141	3,513.191
7	2018	0.000	1,192.050	1,192.050	2,321.141	3,513.191
8	2019	0.000	1,192.050	1,192.050	2,321.141	3,513.191
9	2020	0.000	1,192.050	1,192.050	2,321.141	3,513.191
10	2021	174.760	1,192.050	1,366.810	2,146.381	3,513.191
11	2022	0.000	1,192.050	1,192.050	2,321.141	3,513.191
12	2023	0.000	1,192.050	1,192.050	2,321.141	3,513.191
13	2024	0.000	1,192.050	1,192.050	2,321.141	3,513.191
14	2025	0.000	1,192.050	1,192.050	2,321.141	3,513.191
15	2026	942.000	1,192.050	2,134.050	1,379.141	3,513.191
16	2027	0.000	1,192.050	1,192.050	2,321.141	3,513.191
17	2028	0.000	1,192.050	1,192.050	2,321.141	3,513.191
18	2029	0.000	1,192.050	1,192.050	2,321.141	3,513.191
19	2030	0.000	1,192.050	1,192.050	2,321.141	3,513.191
20	2031	174.760	1,192.050	1,366.810	2,146.381	3,513.191
21	2032	0.000	1,192.050	1,192.050	2,321.141	3,513.191
22	2033	0.000	1,192.050	1,192.050	2,321.141	3,513.191
23	2034	0.000	1,192.050	1,192.050	2,321.141	3,513.191
24	2035	0.000	1,192.050	1,192.050	2,321.141	3,513.191
25	2036	50.000	1,192.050	1,242.050	2,271.141	3,513.191
26	2037	0.000	1,192.050	1,192.050	2,321.141	3,513.191
27	2038	0.000	1,192.050	1,192.050	2,321.141	3,513.191
28	2039	0.000	1,192.050	1,192.050	2,321.141	3,513.191
29	2040	0.000	1,192.050	1,192.050	2,321.141	3,513.191
30	2041	-2,719.348	1,192.050	-1,527.298	5,040.490	3,513.191
Total		7,232.055	35,761.500	42,993.555	58,203.203	101,196.757

Project FIRR = 21.21 % NPV at 7.95% int. = 10,529.965 million KZT

Appendix11-3 Detail Financial Analysis Result of Feasibility Study for Aktau Logistics Center (Plan 2)

Unit: million KZT

Seq. No.	Year	Investment Cost	Annual O & M Cost	Total Cost	Net Revenues	Annual Revenues
-2	2010	2,360.694	0.000	2,360.694	-2,360.694	0.000
-1	2011	4,266.115	0.000	4,266.115	-4,266.115	0.000
1	2012	0.000	1,192.050	1,192.050	759.669	1,951.719
2	2013	0.000	1,192.050	1,192.050	1,066.040	2,258.090
3	2014	0.000	1,192.050	1,192.050	1,422.443	2,614.493
4	2015	991.537	1,192.050	2,183.587	845.896	3,029.483
5	2016	991.537	1,192.050	2,183.587	1,329.604	3,513.191
6	2017	0.000	1,192.050	1,192.050	2,321.141	3,513.191
7	2018	0.000	1,192.050	1,192.050	2,321.141	3,513.191
8	2019	0.000	1,192.050	1,192.050	2,321.141	3,513.191
9	2020	0.000	1,192.050	1,192.050	2,321.141	3,513.191
10	2021	174.760	1,192.050	1,366.810	2,146.381	3,513.191
11	2022	0.000	1,192.050	1,192.050	2,321.141	3,513.191
12	2023	0.000	1,192.050	1,192.050	2,321.141	3,513.191
13	2024	0.000	1,192.050	1,192.050	2,321.141	3,513.191
14	2025	0.000	1,192.050	1,192.050	2,321.141	3,513.191
15	2026	942.000	1,192.050	2,134.050	1,379.141	3,513.191
16	2027	0.000	1,192.050	1,192.050	2,321.141	3,513.191
17	2028	0.000	1,192.050	1,192.050	2,321.141	3,513.191
18	2029	0.000	1,192.050	1,192.050	2,321.141	3,513.191
19	2030	0.000	1,192.050	1,192.050	2,321.141	3,513.191
20	2031	174.760	1,192.050	1,366.810	2,146.381	3,513.191
21	2032	0.000	1,192.050	1,192.050	2,321.141	3,513.191
22	2033	0.000	1,192.050	1,192.050	2,321.141	3,513.191
23	2034	0.000	1,192.050	1,192.050	2,321.141	3,513.191
24	2035	0.000	1,192.050	1,192.050	2,321.141	3,513.191
25	2036	50.000	1,192.050	1,242.050	2,271.141	3,513.191
26	2037	0.000	1,192.050	1,192.050	2,321.141	3,513.191
27	2038	0.000	1,192.050	1,192.050	2,321.141	3,513.191
28	2039	0.000	1,192.050	1,192.050	2,321.141	3,513.191
29	2040	0.000	1,192.050	1,192.050	2,321.141	3,513.191
30	2041	-2,719.348	1,192.050	-1,527.298	5,040.490	3,513.191
Total		7,232.055	35,761.500	42,993.555	58,203.203	101,196.757

Project FIRR = 21.21 % NPV at 4.69% int. = 10,529.965 million KZT

Appendix11-3 Detail Financial Analysis Result of Feasibility Study for Aktau Logistics Center (Plan 3)

Unit: million KZT

Seq. No.	Year	Investment Cost	Annual O & M Cost	Total Cost	Net Revenues	Annual Revenues
-2	2010	2,360.694	0.000	2,360.694	-2,360.694	0.000
-1	2011	4,266.115	0.000	4,266.115	-4,266.115	0.000
1	2012	0.000	1,192.050	1,192.050	759.669	1,951.719
2	2013	0.000	1,192.050	1,192.050	1,066.040	2,258.090
3	2014	0.000	1,192.050	1,192.050	1,422.443	2,614.493
4	2015	991.537	1,192.050	2,183.587	845.896	3,029.483
5	2016	991.537	1,192.050	2,183.587	1,329.604	3,513.191
6	2017	0.000	1,192.050	1,192.050	2,321.141	3,513.191
7	2018	0.000	1,192.050	1,192.050	2,321.141	3,513.191
8	2019	0.000	1,192.050	1,192.050	2,321.141	3,513.191
9	2020	0.000	1,192.050	1,192.050	2,321.141	3,513.191
10	2021	174.760	1,192.050	1,366.810	2,146.381	3,513.191
11	2022	0.000	1,192.050	1,192.050	2,321.141	3,513.191
12	2023	0.000	1,192.050	1,192.050	2,321.141	3,513.191
13	2024	0.000	1,192.050	1,192.050	2,321.141	3,513.191
14	2025	0.000	1,192.050	1,192.050	2,321.141	3,513.191
15	2026	942.000	1,192.050	2,134.050	1,379.141	3,513.191
16	2027	0.000	1,192.050	1,192.050	2,321.141	3,513.191
17	2028	0.000	1,192.050	1,192.050	2,321.141	3,513.191
18	2029	0.000	1,192.050	1,192.050	2,321.141	3,513.191
19	2030	0.000	1,192.050	1,192.050	2,321.141	3,513.191
20	2031	174.760	1,192.050	1,366.810	2,146.381	3,513.191
21	2032	0.000	1,192.050	1,192.050	2,321.141	3,513.191
22	2033	0.000	1,192.050	1,192.050	2,321.141	3,513.191
23	2034	0.000	1,192.050	1,192.050	2,321.141	3,513.191
24	2035	0.000	1,192.050	1,192.050	2,321.141	3,513.191
25	2036	50.000	1,192.050	1,242.050	2,271.141	3,513.191
26	2037	0.000	1,192.050	1,192.050	2,321.141	3,513.191
27	2038	0.000	1,192.050	1,192.050	2,321.141	3,513.191
28	2039	0.000	1,192.050	1,192.050	2,321.141	3,513.191
29	2040	0.000	1,192.050	1,192.050	2,321.141	3,513.191
30	2041	-2,719.348	1,192.050	-1,527.298	5,040.490	3,513.191
Total		7,232.055	35,761.500	42,993.555	58,203.203	101,196.757

Project FIRR = 21.21 % NPV at 2.81% int. = 10,529.965 million KZT

Appendix11-4 Financial Statements (Plan1 for Aktau Logistics Center)

Unit: million KZT

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Annual	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

Profit & Loss Statement

Revenue					1951.719	2258.090	2614.493	3029.483	3513.191	3513.191	3513.191	3513.191	3513.191	3513.191	3513.191	3513.191	3513.191	3513.191	3513.191	3513.191	3513.191	3513.191	3513.191	3513.191	3513.191	3513.191	3513.191	3513.191	3513.191	3513.191	3513.191	3513.191	
Expense					1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	1192.050	
Depreciation					203.611	203.610	203.610	203.610	225.644	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	
Interest					904.560	814.103	723.648	633.191	678.081	709.434	591.910	474.384	356.860	239.334	121.810	94.741	67.672	40.603	13.534	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Profits before tax					-348.502	48.326	495.185	1000.632	1417.416	1364.028	1481.552	1599.078	1716.602	1834.128	1951.652	1978.721	2005.790	2032.859	2059.928	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	
Corporate tax					0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Profits after tax					-348.502	48.326	495.185	1000.632	1417.416	1364.028	1481.552	1599.078	1716.602	1834.128	1951.652	1978.721	2005.790	2032.859	2059.928	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	
Dividend										-363.978	-363.978	-363.978	-363.978	-381.454	-381.454	-381.454	-381.454	-381.454	-475.654	-475.654	-475.654	-475.654	-475.654	-493.130	-493.130	-493.130	-493.130	-493.130	-498.130	-498.130	-498.130	-498.130	
Benefits					-348.502	48.326	495.185	1000.632	1417.416		1000.050	1117.574	1235.100	1352.624	1452.674	1570.198	1597.267	1624.336	1651.405	1584.274	1597.808	1597.808	1597.808	1597.808	1580.332	1580.332	1580.332	1580.332	1575.332	1575.332	1575.332	1575.332	
Amount of benefit					-348.502	-300.176	195.009	1195.641	2613.057	3613.107	4730.682	5965.782	7318.406	8771.081	10341.279	11938.546	13562.882	15214.288	16798.562	18396.370	19994.179	21591.987	23189.795	24770.128	26350.460	27930.792	29511.124	31091.457	32666.789	34242.121	35817.454	37392.786	38968.118

Balance Sheet

< Assets>																																
Cash	0.001	0.001	-641.901	-886.975	-685.190	765.694	2581.031	3183.019	3902.531	4739.569	5694.130	6748.742	8417.889	10114.104	11837.388	13587.742	15345.330	17190.817	19036.304	20881.791	22727.278	24555.289	26383.300	28211.311	30039.322	31867.333	33690.344	35513.355	37336.366	39159.377	40982.388	42805.399
Fixed assets	2360.694	6626.809	6423.198	6219.588	6015.977	6803.904	7569.797	7322.118	7074.439	6826.761	6579.082	6506.163	6258.484	6010.806	5763.127	5515.448	6209.769	5962.091	5714.412	5466.733	5219.055	5146.136	4898.457	4650.778	4403.100	4155.421	3957.742	3710.063	3462.385	3214.706	2967.027	2719.348
Assets total	2360.695	6626.810	5781.297	5332.613	5330.787	7569.598	10150.828	10505.137	10976.970	11566.329	12273.212	13254.905	14676.373	16124.910	17600.515	19103.190	21555.099	23152.907	24750.716	26348.524	27946.332	29701.425	31281.757	32862.089	34442.421	36022.754	37648.086	39223.418	40798.751	42374.083	43949.415	45524.748
< Debt Capital>																																
Balance	1770.521	4970.107	4473.096	3976.086	3479.075	3725.717	3897.994	3252.253	2606.512	1960.770	1315.029	669.288	520.557	371.827	223.096	74.365	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Capital	590.174	1656.703	1656.703	1656.703	1656.703	2648.240	3639.777	3639.777	3639.777	3639.777	3639.777	3814.537	3814.537	3814.537	3814.537	3814.537	4756.537	4756.537	4756.537	4756.537	4756.537	4931.297	4931.297	4931.297	4931.297	4931.297	4981.297	4981.297	4981.297	4981.297	4981.297	4981.297
Cumulative profit surplus	0.000	0.000	-348.502	-300.176	195.009	1195.641	2613.057	3613.107	4730.682	5965.782	7318.406	8771.081	10341.279	11938.546	13562.882	15214.288	16798.562	18396.370	19994.179	21591.987	23189.795	24770.128	26350.460	27930.792	29511.124	31091.457	32666.789	34242.121	35817.454	37392.786	38968.118	40543.451
Amount of debt + capex	2360.695	6626.810	5781.297	5332.613	5330.787	7569.598	10150.828	10505.137	10976.970	11566.329	12273.212	13254.905	14676.373	16124.910	17600.515	19103.190	21555.099	23152.907	24750.716	26348.524	27946.332	29701.425	31281.757	32862.089	34442.421	36022.754	37648.086	39223.418	40798.751	42374.083	43949.415	45524.748

Cash Flow

Profits after tax	0.000	0.000	-348.502	48.326	495.185	1000.632	1417.416	1364.028	1481.552	1599.078	1716.602	1834.128	1951.652	1978.721	2005.790	2032.859	2059.928	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462	2073.462
Depreciation	0.000	0.000	203.611	203.610	203.610	203.610	225.644	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679
Interest	0.000	0.000	904.560	814.103	723.648	633.191	678.081	709.434	591.910	474.384	356.860	239.334	121.810	94.741	67.672	40.603	13.534	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Investment cost	-2360.694	-4266.115	0.000	0.000	0.000	-991.537	-991.537	0.000	0.000	0.000	0.000	-174.760	0.000	0.000	0.000	0.000	-942.000	0.000	0.000	0.000	0.000	-174.760	0.000	0.000	0.000	0.000	0.000	-50.000	0.000	0.000	0.000	0.000
PROJECT Cashflow	-2360.694	-4266.115	759.669	1066.039	1422.443	845.896	1329.604	2321.141	2321.141	2321.141	2321.141	2146.381	2321.141	2321.141	2321.141	2321.141	1379.141	2321.141	2321.141	2321.141	2321.141	2146.381	2321.141	2321.141	2321.141	2321.141	2271.141	2321.141	2321.141	2321.141	2321.141	2321.141
PROJECT IRR						-14.85%	-5.46%	3.67%	8.90%	12.27%	14.57%	16.10%	17.30%	18.20%	18.88%	19.40%	19.64%	19.97%	20.22%	20.42%	20.59%	20.71%	20.81%	20.89%	20.96%	21.02%	21.06%	21.10%	21.13%	21.15%	21.17%	21.21%
Interest	0.000	0.000	-904.560	-814.103	-723.648	-633.191	-678.081	-709.434	-591.910	-474.384	-356.860	-239.334	-121.810	-94.741	-67.672	-40.603	-13.534	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(Domestic loans)	0.000	0.000	-904.560	-814.103	-723.648	-633.191	-678.081	-709.434	-591.910	-474.384	-356.860	-239.334	-121.810	-94.741	-67.672	-40.603	-13.534	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(Foreign loans)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(ODA loans)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Debt-repay.	1770.521	3199.586	-497.011	-497.011	-497.011	246.642	172.277	-645.741	-645.741	-645.741	-645.741	-645.741	-148.731	-148.731	-148.731	-148.731	-74.365	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(Domestic loans)	1770.521	3199.586	-497.011	-497.011	-497.011	246.642	172.277	-645.741	-645.741	-645.741	-645.741	-645.741	-148.731	-148.731	-148.731	-148.731	-74.365	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(Foreign loans)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(ODA loans)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Balance	1770.521	4970.107	4473.096	3976.086	3479.075	3725.717	3897.994	3252.253	2606.512	1960.770	1315.029	669.288	520.557	371.827	223.096	74.365	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(Domestic loans)	1770.521	4970.107	4473.096	3976.086	3479.075	3725.717	3897.994	3252.253	2606.512	1960.770	1315.029	669.288	520.557	371.827	223.096	74.365	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(Foreign loans)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(ODA loans)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EQUITY Cashflow	-590.173	-1,066.529	-641.902	-245.074	201.785	459.347	823.800	965.965	1,083.489	1,201.015	1,318.539	1,261.305	2,050.600	2,077.669	2,104.738	2,131.807	1,291.241	2,321.141	2,321.141	2,321.141	2,321.141	2,146.381	2,321.141	2,321.141	2,321.141	2,321.141	2,271.141	2,321.141	2,321.141	2,321.141	2,321.141	2,321.141
EQUITY IRR							-12.07%	-0.77%	6.27%	11.00%	14.32%	16.46%	18.81%	20.40%	21.53%	22.35%	22.72%	23.22%	23.60%	23.89%	24.11%	24.27%	24.40%	24.50%	24.58%	24.65%	24.70%	24.74%	24.77%	24.79%	24.81%	24.83%

Appendix11-4 Financial Statements (Plan2 for Aktau Logistics Center)

Unit: million KZT

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Annual	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

Profit & Loss Statement

[illegible]

Balance Sheet

< Assets>																																
Cash	0.001	0.001	-11.194	311.368	1017.718	2910.096	5198.228	6294.870	7427.093	8594.896	9798.279	11019.766	12773.844	14536.118	16306.586	18085.249	19852.273	21697.760	23543.247	25388.734	27234.221	29062.233	30890.244	32718.255	34546.266	36374.277	38197.288	40020.299	41843.310	43666.321	45489.332	47312.343
Fixed assets	2360.694	6626.809	6423.198	6219.588	6015.977	6803.904	7569.797	7322.118	7074.439	6826.761	6579.082	6506.163	6258.484	6010.806	5763.127	5515.448	6209.769	5962.091	5714.412	5466.733	5219.055	5146.136	4898.457	4650.778	4403.100	4155.421	3957.742	3710.063	3462.385	3214.706	2967.027	2719.348
Assets total	2360.695	6626.810	6412.004	6530.956	7033.695	9714.000	12768.025	13616.988	14501.532	15421.656	16377.361	17525.929	19032.329	20546.923	22069.713	23600.698	26062.043	27659.851	29257.659	30855.468	32453.276	34208.368	35788.701	37369.033	38949.365	40529.698	42155.030	43730.362	45305.694	46881.027	48456.359	50031.691
< Debt Capital>																																
Balance	1770.521	4970.107	4473.096	3976.086	3479.075	3725.717	3897.994	3252.253	2606.512	1960.770	1315.029	669.288	520.557	371.826	223.096	74.365	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Capital	590.174	1656.703	1656.703	1656.703	1656.703	2648.240	3639.777	3639.777	3639.777	3639.777	3639.777	3814.537	3814.537	3814.537	3814.537	4756.537	4756.537	4756.537	4756.537	4756.537	4931.297	4931.297	4931.297	4931.297	4931.297	4981.297	4981.297	4981.297	4981.297	4981.297	4981.297	
Cumulative profit surplus	0.000	0.000	282.205	898.167	1897.917	3340.043	5230.254	6724.958	8255.244	9821.109	11422.555	13042.105	14697.235	16360.560	18032.080	19711.796	21305.506	22903.314	24501.123	26098.931	27696.739	29277.072	30857.404	32437.736	34018.068	35598.401	37173.733	38749.065	40324.398	41899.730	43475.062	45050.395
Amount of debt + capex	2360.695	6626.810	6412.004	6530.956	7033.695	9714.000	12768.025	13616.988	14501.532	15421.656	16377.362	17525.930	19032.329	20546.923	22069.713	23600.698	26062.043	27659.851	29257.660	30855.468	32453.276	34208.369	35788.701	37369.033	38949.365	40529.698	42155.030	43730.362	45305.695	46881.027	48456.359	50031.692

Cash Flow

[illegible]

Project IRR	21.21%
Equity IRR	36.95%

Appendix11-4 Financial Statements (Plan3 for Aktau Logistics Center)

Unit: million KZT

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Annual	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

Profit & Loss Statement

[illegible]

Balance Sheet

< Assets>																																
Cash	0.001	0.001	610.566	1527.501	2800.841	5232.823	8148.513	9956.572	11666.269	13201.162	14744.339	16278.324	17820.592	19307.520	20740.348	22183.937	23544.088	24915.003	26296.680	27689.120	29092.322	30666.565	32344.599	34025.113	35749.420	37516.280	39278.140	41040.000	42801.861	44563.721	46325.581	48087.441
Fixed assets	2360.694	6626.809	6423.198	6219.588	6015.977	6803.904	7569.797	7322.118	7074.439	6826.761	6579.082	6506.163	6258.484	6010.806	5763.127	5515.448	6209.769	5962.091	5714.412	5466.733	5219.055	5146.136	4898.457	4650.778	4403.100	4155.421	3957.742	3710.063	3462.385	3214.706	2967.027	2719.348
Assets total	2360.695	6626.810	7033.764	7747.089	8816.818	12036.727	15718.310	17278.690	18740.708	20027.923	21323.421	22784.487	24079.076	25318.325	26503.475	27699.385	29753.858	30877.094	32011.092	33155.853	34311.376	35812.700	37243.057	38675.892	40152.520	41671.701	43235.883	44750.064	46264.245	47778.426	49292.608	50806.789
< Debt Capital>																																
Balance	1770.521	4970.107	4970.107	4970.107	4970.107	5713.760	6457.413	6457.413	6359.051	6082.934	5806.816	5530.699	5254.582	4937.151	4578.406	4219.661	3860.915	3502.170	3143.425	2784.680	2425.935	2244.944	2162.316	2079.688	2038.374	2038.374	2038.374	2038.374	2038.374	2038.374	2038.374	
Capital	590.174	1656.703	1656.703	1656.703	1656.703	2648.240	3639.777	3639.777	3639.777	3639.777	3639.777	3814.537	3814.537	3814.537	3814.537	3814.537	3860.915	3502.170	3143.425	2784.680	2425.935	2244.944	2162.316	2079.688	2038.374	2038.374	2038.374	2038.374	2038.374	2038.374	2038.374	
Cumulative profit surplus	0.000	0.000	406.954	1120.279	2190.008	3674.727	5621.120	7181.500	8741.881	10305.212	11876.827	13439.251	15009.957	16566.637	18110.531	19665.187	21136.405	22618.386	24111.130	25614.636	27128.904	28636.459	30149.443	31664.906	33182.848	34702.030	36216.211	37730.392	39244.574	40758.755	42272.936	43787.118
Amount of debt + capex	2360.695	6626.810	7033.764	7747.089	8816.818	12036.727	15718.310	17278.690	18740.708	20027.923	21323.420	22784.487	24079.076	25318.325	26503.474	27699.384	29753.857	30877.094	32011.092	33155.853	34311.376	35812.700	37243.056	38675.891	40152.519	41671.701	43235.882	44750.063	46264.245	47778.426	49292.607	50806.788

Cash Flow

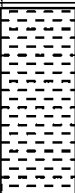
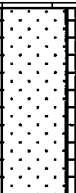
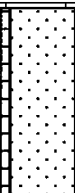
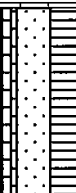
Profits after tax	0.000	0.000	406.954	713.325	1069.729	1484.719	1946.393	1924.358	1924.358	1927.309	1935.593	1943.877	1952.160	1938.134	1925.348	1936.109	1946.872	1957.635	1968.397	1979.160	1989.922	2000.684	2006.114	2008.593	2011.072	2012.311	2012.311	2012.311	2012.311	2012.311	2012.311	2012.311	
Depreciation	0.000	0.000	203.611	203.610	203.610	203.610	225.644	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	247.679	
Interest	0.000	0.000	149.104	149.104	149.104	149.104	149.104	149.104	149.104	146.153	137.869	129.585	121.302	135.328	148.114	137.353	126.590	115.827	105.065	94.302	83.540	72.778	67.348	64.869	62.390	61.151	61.151	61.151	61.151	61.151	61.151	61.151	
Investment cost	-2360.694	-4266.115	0.000	0.000	0.000	-991.537	-991.537	0.000	0.000	0.000	0.000	-174.760	0.000	0.000	0.000	0.000	-942.000	0.000	0.000	0.000	0.000	-174.760	0.000	0.000	0.000	0.000	-50.000	0.000	0.000	0.000	0.000	0.000	
PROJECT Cashflow	-2360.694	-4266.115	759.669	1066.039	1422.443	845.896	1329.604	2321.141	2321.141	2321.141	2321.141	2146.381	2321.141	2321.141	2321.141	2321.141	1379.141	2321.141	2321.141	2321.141	2321.141	2146.381	2321.141	2321.141	2321.141	2321.141	2271.141	2321.141	2321.141	2321.141	2321.141	2321.141	
PROJECT IRR						-14.85%	-5.46%	3.67%	8.90%	12.27%	14.57%	16.10%	17.30%	18.20%	18.88%	19.40%	19.64%	19.97%	20.22%	20.42%	20.59%	20.71%	20.81%	20.89%	20.96%	21.02%	21.06%	21.10%	21.13%	21.15%	21.17%	21.21%	
Interest	0.000	0.000	-149.104	-149.104	-149.104	-149.104	-149.104	-149.104	-149.104	-146.153	-137.869	-129.585	-121.302	-135.328	-148.114	-137.353	-126.590	-115.827	-105.065	-94.302	-83.540	-72.778	-67.348	-64.869	-62.390	-61.151	-61.151	-61.151	-61.151	-61.151	-61.151	-61.151	
(Domestic loans)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
(Foreign loans)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
(ODA loans)	0.000	0.000	-149.104	-149.104	-149.104	-149.104	-149.104	-149.104	-149.104	-146.153	-137.869	-129.585	-121.302	-135.328	-148.114	-137.353	-126.590	-115.827	-105.065	-94.302	-83.540	-72.778	-67.348	-64.869	-62.390	-61.151	-61.151	-61.151	-61.151	-61.151	-61.151	-61.151	
Debt-repay.	1770.521	3199.586	0.000	0.000	0.000	743.653	743.653	0.000	-98.362	-276.117	-276.117	-276.117	-276.117	-317.431	-358.745	-358.745	-358.745	-358.745	-358.745	-358.745	-358.745	-180.990	-82.628	-82.628	-41.314	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
(Domestic loans)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
(Foreign loans)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
(ODA loans)	1770.521	3199.586	0.000	0.000	0.000	743.653	743.653	0.000	-98.362	-276.117	-276.117	-276.117	-276.117	-317.431	-358.745	-358.745	-358.745	-358.745	-358.745	-358.745	-358.745	-180.990	-82.628	-82.628	-41.314	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Balance	1770.521	4970.107	4970.107	4970.107	4970.107	5713.760	6457.413	6457.413	6359.051	6082.934	5806.816	5530.699	5254.582	4937.151	4578.406	4219.661	3860.915	3502.170	3143.425	2784.680	2425.935	2244.944	2162.316	2079.688	2038.374	2038.374	2038.374	2038.374	2038.374	2038.374	2038.374	2038.374	
(Domestic loans)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
(Foreign loans)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
(ODA loans)	1770.521	4970.107	4970.107	4970.107	4970.107	5713.760	6457.413	6457.413	6359.051	6082.934	5806.816	5530.699	5254.582	4937.151	4578.406	4219.661	3860.915	3502.170	3143.425	2784.680	2425.935	2244.944	2162.316	2079.688	2038.374	2038.374	2038.374	2038.374	2038.374	2038.374	2038.374	2038.374	
EQUITY Cashflow	-590.173	-1,066.529	610.565	916.935	1,273.339	1,440.445	1,924.153	2,172.037	2,073.674	1,898.871	1,907.155	1,740.679	1,923.722	1,868.382	1,814.282	1,825.043	893.806	1,846.569	1,857.331	1,868.094	1,878.856	1,892.612	2,171.165	2,173.644	2,217.437	2,259.990	2,209.990	2,259.990	2,259.990	2,259.990	2,259.990	2,259.990	
EQUITY IRR				-4.06%	22.84%	36.07%	44.50%	49.31%	51.82%	53.15%	53.95%	54.40%	54.71%	54.90%	55.02%	55.09%	55.12%	55.15%	55.17%	55.18%	55.19%	55.19%	55.20%	55.20%	55.20%	55.20%	55.20%	55.20%	55.20%	55.20%	55.20%	55.20%	

Project IRR	21.21%
Equity IRR	55.20%

Appendix 11-5 Geological Profile of Aktau Logistics Center

Скважина №1
Дата проходки: 11.06.2007г.
Абсолютная отметка скважины 287,53

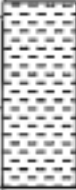
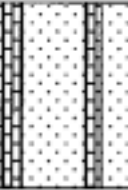
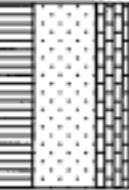
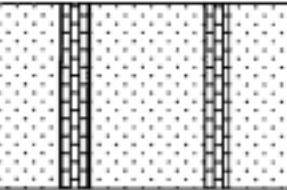
№ ИГЭ	Глубина залегания ИГЭ, м.	Мощность ИГЭ, м.	Абсолютная отметка м.	Геологический возраст	Литологический разрез	Отбор проб	Описание грунтов	УГВ Появл.м Устан. м
1	0,0 - 0,9	0,9	286,63				Супесь твердая, просадочная	5,7
3	0,9 - 2,8	1,7	284,73				Песок пылеватый, от малой степени водонасыщения до насыщенные водой, слабосжимаемый, с прослоями слабосцементированного гравелистого песчаника	
4	2,8 - 4,6	1,7	282,93				Суглинок полутвердый, просадочный	
2	4,6 - 12,0	7,3	275,53				Песок пылеватый, от малой степени водонасыщения до насыщенные водой, слабосжимаемый, с прослоями слабосцементированного гравелистого песчаника	
				Q				

Скважина №2					Абсолютная отметка скважины 288,45			
Дата проходки: 20.09.2007г.								
№ ИГЭ	Глубина залегания ИГЭ, м.	Мощность ИГЭ, м.	Абсолютная отметка м.	Геологический возраст	Литологический разрез	Одобр	Описание грунтов	УГВ Появл.м Устан. м
1	0,0 - 0,92	0,92	286,85	Q			Супесь твердая, просадочная	5,81
3	0,92 - 2,9	1,75	285,64				Песок пылеватый, от малой степени водонасыщения до насыщенные водой, слабосжимаемый, с прослоями слабоцементированного гравелистого песчаника	
4	2,9 - 4,66	1,8	280,31				Суглинок полутвердый, просадочный	
2	4,66 - 12,31	7,8	272,12				Песок пылеватый, от малой степени водонасыщения до насыщенные водой, слабосжимаемый, с прослоями слабоцементированного гравелистого песчаника	

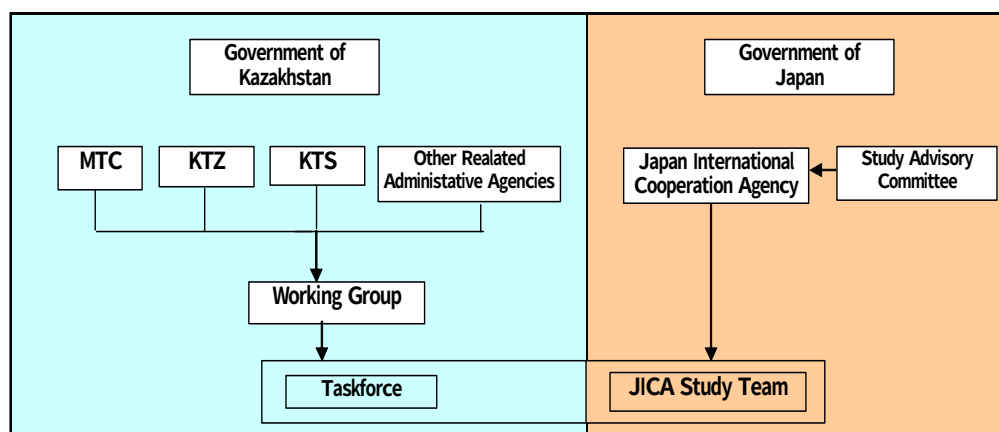
Well site №2

Date of drilling: September 20, 2007

TVDSS 288.45

№ row	EGE occurrence depth, m.	Thickness, m	TVDSS m.	Geological age	Lithological well profile	Sample drawing	Soil description	Water table Arrival m Slating m
1	0.0 – 0.92	0.92	286.85	Q			Hard sinking sandy loam	5.81
3	0.92 – 2.9	1.75	285.64				Silty sand, from the least level of water saturation to waterlogged, low compressible, with interlayers of semi consolidated semigravel sandstone	
4	2.9 – 4.66	1.8	280.31				Sinking semi-solid loam	
2	4.66 – 12.31	7.8	272.12				Silty sand, from the least level of water saturation to waterlogged, low compressible, with interlayers of semi consolidated semigravel sandstone	

Attachment: STUDY EXECUTION ORGANIZATIONS



WORKING COMMITTEE

Ministry of Transportation and Communications

Pavel A. Tolstokorov	Deputy Chairman, Committee of Railway Transport MTC RK
Kurmet T. Zhumakanov	Railway Transport Regulation Division
Zhanat A. Kurmankulov	Railway Service Formation Subdivision

Joint Stock Company "National Company "Kazakhstan Temir Zhoy"

Nurlan S. Zharkenov	Director, Corporate Development Department
Talgat T. Lessov	Deputy Director, , Corporate Development Department
Timur K. Zhunusov	Deputy Director, Marketing Transportation Department
Rakhmetolla A. Kudaibergenov	Head of Division, Corporate Development Division
Sayan S. Zhurkabayev	Head of subdivision, Multinodal Transportation Development Subdivision
Nurzhan G. Alpyspekov	Marketing Devision
Indira G. Salimzhuarova	Railway Transport Marketing Division
Markhaba K. Omarova	Transportation Management, Freight Commercial Works Division
kairai A. Yermekov	Planning and Normalization of Transportation Process Division
Nurlan S. Temirbolat	Science Research Institute of Railway Transport
Nikolai P. Kim	Investment Cooperation Subdivision

Joint Stock Company "Kaztransservice"

Medet I. Ibragimov	Container Trains Subdivision
Aman K. Saganayev	Container Trains Subdivision

Kazakhstan Development Bank

Yerzhan B. Isabayev	Analysis Markets Division, Structuring and Analysis Projects Department
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Aktau International Commercial Sea Port

Bolat Kh. Ibrayev

JSC "International Bordering Cooperation Center KHORGOS"

Ibragim K. Toishibekov	Vice President
Yerbol U. Tulebayev	Vice President

Mangystau Oblast. Akimat.

Zinulla B. Kaziyeu	Adviser to Akim oblast
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JICA SUPPORTING COMMITTEE IN JAPAN

Masahiro SHIMOTANI	Kyoto University Graduate School of Economy
Ikuo MITSUHASHI	The Economic Research Institute for Northeast Asia
Toshiaki AKIMOTO	Ministry of Land, Infrastructure and Transport /Railway Bureau

JICA HEADQUARTERS

Hozumi KATSUTA	Institute for International Cooperation Senior Adviser (Transport)
Koichi MIYAKE	Executive Technical Adviser to the Director General Social Development Department
Akira NAKAMURA	Urban and Regional Development & Peace Building Team II Group II Social Development Department
Kenji MAEKAWA	Urban and Regional Development & Peace Building Team II Group II Social Development Department
Masami OKUMURA	Urban and Regional Development & Peace Building Team II Group II Social Development Department
Hideo MIYAMOTO	Transportation & ICT Team I Group III Social Development Department
Yoshiro KURASHINA	Transportation & ICT Team I Group III Social Development Department
Seiichi NEGISHI	Transportation & ICT Team I Group III Social Development Department

JICA KYRGYZ REPUBLIC OFFICE

Satoshi NAKANO	Representative of JICA Kyrgyzstan Office
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STUDY TEAM

Masaru MIKI	Leader
Toshio KIMURA	Deputy Leader (Industrial Development 1)
Toru AOYAMA	Industrial Development 2
Michiharu NOSE	International Logistics, Custom System
Kunihiro KONISHI	Logistics Marketing 1
Yoshio SATO	Logistics Marketing 2
Isao TAKATORI	Logistics Information System
Nash g. SINARIMBO	Logistics Analysis
Masazumi ONO	Logistics Analysis
Seiichiro YAMAZAKI	Railway Transport Plan 1
Takashi JORAKU	Railway Transport Plan 2
Naoto ISHIHARA	Logistics Equipment Plan
Iwao NAKAJIMA	Logistics Facilities Plan
Nobuo OSAWA	Railway Facilities Design
Shigeru KOBAYASHI	Natural Condition Study
Huyuhiko TUNEYA	Social Environment Analysis
Naoki TAKANASHI	Economic/Financial Analysis
Shigeru KATO	Administrative Coordinator