6.5.4 Atyrau

As a result of the Initial Environmental Evaluation, the following items were examined in the Environmental Impact Analysis: hazards (risk of aircraft accidents and risk of the rising of the Caspian Sea), air pollution, water pollution, noise (aircraft noise levels), and environmental impact during the construction phase (muddy water discharge).

(1) Hazards (Risk of Aircraft Accidents and Risk of the Rising of the Caspian Sea)

a) Risk of Aircraft Accidents

The situation here is similar to that at Akmola. The areas around the ends of the runway are particularly susceptible to damage in the event of an aircraft accident and, as such, in the future dwellings should be discouraged from the area by regulatory action and alternative land use.

b) Risk of the Rising of the Caspian Sea

In 1995, the water level of the Caspian Sea was 26.62m below sea level, which is 2m lower than the runway. The Caspian Sea is rising an average of 13cm per year. However, according to a study by the Kazakh Scientific-Research Hydrometeorological Institute, and with a probability of 96%, the water level in the year 2000 will not exceed 26.3m below sea level and in the year 2010 will not exceed 26.2m below sea level. However it has been calculated that in the Atyrau region the water level will rise 1.95m due to wind once every 50 years. Therefore, if that once in 50 year wind occurs in 2010 and the water level rises to 24.25m below sea level, the difference between the level of the runway and the Caspian Sea will be a mere 0.37m. At the present, a plan is being considered which would protect the city as well as the airport by increasing the height of the levee. On the other hand, moving the city and the airport is even being discussed. Since the cause of the rising of the Caspian Sea is not yet known, in the future it will be necessary to continue observation of the (part 3) situation and to take whatever measures are necessary.

(2) Air Pollution

The air pollution measurement sites nearest the airport were located more than 10km from the airport. The average annual values are shown below.

Measurement site: Lenin str.- Auezora str. (more than 10km from the airport)

Year	SO2(mg/m3)	NO2(mg/m3)	CO(mg/m3)
1993	0.002	0.023	2.1
1994	0.002	0.023	1.8
1995	0.002	0.022	2.0

Measurement site: "50th Anniversary to October" str. (more than 10km from the airport)

Year	SO2(mg/m3)	NO2(mg/m3)	CO(mg/m3)
1993	0.002	0.021	1.9
1994	0.002	0.022	1.5
1995	0.002	0.020	1.7

When compared with the same standards as used at Akmola, the values of SO2 did not exceed those standards at any measurement site, while the values of NO2 and CO were above the standards at all measurement sites. In the year 2005, it is forecast that Atyrau airport will have double the amount of both passenger and cargo volume. It is also forecast that the number of departing and arriving flights will double as well. It is thought that because the current levels of SO2 are low, they will not exceed the standards in the future. It is believed that both NO2 and CO levels will exceed the standards. In the future, in addition to investigating how much exhaust gas from aircraft contributes to air pollution, it is advisable to consider the use of fuel-efficient aircraft engines.

(3) Water Pollution

Since construction of waste treatment facilities are planned, there will be no drainage of polluted water to the surroundings after construction of these facilities. In regard to the surface water from the airport, if necessary, when the number of flights using the airport increases, it will be possible to deal with polluted water using water treatment facilities.

(4) Noise (Aircraft Noise Levels)

Forecast: **Figure 6.5.4.1** shows aircraft noise contour forecast for the year of 2020 with the weighted equivalent continuous perceived noise level (WECPNL), which was proposed by ICAO as an evaluation unit for aircraft noise. In this forecast, all the aircraft were assumed to be converted to low-noise type by 2020. It is expected that influence by the the aircraft noise would be small enough because of comparatively low traffic. However it is desirable to make alternative land use plan based on the magnitude of aircraft noise in the vicinity and to regulate dwellings there to avoid problems in the future.

(5) Environmental Impact During Construction Phase (Muddy Water Discharge)

The construction work is primarily renovation of the existing airport and seemingly will have little environmental impact. However, it is necessary to plan so that there is no negative impact from the construction on the surrounding environment and follow through with that plan.

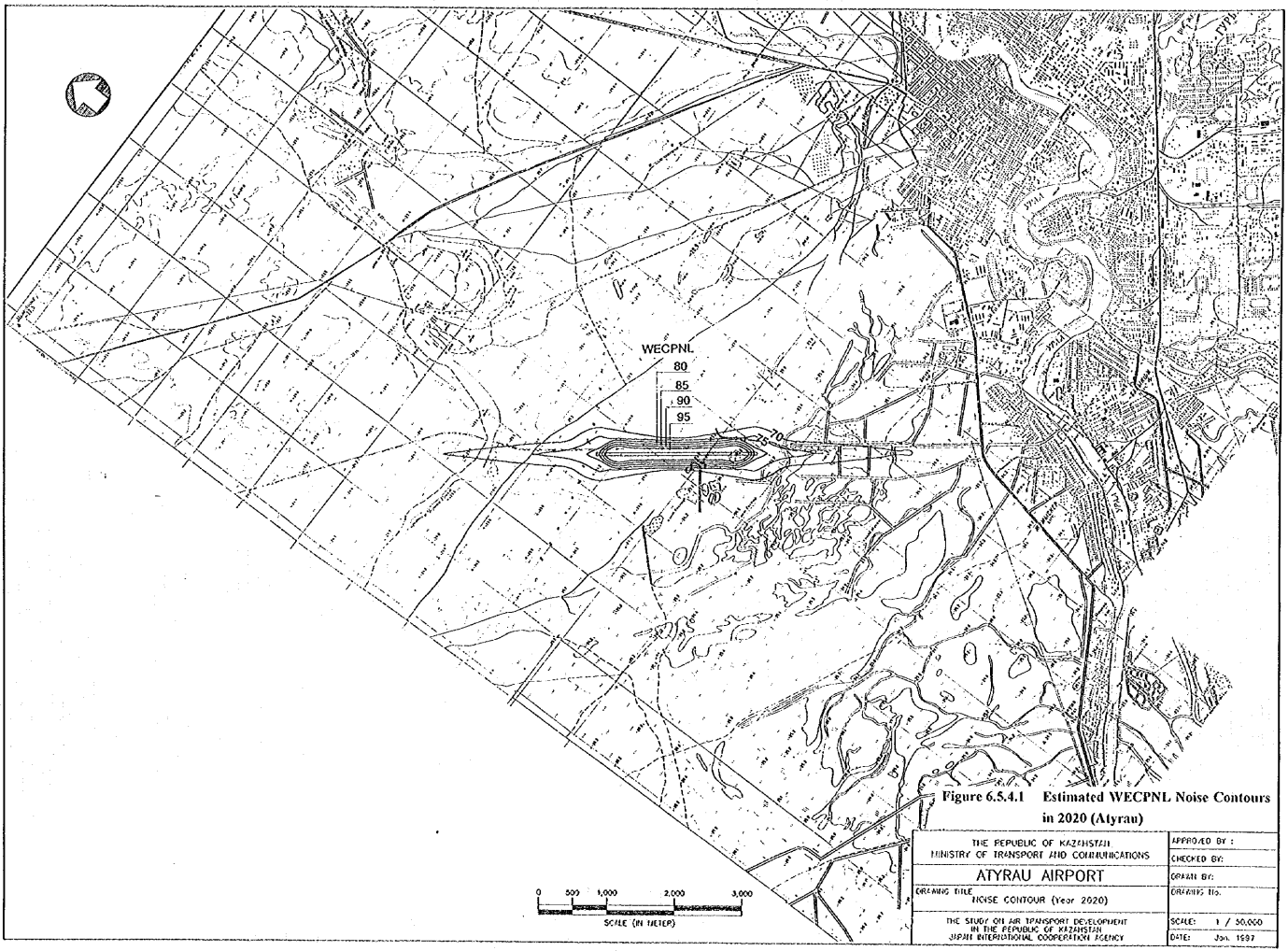

Figure 6.5.4.1 Estimated WECPNL Noise Contours in 2020 (Atyrau)

THE REPUBLIC OF KAZAKHSTAN MINISTRY OF TRANSPORT AND COMMUNICATIONS	APPROVED BY :
	CHECKED BY:
ATYRAU AIRPORT	DRAWN BY:
DRAWING TITLE NOISE CONTOUR (Year 2020)	DRAWING No.
THE STUDY ON AIR TRANSPORT DEVELOPMENT IN THE REPUBLIC OF KAZAKHSTAN JAPAN INTERNATIONAL COOPERATION AGENCY	SCALE: 1 / 50,000
	DATE: Jan. 1997

6.5.5 Aktau

As a result of the Initial Environmental Evaluation, the following items were examined in the Environmental Impact Analysis: hazards (risk of the rising of the Caspian Sea), fauna and flora (migratory birds), and the environmental impact during the construction phase.

(1) Hazards (The Risk of the Caspian Sea Rising)

In 1995, the water level of the Caspian Sea was 26.62m below sea level, which is 22m below the level of the runway. The Caspian Sea is rising an average of 13cm per year and it has been calculated that it will rise 92cm once every 50 years due to wind. According to a study by the Kazakh Scientific-Research Hydrometeorological Institute, and with a probability of 96%, the water level in the year 2000 will not exceed 26.3m below sea level and in the year 2010 will not exceed 26.2m below sea level. It is reasonable to conclude, therefore, that the rising of the Caspian Sea will have no effect on the airport.

(2) Fauna and Flora (Migratory Birds)

The Caspian Sea is 3km east of the airport and there is a lake 18km long and 3-5km wide 8km south of the airport. This lake is composed of treated waste water and is known as a dead lake in and around which fish and birds do not live. There are only plants which prefer saline soils living in the vicinity of the airport, indicating a desert environment. There are few species of birds living around the airport, among them sparrows, rock doves, and crested larks. The northward spring migration starts at the end of February and ends in June. The southward autumn migration occurs in July. These migrations generally pass over the east coast of the Caspian Sea. In the daytime, 90% of the migrating birds can be seen flying at altitudes of about 50m. Some birds fly at 100-500m altitudes, while those flying over 500m high are extremely rare. Birds which migrate at night fly in flocks that are spread out and at altitudes of 200-400m, thereby coming into conflict with aircraft. Caution is necessary.

(3) Environmental Impact During Construction Phase (Muddy Water Discharge)

The construction work is primarily renovation of the existing airport and seemingly will have little environmental impact. However, it is necessary to plan so that there is no negative impact from the construction on the surrounding environment and follow through with that plan.

6.5.6 Pavlodar

As a result of the Initial Environmental Evaluation, the following items were examined in the Environmental Impact Analysis: hazards (risk of aircraft accidents), air pollution, noise (aircraft noise levels), and the environmental impact during the construction phase.

(1) Hazards (Risk of Aircraft Accidents)

The situation here is similar to that at Akmola. The areas around the ends of the runway are particularly susceptible to damage in the event of an aircraft accident and therefore, in the future, dwellings should be discouraged from the area by regulatory action and alternative land use plan.

(2) Air Pollution

The nearest measurement sites and the average annual values are shown below.

Measurement site: Chkalor str. (about 20km from the airport)

Year	SO2(mg/m3)	NO2(mg/m3)	CO(mg/m3)
1993	0.007	0.038	1.2
1994	0.007	0.030	1.1
1995	0.006	0.035	1.0

Measurement site: Aymanov str.,26 (about 20km from the airport)

Year	SO2(mg/m3)	NO2(mg/m3)	CO(mg/m3)
1993	0.007	0.016	0.9
1994	0.008	0.015	0.2
1995	0.008	0.017	0.5

When compared with the same standards as used at Akmola, the levels of SO2 and CO did not exceed the standards at any measurment site. The NO2 levels measured at the Chkalor str. measurment site exceeded the standards while those at the Ayamonov str., 26 measurment site did not. In the year 2005, both passenger and cargo volume at Pavlodar airport are expected to be twice current levels with departing and arriving flights also increasing twofold. As the present levels of SO2 and CO, which contribute to air pollution, are low, it is expected that they will not exceed the standards in the future. It is expected, however, that NO2 levels will exceed the standards. In the future, in addition to investigating how much exhaust gas from aircraft contributes to air pollution, it is advisable to consider the use of fuel-efficient aircraft engines.

(3) Noise (Aircraft Noise Levels)

Forecast: **Figure 6.5.6.1** shows aircraft noise contour forecast for the year of 2020 with the weighted equivalent continuous perceived noise level (WECPNL), which was proposed by ICAO as an evaluation unit for aircraft noise. In this forecast, all the aircraft were assumed to be converted to low-noise type by 2020. It is expected that influence by the the aircraft noise would be small enough because of comparatively low

traffic. However it is desirable to make alternative land use plan based on the magnitude of aircraft noise in the vicinity and to regulate dwellings there to avoid problems in the future.

(4) Environmental Impact During Construction Phase (Muddy Water Discharge)

The construction work is primarily renovation of the existing airport and seemingly will have little environmental impact. However, it is necessary to plan so that there is no negative impact from the construction on the surrounding environment and follow through with that plan.

6.5.7 Summary of the Results of the Environmental Impact Analysis

The results of the Environmental Impact Analysis are summarized below.

Environmental Item	Akmola	Aktyubinsk	Almaty	Atyrau	Aktau	Pavlodar
Motor vehicle noise levels	-	-	G	-	-	-
Hazard (Aircraft accidents)	A	F	F	-	-	F
Hazard (Bird strike)	B	-	-	-	C*	-
Hazard (Rising of the Caspian Sea)	-	-	-	G	A	-
Fauna and Flora (Migratory birds)	C	-	-	-	C	-
Ground water	-	A	-	-	-	-
Air pollution	D	D	D	D	-	D
Water pollution (Surface water)	G	-	G	A	-	-
Noise (Aircraft noise levels)	F	F	F	F	-	F
Land subsidence	A	-	-	-	-	-
Environmental Impact during Construction Phase (Muddy water discharge)	E	E	E	E	E	E

A: There are no problems at this time
B: Environment will improve
C: Recommend monitoring of the situation
D: Needs further study
E: Recommendations to airport planning required
F: Recommendations to concerned governmental required
G: Investigation or countermeasures necessary
C*: Described in the Fauna and Flora (Migratory birds) section

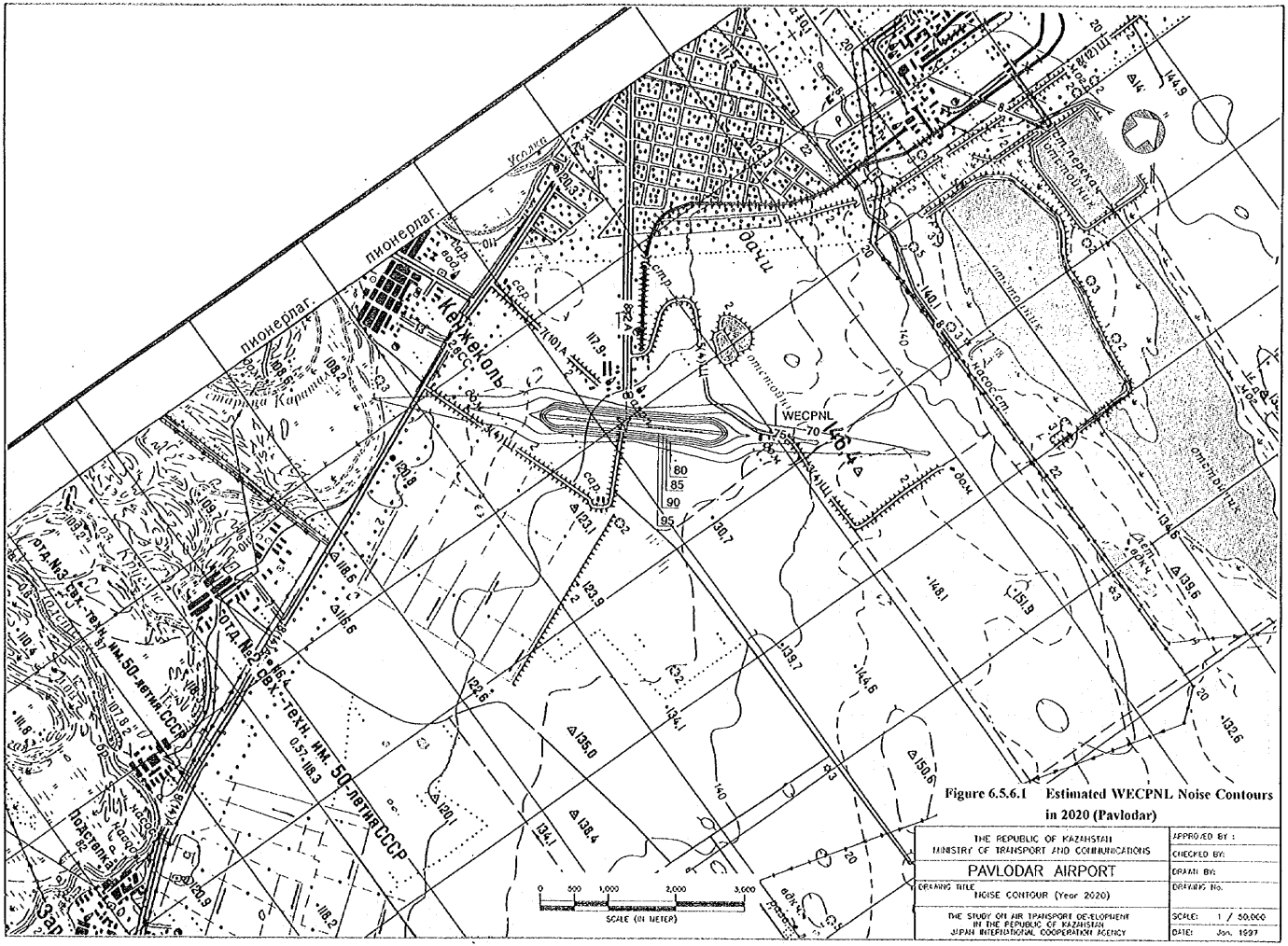

Figure 6.5.6.1 Estimated WECPNL Noise Contours in 2020 (Pavlodar)

6.6 Geological Considerations

6.6.1 General

The investigations were carried out to understand the conditions of the terrain at the airports selected for the Feasibility Study: Akmola, Aktau, Aktyubinsk, Almaty, Atyrau and Pavlodar. The investigations focused on the terminal areas.

Since Kazakhstan does not use standard penetration tests, static penetration and sampling of undisturbed samples were conducted to understand intensities of a fixed number of bearing layers or soil mediums. Static penetration resistance was calculated to the N value as indicated in **Appendix 6.6 (2)**.

6.6.2 Geological Conditions at Each Airport

The topography and geological condition at each airport summarize in **Table 6.6.2.1**. The results of the physical property tests are indicated in **Appendix 6.6 (1)**. The indicated investigation points on presumed cross sections appear in **Appendices 6.6 (3) to (8)**.

(1) Akmola

Akmola airport is located on an alluvial plain extending to the Isim river. The ground is flat and has an altitude of about 350m. Using a 15m deep boring, the composition was identified by layer as: I surface soil, II upper sandy clay, III lower sandy clay, IV sand, and V clay. The accumulation condition of the ground is almost level. During the investigation period, October 1996, the underground water level was GL-2.5m~3.0m, compared to levels of almost GL-0.8m during the rainy season and during the Spring thaw. The freezing depth during Winter is 2.2m.

Direct foundations would be the best type with Layer II as the bearing layer (average qc=37kgf/cm2). It would be necessary, however, to place the foundation core at GL-2.0m so as to avoid the influence of frost heaving on the surface layer. For pavement, if the same soil conditions exist in the runway area, the CBR value derived from the static penetration test would be about 10, sufficient bearing capacity for road foundations.

(2) Aktau

Aktau airport is located on the flat table land of the Mangusilak peninsula Cape Merobli on the east shore of the Caspian Sea. The ground is gently undulating and the altitude is 15m~20m. Using a 10m deep boring, the composition was identified by layer as: I sandy clay, II sand layer, III block limestone, IV marly limestone, and V oolitic limestone. Layers I to III are in Quaternary and Layers IV to V are limestone in the Lower Neogen age. The accumulation condition of the ground follows the topography. No ground water was evident to the boring depth of 10m. The freezing depth in Winter is 0.8m.

Direct foundations would be the best type with Layer III or IV as the bearing layer (GL-2~4m. For pavement, if the same soil conditions exist in the runway area., the CBR value would be one assuming a deformation coefficient of 10, sufficient bearing capacity for road foundations.

(3) Aktyubinsk

Aktyubinsk airport is located on alluvial lowlands along the Irek river between the gently rolling hills extending along the Russian border and the Aral Sea to the South. The ground altitude is 218m ~220m, inclining gently to the north. From the results of a 15m boring, the composition was identified by layer as: I surface soil, II sandy clay, III sand, IV mixed sand conglomerate, and V sand conglomerate. The accumulation condition of the ground conforms almost exactly to the topography. The underground water level is about GL-12m. The freezing depth in Winter is 2.16m. Direct foundations would be the best type with layer III as the bearing layer, about GL-2m, taking frost heaving into account. For pavement, if the same soil conditions exist in the runway area, the CBR computed from the static penetration resistance value would be 10, sufficient bearing capacity for road foundations.

(4) Almaty

Almaty airport is located on fan shaped ground on the plain extending from the foot of the Thiliyucki Alatau mountain range which run east-west along the border with Kyrgyzstan. The ground altitude is 670m ~ 680m inclining gently to the north. From the results of a 25m deep boring, the composition by layer was identified as: I raised soil, II upper sandy clay, III sand, IV lower sandy clay, V alternating sand/clay, VI mixed sand conglomerate, and VII sand conglomerate. The accumulation condition of the ground follows the topography closely. The underground water level is 3.5m~4.0m. The freezing depth in Winter is 1.25m.

Layer II has a bearing capacity of 10tf/m2 so it would be possible to use this for direct foundations. To deal with the earthquake risk, however, a pile foundation is recommended bearing on the lower part of Layer VI or on Layer VII. For pavement, if the same soil conditions exist in the runway area., the CBR value of Layer II would be 2~3, computed from the static penetration resistance, sufficient bearing capacity for road foundations.

(5) Atyrau

Atyrau airport is located on the delta of the Ural River on the north shore of the Caspian Sea. The ground is almost flat and has an altitude of about 24m. From the results of a 15m boring, the composition was identified as: I surface soil, II upper sandy clay, III lower sandy clay, IV sandy soil, and V gypsum. The accumulation condition of the ground follows the topography closely. The underground water level was GL-3.0m, during October 1996, the investigation period. It rises to GL-0.5m~0.8m during the rainy season and spring thaw. The freezing depth in Winter is 1.25m.

Direct foundations would be the best type with Layers III to IV as the bearing layers. For pavement, if the same soil conditions exist in the runway area., the CBR

value of Layer II would be about 3 and of layer III about 10, computed from the static penetration resistance, sufficient bearing capacity for road foundations.

(6) Pavlodar

Pavlodar Airport is located on gently rolling table land near the Iritish river. The ground is gently undulating with an altitude of 118m~121m. From the results of a 15m deep boring, the composition was identified as: I surface soil, II sandy soil, III sand and IV hard clay. The accumulation condition of the Layers I and II follows the topography closely. For Layer III, there are large variations in layer volume and the topography reflects the shape of the main layer. The underground water level is about 3.0m but this changes drastically according to location. The freezing level in Winter is 2.2m.

Direct foundations would be the best with Layer II as the bearing layer. Taking frost heaving into account, the bottom of the foundations should be below GL-2m. For pavement, if the same soil conditions exist in the runway area, the CBR value of Layer II would exceed 10, as computed from the static penetration resistance, sufficient bearing capacity for road foundations.

Table 6.6.2.1 Ground condition of terminal area

Airport	Division	Name of soil	Thickness of layer (m)	Bulk density ρ (g/cm3)	Static penetrate resistance Pq=qc (kgf/cm2)	Convert N value	Cohesion C (kPa)	Angle of internal friction ϕ (degree)	Module of deformity E (Mpa)
Akmola	I	surface soil	0.2	–	–	–	–	–	–
	II	upper sandy clay	2.3-2.8	1.82	37	12	14	24	18.0
	III	lower sandy clay	4.3-6.1	2.01	86	28	20	27	14.5
	IV	sand	4.2-6.3	1.98	460<	60<	2	38	50
	V	clay	2<	1.97	–	–	87	22	21.6
Aktau	I	sandy clay	1.0-1.8	1.63	–	–	12	25	10.4
	II	sand	0-0.8	1.73	–	–	1	35	30
	III	block of limestone	0.8-0.6	–	–	–	–	–	35
	IV	marly limestone	1.7-4.0	2.2	–	–	–	–	–
	V	oolitic limestone	5.0<	2.1	–	–	–	–	–
Aktybinsk	I	surface soil	0.3	–	–	–	–	–	–
	II	sandy clay	0.6-1.7	1.77	35	11	22	24	14.5
	III	sand	1.0-2.2	1.91	167	42	24	17	16.0
	IV	gravel mixed sand	1.3-3.3	1.61	300<	50<	1	40	40
	V	sand gravel	9.8<	1.59	–	–	1	40	40
Almaty	I	raised soil	0.8-1.3	–	11	3-4	–	–	–
	II	upper sandy clay	2.6-4.5	1.96	9	3	31	24	15.6
	III	sand	0-0.5	1.94	45	11	1	35	30
	IV	lower sandy clay	2.4-9.1	1.99	14	5	26	22	15.2
	V	clay-sand alternation	7.0-10.5	2.03	18(96)	6(24)	26	20	14.2
	VI	gravel mixed sand	3.5-7.9	1.95	60-300<	10-50<	1	40	40
	VII	sand gravel	2.6<	2.28	–	–	–	–	50
Atyrau	I	surface soil	0.2	–	–	–	–	–	–
	II	upper sandy clay	0.6-0.8	1.82	10	3	29	26	8.4
	III	lower sandy clay	0-2.0	1.84	30	10	20	19	7.97
	IV	sandy soil	4.2-6.0	1.98	120	30	12	27	22.5
	V	gypsum	9.0<	2.90	–	–	–	–	–
Pavlodar	I	surface soil	0.4-0.6	–	–	–	–	–	–
	II	sandy soil	2.1-2.5	1.80	110	27	17.5	34	19
	III	sand	2.5-6.8	2.04	180	45	2	38	40
	IV	hard clay	9.8<	1.89			89.2	15	14.7

6.7 Economic and Financial Analyses

6.7.1 General

This chapter examines the economic and financial feasibility of the short-term development of several major airports in Kazakhstan. The purpose of the economic analysis is to judge whether the short-term development of each of these airports is feasible or not from the viewpoint of the national economy, while the financial analysis aims to evaluate the financial feasibility of the projects from the standpoint of airport management and operation.

6.7.2 Economic Analysis

(1) Basic Concept of Economic Analysis

The economic analysis is carried out methodologically based on a "benefit/cost analysis" which compares the benefits and costs associated with project implementation. If the development costs generate economic benefits or surpluses at the rate equal to or above the opportunity cost of capital, then the project is said to be economically feasible. The concept of the "benefit/cost analysis" and the formula to calculate the rate of economic return (economic international rate of return: EIRR) is shown in **Table 6.7.2 (1)**.

Table 6.7.2(1) Concept of Benefit/Cost Analysis

	"with the project" (1)	"without the project" (2)	Difference (1) - (2) (3)	EIRR
Cost	Cn	Co	$\Delta C = Cn - Co$	EIRR=i, Satisfying the following formula: $\sum_t \frac{(\Delta B - \Delta C)_t}{(1+i)^t} = 0$ where, t=Year (1, 2, ...)
Benefit	Bn	Bo	$\Delta B = Bn - Bo$	

In the above table, if the Economic Internal Rate of Return (i) comes out equal to or over the opportunity cost of the investment, implementation of the project is generally regarded as feasible. The assumed opportunity cost of capital in Kazakhstan was 10% to 12% in real value. As criteria for project feasibility, the net present value (NPV) and the benefit/cost (BCR) are also applied together with the EIRR.

(2) General Assumption

The evaluation of the benefits and costs for the project were based on the following assumptions:

a) Evaluation of Benefits and Cost

Evaluation of benefits and costs is carried out in Tenge (and US$) at constant 1996 prices. The exchange rate is assumed as Tenge=US$70.3.

b) Import duties, Taxes and Services for the Project

No taxes on imports for the project are included because this project would be done by foreign loan to promote the public welfare and interest. (See Note 6.7.2(1)). In the same sense, the import duty and VAT on the aircraft fuel sold for the incremental aircraft movements, which will result from project implementation, are regarded as net benefits.

Tax such as VAT (Value added tax) levied on earnings resulting from the project is fundamentally regarded as net benefit (See Note 6.7.2(1)*).

In Japan, aircraft fuel tax can be available for the airport improvement project. (See **Appendix-6.7.2**).

c) Financial Cost and Economic Cost

The non-traded goods and services purchased locally for this project is evaluated at the "economic cost". For this, a "conversion factor" to convert "financial cost" into "economic cost" will be applied. The conversion factor is set at 0.82 in accordance with widely accepted concepts for this type of project.

d) Project life and Terms for EIRR calculation

The project life is calculated from the value of the assets formed and/or constructed by the said project implementation and their service lives as shown in **Table 6.7.2 (2)**. An average project life of 24 years is applied for this study.

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* Note 6.7.2(1) Concept of Import Duty and Tax

Even if import duties and taxes are levied on the goods and services purchased by the Government, these duties and taxes are eventually returned to the Government . Accordingly, any duty or tax should not be counted as the costs or revenues, for the payment of duty and tax, and their revenues are eventually offset. VAT levied on the earnings triggered by the foreign loan funded part of the project is fundamentally regarded as a surplus. However, the VAT levied on the earnings from the locally funded part of the project should not be counted as a surplus since the source of the fund is the tax itself.

Table 6.7.2 (2) Average Project Life

Asset	Value of Asset(%)	Project Life(Years)	Weighted Project Life
Civil	25	32	8.0
Architecture	35	32	11.2
Equipments	40	12	4.8
Average	-	-	24.0

Note: Component ratios are estimated by consultant.

For EIRR calculation, discounting period is assumed 25 as years inclusive, of the construction period, in order to avoid uncertainties in the distant future. It should be noted that the benefits and costs in the distant future do not substantially affect the result of the EIRR calculation, because the discounted amount of the benefits and costs will become relatively small.

6.7.3 Assumptions for "without the project" and "with the project"

This project is designed to expand the existing airport to cope with the forecast increase of air traffic up to the year 2005 ~ 2010.

However, the project costs in this stage include a considerable amount of funds to restore the obsolete and unsatisfactory existing facilities. In addition, the project costs include some inseparable or common funds to cope with the future traffic demand beyond the year 2005 ~ 2010. Accordingly, this study defines the traffic volume in the cases of "without project" and "with project" conditions, as shown in **Figure 6.7.3 (1)**. The traffic volume "without project" is constant and identical to that of 1993, while the incremental traffic volume resulting from project implementation ("with project") is equal to the amount derived by deducting the "without project" traffic volume from the forecast traffic volume.

Considering the inseparability of the effectiveness of the investments in Phase I and Phase II of the project, this study will totally evaluate both phases. However, the traffic demand is assumed to be constant after 2015 which is the target year for Phase-II of the project to cope with the increasing traffic demand.

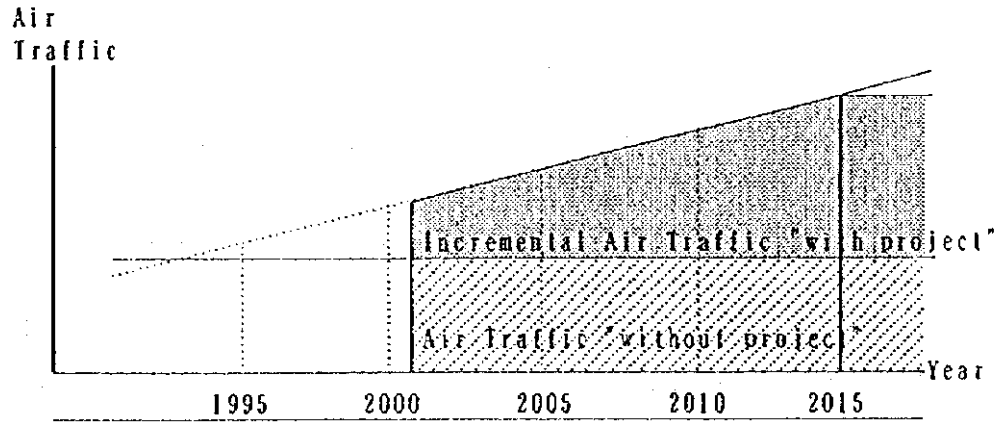

Figure 6.7.3 (1) Assumed Classification of Air Traffic Volume in case of "without project" and "with project"

6.7.4 Benefits Identification

(1) Definition of Incremental Net Benefits

As per the "Concept of Benefit/Cost Analysis" of the **Table 6.7.2 (1)**, the incremental net benefits are eventually needed to be obtained. The incremental net benefit is defined as shown in Formula (6.7.4(1) ~ 6.7.4(3)).

Where, $\triangle NB$ is incremental net benefit; $\triangle B$ is incremental benefit; $\triangle C$ is incremental cost, B_n and B_o mean respectively benefit in case of "with project" and "with project" and "without project", and C_n and C_o mean respectively the cost in case of "with project" and "without project"

(2) Benefits by Category

There are four major categories of benefits to be expected from project implementation as shown in **Figure 6.7.4 (1)**.

It should be noted that the benefits covered in this study are limited only to those benefits to the national economy of Kazakhstan.

a) Benefits generated by airport services

As clear from **Figure 6.7.4 (1)**, the benefits are generated from the airport in the form of passenger fees, landing charges, navigation fees, terminal fee, rentals, etc.

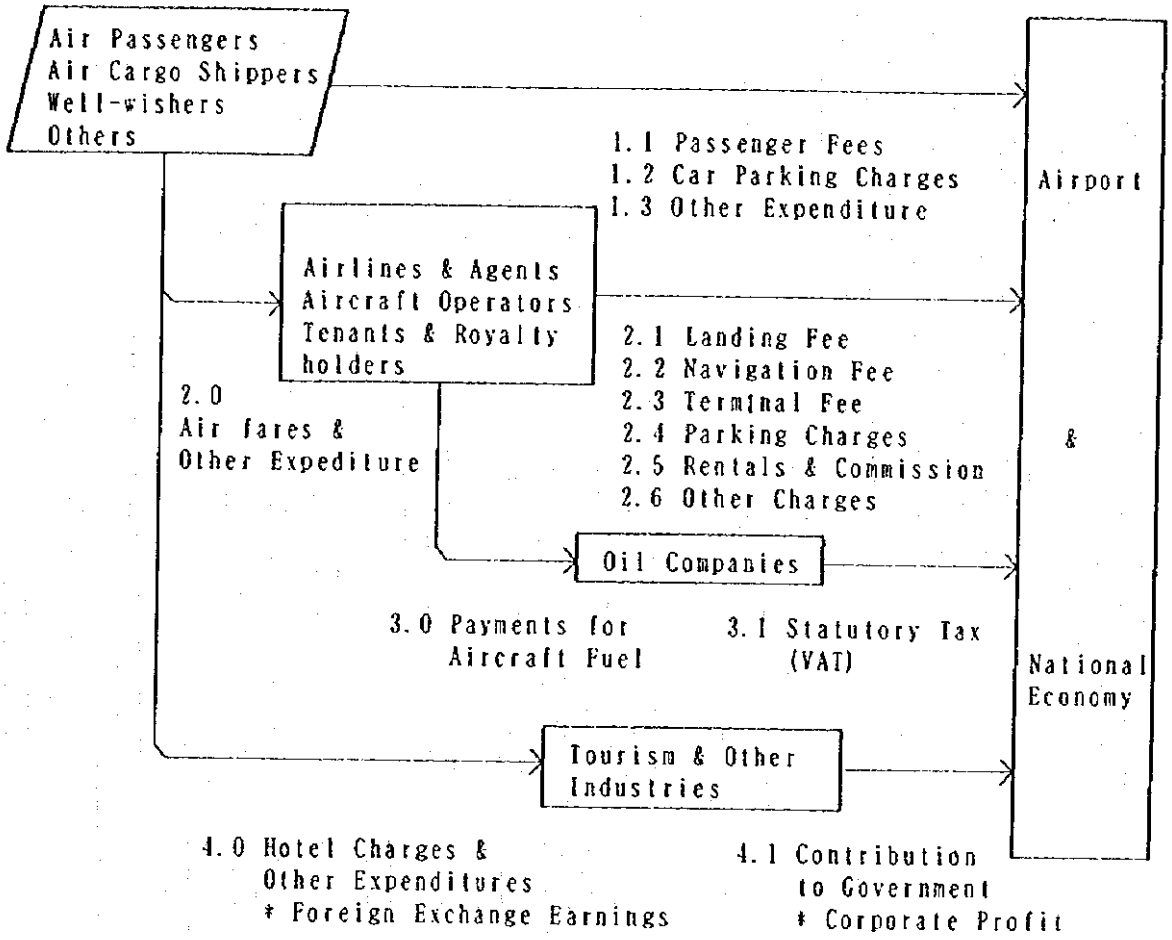

Figure 6.7.4 (1) Typical Money Flow and Benefit Sources on Airport Services

b) Benefits generated for other transport activities

Incremental benefits generated in the transport sector than airport services are:

(a) Airport improvement

(b) Expansion of the possibilities for:

- Increase of aircraft flight movements
- Operation of big size and larger cruising range aircraft
- Expansion of market

- Increase of air traffic demand

Also economic benefits for "time saved" and "cost saved" are generated for the national economy.

It should be noted that these benefits should be measured so as to cover the various benefits without contradiction and duplication. The major incremental benefits generated in the transportation sector are as follows:

(a) Incremental benefit for increasing air traffic demand including time saving benefits

Typical incremental benefits generated by the project are measured as an increment of the fare and charge revenue (or payment) due to the incremental air passengers who pay much more than passengers of rail or bus transportation.

This benefit, from another viewpoint, can be expressed as the benefit of saving time for the users who enjoy much faster air transportation. However, it should be noted that these two benefits become equal as far as these are measured at the market prices (See Note 6.7.4(1)*).

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* Note 6.7.4 (1) Basic Concept and Quantification of Benefits
Equality in Quantities of Benefits measured by Incremental Net Revenue Benefit and User Time Saving Benefits

To make it simple, the following example is applied to explain the equality in the quantities of the net benefits measured by the incremental net revenue and user's time saving benefit.

(Example)

On a certain route;

① Air traffic is increased by 200 due to diversion from rail traffic

② Trip time and trip cost (fare and charge) are assumed as follows

Mode	trip time (hour)	trip cost (Tenge)
Air	2.0	1,000
Rail	6.0	350

③ Saving time value at the market prices (Tenge/hour)

(1,000 - 350)/(6.0 - 2.0) =162.5

From the above example, the following are concluded:

A: incremental revenue

A = (1,000 - 350) • 200 = 130,000

B: Saving time benefits

B = 162.5 • (6.0 - 2.0) • 200 = 130,000

As can be seen, the net incremental revenue is regarded as equal to the net saving time benefit.

In addition, this time-saving-benefit-approach can be applied only for passenger shifting from other modes to the air transportation, but not for the induced or generated air passengers. Because these passengers have no comparison in trip time and trip cost with other modes.

The "incremental-revenue-approach" can be applied not only for both domestic diverted and induced air passengers but also for international air passengers, most of which have no options for modal choice. In other words, aviation is the sole means of transportation for those overseas travelers. The basic concept and measurement of the benefits are mentioned in Note 6.7.4(1).

The cost saving benefits for national airlines accompanied by international operations with relatively larger and longer range aircraft are quantified together with other benefits as operating profits in the same relevant quantification models.

It is also noteworthy that the benefits to be counted are limited only to those belonging to the national economy of Kazakhstan.

(b) Concept of Incremental Benefits for International Passengers

The incremental benefits generated from increasing international passengers are limited to those passengers flown on Kazakhstan aircraft.

(3) Benefits brought about in the tourism industry

A major benefit brought about in the tourism industry is the "income multiplier effect" accompanied by the incremental receipts of foreign currencies. (See Note 6.7.4(2)*). This study includes a part of this effect as a benefit considering the importance of foreign currencies receipts.

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* Note 6.7.4 (2) Economic Effect of Receipt of Foreign Currency

It is widely accepted that the receipt of foreign currencies from foreign visitors for the tourism industry contributes considerably to the local economy. According to an article, a number of studies have assessed the economic significance of tourism in terms of the impact of tourist expenditure on income generation. For instance, the income multiplier of tourist expenditure in Vanuatu has been estimated at 0.56 and in Tonga at 0.42. In other words, every 100 dollars of tourist expenditure generates an income of $56 and $42 to the local economies of Vanuatu and Tonga. (Source: Courier No.122, July-August, 1990, P82). In consideration of the importance of the foreign currencies to promote economic development, this study counts a part of the above "income multiplier" as an benefit resulting from project implementation.

(4) Benefits brought about in the fuel and oil industry

Any tax or excise tax paid on the domestically produced or imported aircraft fuel are regarded as a net benefit.

6.7.5 Quantification of Incremental Net Benefits by Category

For the simplicity the quantification of the benefits will be carried out collectively and lump-sum-wise using average and summarized data. Each of the benefits were originally quantified in US Dollars and only summarized benefits were converted to Kazakhstan currency of Tenge by category.

(1) Incremental Benefits in Airport sector

The benefits in the airport sector are divided into airport facility fees and passenger fees.

(1.1) The incremental benefits from airport facility fees includes those from landing fee, navigation fee, terminal fee, and others including rentals and commissions which are quantified by Formula (6.7.5(1)~6.7.5(2)).

$$APB = \Sigma FFD_i \cdot 1/2 \cdot DACT_i + \Sigma FFI_i \cdot 1/2 \cdot IACT_i \text{ --------- } (6.7.5(1))$$

where, APB : Increase of total revenue from airport facility fees. (Thousand US$)
FFDi :Unit price of each fee and charge by aircraft type(i) (US$)
(See Table 6.7.5(1))
LFI_i : Unit price of each fee and charge by aircraft type(i) (US$)
(See Table 6.7.5(1))

Table 6.7.5 (1) Assumption of Airport Facility Fees

(US$)

	B747 395t.	B767 136t.	B737 50t.	F-50 20t.
A. Domestic(CIS)				
1. Fundamental Fees	3,569	1,523	778	403
-Landing Fee	433	154	61	29
-Navigation Fee	1,057	633	426	238
-Terminal Fee	2,078	737	292	137
2. Other charges including Commission,Rentals, etc. ((1) x 0.372) #	1,328	567	289	150
3. Domestic total	4,897	2,090	1,067	553
B. International(Foreign)				
1. Fundamental Fees	8,297	2,532	1,107	538
-Landing Fee	3,555	1,224	458	180
-Navigation Fee	2,012	952	528	320
-Terminal Fee	730	356	129	38
2. Other Fees including Royalties & Rentals,etc. (1 x 0.372)	2,342	942	412	200
3. International total	8,639	3,474	1,519	738

#: The coefficient of 0.372 is assumed considering the fee systems in some country (See Appendix 6.7.5 (1)).
Note: Details of the calculation is shown in Appendix 6.7.5 (2)

$DATT_i$: Incremental domestic(CIS) aircraft movements of aircraft type (i)
(Landing + Take off)
(See Appendix-6.7.5(1))

IACTi: Incremental international(Foreign) aircraft movements of aircraft type (i) (Landing + Take off)
(See Appendix-6.7.5(1))

Calculations and output are shown in Table 6.7.5 (2).

Table 6.7.5 (2) Estimate of Incremental Revenues from Airport Facility Fees and Other Changes

Airport	Akmola					Aktau				
Year	1995	2000	2005	2010	2020	1995	2000	2005	2010	2020
1. Aircraft Mevements										
1.1 CIS Routes										
-LJ(B747)			0		0			0		0
-MJ(B767)			1,498		5,831			0		1,155
-SJ(B737)			11,420		30,688			5,785		11,555
-TP(F50)			0		2,012			0		578
-Total			12,909		37,731			5,785		13,288
1.2 Foreign Routes										
-LJ(B747)			0		0			0		0
-MJ(B767)			498.5		1,569			0		165
-SJ(B737)			3760.5		9,572			815		1,645
-TP(F50)			0		628			0		82
-Total			4,251		11,769			815		1,892
2. Revenue from Facility Fees(Thousand US$)										
2.1 CIS Routes										
-LJ(B747)	0	0	0	0	0	0	0	0	0	0
-MJ(B767)	194	875	1,556	3,406	5,256	0	0	0	604	1,207
-SJ(B737)	759	3,427	6,095	11,237	16,379	1,785	2,436	3,088	4,627	6,167
-TP(F50)	0	0	0	278	556	0	0	0	80	160
-Subtotal	952	4,302	7,651	14,921	22,191	1,785	2,436	3,088	5,311	7,534
2.2 Foreign Routes										
-LJ(B747)	0	0	0	0	0	0	0	0	0	0
-MJ(B767)	106	479	852	1,789	2,726	0	0	0	143	286
-SJ(B737)	356	1,606	2,856	5,062	7,269	358	488	619	934	1,249
-TP(F50)	0	0	0	116	232	0	0	0	15	30
-Subtotal	462	2,085	3,708	6,967	10,226	358	488	619	1,092	1,566
Total Revenue(Th.US$)	1,414	6,386	11,359	21,888	32,417	2,143	2,925	3,706	6,403	9,099
3. Incremental Revenue (Th.US$)	-	4,972	9,944	20,474	31,003	-	782	1,563	4,260	6,956

Airport	Aktyubinsk					Almaty				
Year	1,995	2,000	2005	2010	2020	1995	2000	2005	2010	2020
1. Aircraft Mevements										
1.1 CIS Routes										
-LJ(B747)			0		0			2,093		6,251
-MJ(B767)			0		619			7,324		9,377
-SJ(B737)			1,228		4,333			41,853		42,194
-TP(F50)			0		0			2,093		1,042
-Total			1,228		4,952			53,363		58,864
1.2 Foreign Routes										
-LJ(B747)			0		0			547		1,669
-MJ(B767)			0		41			1,916		2,503
-SJ(B737)			92		287			10,947		11,266
-TP(F50)			0		0			547		278
-Total			92		328			13,957		15,716
2. Revenue from Facility Fees(Thousand US$)										
2.1 CIS Routes										
-LJ(B747)	0	0	0	0	0	1,749	3,436	5,123	10,214	15,305
-MJ(B767)	0	0	0	323	647	2,612	5,132	7,652	8,724	9,795
-SJ(B737)	386	521	655	1,484	2,312	7,625	14,981	22,337	22,428	22,519
-TP(F50)	0	0	0	0	0	197	388	579	433	288
-Subtotal	386	521	655	1,807	2,959	12,184	23,938	35,692	41,800	47,908
2.2 Foreign Routes										
-LJ(B747)	0	0	0	0	0	887	1,586	2,364	4,787	7,210
-MJ(B767)	0	0	0	36	71	1,136	2,232	3,328	3,838	4,348
-SJ(B737)	41	56	70	144	218	2,838	5,576	8,313	8,434	8,555
-TP(F50)	0	0	0	0	0	69	135	202	152	103
-Subtotal	41	56	70	180	289	4,850	9,529	14,207	17,212	20,216
Total Revenue	428	577	725	1,987	3,249	17,034	33,466	49,899	59,011	68,124
3. Incremental Revenue (Th.US$)	-	149	298	1,559	2,821	-	16,433	32,865	41,978	51,091

Airport	Atyrau					Pavlodar				
Year	1995	2000	2005	2010	2020	1995	2000	2005	2010	2020
1. Aircraft Movements										
1.1 CIS Routes										
-LJ(B747)			0		0			0		0
-MJ(B767)			0		595			0		1,264
-SJ(B737)			3,569		7,145			4,400		8,849
-TP(F50)			0		595			0		0
-Total			3,569		8,336			4,400		10,113
1.2 Foreign Routes										
-LJ(B747)			0		0			0		0
-MJ(B767)			0		65			0		56
-SJ(B737)			391		775			220		391
-TP(F50)			0		65			0		0
-Total			391		904			220		447
2. Revenue from Facility Fees(Thousand US$)										
2.1 CIS Routes										
-LJ(B747)	0	0	0	0	0	0	0	0	0	0
-MJ(B767)	0	0	0	311	622	0	0	0	660	1,321
-SJ(B737)	1,124	1,515	1,905	2,859	3,813	1,097	1,723	2,348	3,536	4,723
-TP(F50)	0	0	0	82	165	0	0	0	0	0
-Subtotal	1,124	1,515	1,905	3,252	4,600	1,097	1,723	2,348	4,196	6,044
2.2 Foreign Routes										
-LJ(B747)	0	0	0	0	0	0	0	0	0	0
-MJ(B767)	0	0	0	56	112	0	0	0	48	97
-SJ(B737)	175	236	297	443	589	78	123	167	232	297
-TP(F50)	0	0	0	12	24	0	0	0	0	0
-Subtotal	175	236	297	511	725	78	123	167	280	394
Total Revenue	1,299	1,750	2,202	3,763	5,325	1,175	1,845	2,515	4,476	6,437
3. Incremental Revenue (Th.US$)	-	451	902	2,464	4,025	-	670	1,340	3,301	5,262

Note: Data for the year 1995 and 2000 are extrapolated using the index of passenger movements and that for 2010 is linear interpolated.

(1.2) Incremental benefits for passenger fees

Incremental benefit for the passenger fees is quantified by the formula(6.7.5(2)).

$$PFB = DPFR \cdot 1/2 \cdot IDP + IPFR \cdot 1/2 \cdot IIDP \qquad (6.7.5(2))$$

where, PFB : Incremental total benefit(revenue) of air passenger fee. (Thousand US$)

DPFR: Unit price of domestic air passenger fee per passenger. (US$4.0).

IPFR : Unit price of international(foreign) air passenger fee per passenger (US$11.0)

IDP : Incremental domestic(CIS) air passenger movements (after introduction of "hub and spoke" transportation system) (departure + arrival) (thousand passengers)) (Appendix-6.7.5(1))

IIDP : Incremental international (foreign) air passenger movements (after introduction of "hub and spoke" air transportation system) (departure + arrival) (thousand passengers) (Appendix-6.7.5(1))

Calculations and output are shown in Table 6.7.5.(3).

Table 6.7.5 (3) Estimate of Incremental Revenue from Airport Passenger Fee

Airport	Akmola					Aktau				
Year	1995	2000	2005	2010	2020	1995	2000	2005	2010	2020
1. Annual Pax after Change in Air Route System(000)										
- Domestic(CIS)	-		1,001		2,315	-		430		845
-International(Foreign)	-		237		1,294	-		56		225
-Total	154		1,237		3,609	281		486		1,070
2. Revenue from Pax Fees (Thousand US$)										
- Domestic(CIS)			2,001	3,316	4,630			860	1,275	1,690
-International(Foreign)			1,301	4,209	7,117			308	773	1,238
-Total	411	1,857	3,303	7,525	11,747	675	922	1,168	2,048	2,928
3. Incremental Revenue (Th.US$)	-	1,446	2,892	7,114	11,336	-	246	493	1,372	2,252

Airport	Aktyubinsk					Almaty				
Year	1995	2000	2005	2010	2020	1995	2000	2005	2010	2020
1. Annual Pax after Change in Air Route System(000)										
- Domestic(CIS)	-		117		269	-		2,568		3,374
-International(Foreign)	-				61	-		2,163		3,057
-Total	69		117		330	1,615		4,731		6,431
2. Revenue from Pax Fees (Thousand US$)										
- Domestic(CIS)			234	386	538			5,136	5,942	6,748
-International(Foreign)			0	168	336			11,897	14,355	16,814
-Total	138	186	234	554	873.5	5,814	11,423	17033	20,297	23562
3. Incremental Revenue (Th.US$)	-	48	96	416	736	-	5,609	11,218	14,483	17,747

Airport	Atyrau					Pavloder				
Year	1995	2000	2005	2010	2020	1995	2000	2005	2010	2020
1. Annual Pax after Change in Air Route System(000)										
- Domestic(CIS)	-		242		519	-		292		675
-International(Foreign)	-		41		83	-		44		89
-Total	167		283		602	157		336		764
2. Revenue from Pax Fees (Thousand US$)										
- Domestic(CIS)			484	761	1,038			584	967	1,350
-International(Foreign)			226	341	457			242	366	490
-Total	419	564	710	1,102	1,495	386	606	826	1,333	1,840
3. Incremental Revenue (Th.US$)	-	145	291	683	1,076	-	220	440	947	1,454

Note(1): According to the instruction of №15/Y, airport passenger fee is levied on each passengers flying out from airport including transit passengers.

Note(2): The airport passenger fee for foreigners is collected from airlines, paying to the airport.

(2) Incremental Net Benefit in Air Transportation Sector

Incremental net benefits are produced from air passenger and air cargo transportation.

(2.1) Incremental net benefit for air passenger transportation

The incremental net benefit for the domestic and international passenger transportation is quantified by Formula 6.7.5(3)~6.7.5(7).

$$NBTP = (TPRD - TPCD) + (TPRI - TPCI) \quad \text{---------- (6.7.5(3)}$$

where, NBTP : Incremental net benefit for the air passengers earned by Kazakhstan airlines.(Thousand US$)
TPRD : Incremental revenue for the CIS air passengers earned by Kazakhstan airlines.(Thousand US$)
TPCD : Incremental cost for the CIS air passengers expensed by Kazakhstan airlines.(Thousand US$)
TPRI : Incremental revenue for the international (foreign) air passengers earned by Kazakhstan airlines. (Thousand US$)
TPCI : Incremental cost for the international(foreign) air passengers expensed by Kazakhstan airlines. (Thousand US$)

$$TPRD = IDODP*(URDA - URDR) \quad \text{---------- (6.7.5(4)}$$

where, IDODP: Incremental number of domestic(CIS) diverted air passengers from the mode (m) which are carried by Kazakhstan airlines. (Thousand passengers)

URDA: Average tariff revenue per domestic(CIS) air passenger (US$ per passenger)
URDR: Average tariff revenue per railway passenger (US$ per passenger)

(Note) Here it should be noted that the diverted passengers from other modes to air transportation actually consist of those from railway and road transportation. However, for the simplicity, this study assume only one mode of railway as representative.

$$TPCD = IDDP(UEDA-UEDR) \quad \text{---------- (6.7.5(5))}$$

where, UEDA : Average direct operating expense per air passenger(US$)
The direct operating unit expense is assumed to be 78% of the unit operating revenue, presuming 12% of the revenue is operating profit and the remaining 10% is the overhead expense which is not needed to expense for the additional production.
The above 12% of profit consists of an assumed proper rate of operating profit of 8% and an assumed rate of operating profit of

4% is expected to be realized by the flight operation of those aircrafts of larger size and longer distant cruising.

UEDR : Average operating expense per diverted passenger for the shifted representative mode of railway. (US$/Pax.)
The unit direct operating expense is assumed to be 90% of the unit operating revenue.

TPRI = IIODP * URIA ---------- (6.7.5(6))

where, IIODP: Incremental number of international(foreign) air passengers carried by Kazakhstan airlines. (Thousand passengers)
Here it should be noted that the IDODP is produced using original air passenger movements before "Hub and Spoke".

URIA: Average tariff revenue per air passenger (US$ per passenger)

TPCI = IIODP * UEIA ---------- (6.7.5(7))

where, UEIA : Average direct operating expense per air passenger(US$)
The direct operating unit expense is assumed to be 78% of the unit operating revenue, presuming 12% of the revenue is operating profit and the remaining 10% is the overhead expense which is not needed to expense for the additional production.
The above 12% of profit consists of an assumed proper rate of operating profit of 8% and an assumed rate of operating profit of 4% is expected to be realized by the flight operation of those aircrafts of larger size and longer distance cruising.

The calculated results are shown in Table 6.7.5(4).

Table 6.7.5 (4) Estimate of Incremental Benefit from Passenger Transportation

Akmola	1995	2000	2005	2010	2020
1. Air Passenger Movements (000)					
-Domestic	67.1	113.4	155.0	215.1	369.2
-CIS Intern'l	46.6	57.6	76.7	103.1	164.3
-Foreign Intern'l	40.5	53.9	76.3	105.3	166.4
-Total	154.2	224.9	307.9	423.5	699.8
2. Average Passenger-km					
-Domestic	982.7	839.8	832.4	821.8	799.9
-CIS Intern'l	2319.6	2320.8	2322.0	2324.2	2328.8
-Foreign Intern'l	3279.0	3281.7	3291.4	3296.4	3286.4
3.1 Air Tariff Revenue/Pax(US$)					
-Domestic	68	59	59	58	57
-CIS Intern'l	219	219	219	220	220
-Foreign Intern'l	349	350	350	350	350
3.2 Rail Tariff Revenue/Pax(US$)					
-Domestic	22	19	19	19	19
-CIS Intern'l	47	47	47	47	47
-Foreign Intern'l	-	-	-	-	-
4.1 Difference Between Air Tariff and Rail Tariff ((3.1)-(3.2))					
-Domestic	46.4	39.8	39.5	39.0	37.9
-CIS Intern'l	172.7	172.7	172.8	172.8	173.0
-Foreign Intern'l	349.4	349.5	350.1	350.3	349.8
4.2 Difference of Tariff Revenue(Th.US$)					
-Domestic ((1)*(4.1))	3,117	4,516	6,116	8,385	14,009
-CIS Intern'l((1)*(4.1)*0.5) #	4,024	4,977	6,629	8,907	14,286
-Foreign Intern'l((1)*(4.1)*0.5) #	7,071	9,413	13,347	18,448	29,099
-Total	14,212	18,906	26,092	35,740	57,314
5.1 Difference of Cost between Air and other Mode(0.78*(3.1)-0.9*(3.2)					
-Domestic	16.5	13.7	13.5	13.3	12.9
-CIS Intern'l	92.7	92.7	92.7	92.7	92.8
-Foreign Intern'l	272.5	272.6	273.0	273.3	272.8
5.2 Difference of Total Cost (Th.US$)					
-Domestic ((1)*(5.1))	1,105	1,551	2,096	2,866	4,756
-CIS Intern'l((1)*(5.1)*0.5) #	2,160	2,671	3,557	4,779	7,618
-Foreign Intern'l((1)*(5.1)*0.5) #	5,516	7,342	10,411	14,369	22,697
-Total	8,781	11,564	16,065	22,033	35,071
6. Incremental Revenue (Th.US$)	-	4,694	11,381	21,528	43,102
7. Incremental cost (Th.US$)	-	2,784	7,284	13,253	26,290
8. Incremental Net Benefit(Th.US$)((6)-(7))	-	1,910	4,596	8,275	16,811
Aktau	1995	2000	2005	2010	2020
1. Air Passenger Movements (000)					
-Domestic	185.8	251.4	318.1	404.4	636.9
-CIS Intern'l	68.4	73.7	98.0	132.8	232.5
-Foreigners	35.3	44.1	58.6	76.2	123.8
-Total	281.5	369.1	474.8	613.4	993.2
2. Average Passenger-km					
-Domestic	1519.3	1594.8	1582.1	1567.9	1540.2
-CIS Intern'l	1883.1	1885.0	1888.2	1891.8	1898.2
-Foreigners	2907.7	2882.5	2855.4	2831.6	2790.8
3.1 Air Tariff Revenue/Pax(US$)					
-Domestic	102	107	106	105	104
-CIS Intern'l	197	197	197	198	198
-Foreign Intern'l	328	327	325	324	322
3.2 Rail Tariff Revenue/Pax(US$)					
-Domestic	32	33	33	33	32
-CIS Intern'l	39	39	39	39	39
-Foreign Intern'l	-	-	-	-	-
4.1 Difference Between Air Tariff and Rail Tariff ((3.1)-(3.2))					
-Domestic	70.8	73.9	73.3	72.7	71.5
-CIS Intern'l	158.4	158.5	158.6	158.7	159.0
-Foreign Intern'l	328.4	326.9	325.4	324.0	321.6
4.2 Difference of Tariff Revenue(Th.US$)					
-Domestic ((1)*(4.1))	13,111	18,569	23,326	29,398	45,529
-CIS Intern'l((1)*(4.1)*0.5) #	4,785	5,840	7,774	10,542	18,480
-Foreign Intern'l((1)*(4.1)*0.5) #	5,791	7,206	9,538	12,345	19,902
-Total	23,688	31,615	40,638	52,285	83,910
5.1 Difference of Cost between Air and other Mode(0.78*(3.1)-0.9*(3.2)					
-Domestic	26.4	27.7	27.5	27.2	26.7
-CIS Intern'l	88.8	88.9	88.9	88.9	89.0
-Foreign Intern'l	256.2	255.0	253.8	252.7	250.8
5.2 Difference of Total Cost(Th.US$)					
-Domestic ((1)*(5.1))	4,896	6,958	8,735	11,003	17,019
-CIS Intern'l((1)*(5.1)*0.5) #	2,683	3,274	4,357	5,986	10,346
-Foreign Intern'l((1)*(5.1)*0.5) #	4,517	5,621	7,439	9,629	15,523
-Total	12,097	15,852	20,532	26,538	42,889
6. Incremental Revenue (Th.US$)	-	7,928	16,950	28,597	60,222
7. Incremental cost (Th.US$)	-	3,756	8,435	14,441	30,792
8. Incremental Net Benefit(Th.US$)((6)-(7))	-	4,172	8,515	14,156	29,430

: Coefficient 0.5 means assumed share of the Kazakhstan airlines.

Aktyubinsk	1995	2000	2005	2010	2020
1. Air Passenger Movements (000)					
-Domestic	58.4	65.8	85.7	115.4	198.7
-CIS Intern'l	14.0	17.7	23.5	32.5	57.7
-Foreigners	4.8	6.3	8.2	10.7	17.0
-Total	69.2	89.9	117.4	158.6	273.4
2. Average Passenger-km					
-Domestic	1568.0	1533.3	1499.6	1457.5	1380.5
-CIS Intern'l	1517.6	1523.3	1531.1	1541.2	1555.7
-Foreigners	2739.8	2729.1	2697.5	2674.4	2640.1
3.1 Air Tariff Revenue/Pax(US$)					
-Domestic	105	103	101	99	94
-CIS Intern'l	176	177	177	178	179
-Foreign Intern'l	319	318	316	315	312
3.2 Rail Tariff Revenue/Pax(US$)					
-Domestic	33	32	32	31	29
-CIS Intern'l	32	32	32	32	33
-Foreign Intern'l	-	-	-	-	-
4.1 Difference Between Air Tariff and Rail Tariff ((3.1)-(3.2))					
-Domestic	72.7	71.2	69.7	67.8	64.4
-CIS Intern'l	144.5	144.7	145.0	145.4	146.0
-Foreign Intern'l	318.5	317.9	316.0	314.6	312.5
4.2 Difference of Tariff Revenue(Th.US$)					
-Domestic ((1)*(4.1))	3,664	4,684	5,972	7,829	12,801
-CIS Intern'l((1)*(4.1)*0.5) #	1,011	1,282	1,707	2,362	4,211
-Foreign Intern'l((1)*(4.1)*0.5) #	770	1,008	1,299	1,688	2,664
-Total	5,446	6,974	8,977	11,879	19,676
5.1 Difference of Cost between Air and other Mode(0.78*(3.1)-0.9*(3.2)					
-Domestic	27.2	26.6	26.0	25.3	23.9
-CIS Intern'l	84.0	84.1	84.2	84.4	84.6
-Foreign Intern'l	248.4	247.9	246.5	245.4	243.7
5.2 Difference of Total Cost (Th.US$)					
-Domestic ((1)*(5.1))	1,371	1,750	2,228	2,914	4,743
-CIS Intern'l((1)*(5.1)*0.5) #	588	745	991	1,371	2,448
-Foreign Intern'l((1)*(5.1)*0.5) #	681	786	1,013	1,317	2,078
-Total	2,561	3,282	4,232	5,602	9,261
6. Incremental Revenue (Th.US$)	-	1,528	3,531	6,433	14,230
7. Incremental cost (Th.US$)	-	721	1,672	3,041	6,701
8. Incremental Net Benefit(Th.US$)((6)-(7))	-	807	1,860	3,392	7,529
Almaty	1995	2000	2005	2010	2020
1. Air Passenger Movements (000)					
-Domestic	710.6	890.4	1138.9	1474.0	2354.4
-CIS Intern'l	598.4	713.6	857.2	1027.4	1414.2
-Foreigners	305.8	404.0	522.1	662.6	1006.2
-Total	1614.8	2007.9	2518.2	3164.0	4774.9
2. Average Passenger-km					
-Domestic	1076.8	1062.2	1059.7	1056.3	1050.2
-CIS Intern'l	3143.3	3141.1	3137.7	3133.3	3124.9
-Foreigners	3362.1	3366.1	3364.7	3361.8	3350.8
3.1 Air Tariff Revenue/Pax(US$)					
-Domestic	74	74	73	73	73
-CIS Intern'l	257	256	256	256	256
-Foreign Intern'l	354	354	354	354	353
3.2 Rail Tariff Revenue/Pax(US$)					
-Domestic	24	23	23	23	23
-CIS Intern'l	62	62	62	62	62
-Foreign Intern'l	-	-	-	-	-
4.1 Difference Between Air Tariff and Rail Tariff ((3.1)-(3.2))					
-Domestic	50.8	50.1	50.0	49.8	49.5
-CIS Intern'l	194.6	194.6	194.5	194.4	194.2
-Foreign Intern'l	353.9	354.1	354.1	353.9	353.3
4.2 Difference of Tariff Revenue(Th.US$)					
-Domestic ((1)*(4.1))	36,070	44,600	56,919	73,439	116,650
-CIS Intern'l((1)*(4.1)*0.5) #	58,234	69,426	83,358	99,866	137,321
-Foreign Intern'l((1)*(4.1)*0.5) #	54,106	71,528	92,433	117,223	177,750
-Total	148,410	185,554	232,710	290,528	431,721
5.1 Difference of Cost between Air and other Mode(0.78*(3.1)-0.9*(3.2)					
-Domestic	18.3	18.0	17.9	17.9	17.8
-CIS Intern'l	96.1	96.1	96.1	96.1	96.1
-Foreign Intern'l	276.1	276.2	276.2	276.0	275.6
5.2 Difference of Total Cost (Th.US$)					
-Domestic ((1)*(5.1))	12,981	16,018	20,435	26,353	41,821
-CIS Intern'l((1)*(5.1)*0.5) #	28,752	34,286	41,182	49,359	67,930
-Foreign Intern'l((1)*(5.1)*0.5) #	42,203	55,792	72,097	91,434	138,645
-Total	83,936	106,096	133,714	167,146	248,396
6. Incremental Revenue (Th.US$)	-	37,146	84,300	142,118	283,311
7. Incremental cost (Th.US$)	-	22,160	49,777	83,209	164,460
8. Incremental Net Benefit(Th.US$)((6)-(7))	-	14,984	34,523	58,909	118,851

: Coefficient 0.5 means assumed share of the Kazakhstan airlines.

Atyrau	1995	2000	2005	2010	2020
1. Air Passenger Movements (000)					
-Domestic	101.8	144.6	187.0	243.9	402.5
-CIS Intern'l	43.4	53.1	67.9	87.6	140.3
-Foreigners	16.1	21.1	27.9	36.3	58.9
-Total	161.3	218.8	282.8	367.8	601.7
2. Average Passenger-km					
-Domestic	1104.1	1205.3	1200.0	1194.9	1188.7
-CIS Intern'l	1555.6	1557.3	1560.0	1564.0	1571.3
-Foreigners	3626.1	3611.0	3600.8	3587.8	3562.3
3.1 Air Tariff Revenue/Pax(US$)					
-Domestic	76	83	82	82	81
-CIS Intern'l	179	179	179	179	180
-Foreign Intern'l	368	367	367	366	365
3.2 Rail Tariff Revenue/Pax(US$)					
-Domestic	24	26	26	26	26
-CIS Intern'l	33	33	33	33	33
-Foreign Intern'l	-	-	-	-	-
4.1 Difference Between Air Tariff and Rail Tariff ((3.1)-(3.2))					
-Domestic	52.0	56.6	56.3	56.1	55.5
-CIS Intern'l	146.0	146.1	146.2	146.4	148.7
-Foreign Intern'l	368.0	367.2	366.6	366.0	364.6
4.2 Difference of Tariff Revenue(Th.US$)					
-Domestic ((1)*(4.1))	5,606	8,183	10,537	13,686	22,327
-CIS Intern'l((1)*(4.1)*0.5) #	3,169	3,878	4,961	6,411	10,291
-Foreign Intern'l((1)*(4.1)*0.5) #	2,954	3,865	5,123	6,645	10,737
-Total	11,729	15,926	20,620	26,742	43,355
5.1 Difference of Cost between Air and other Mode(0.78*(3.1)-0.9*(3.2)					
-Domestic	18.8	20.7	20.6	20.5	20.2
-CIS Intern'l	84.6	84.6	84.7	84.7	84.8
-Foreign Intern'l	287.0	286.4	286.0	285.4	284.4
5.2 Difference of Total Cost (Th.US$)					
-Domestic ((1)*(5.1))	2,025	2,990	3,848	4,995	8,136
-CIS Intern'l((1)*(5.1)*0.5) #	1,836	2,246	2,873	3,712	5,954
-Foreign Intern'l((1)*(5.1)*0.5) #	2,304	3,015	3,996	5,183	8,375
-Total	6,165	8,251	10,716	13,889	22,465
6. Incremental Revenue (Th.US$)	-	4,197	8,891	15,013	31,626
7. Incremental cost (Th.US$)	-	2,086	4,551	7,724	16,300
8. Incremental Net Benefit(Th.US$)((6)-(7))	-	2,111	4,340	7,289	15,326
Pavlodar	1995	2000	2005	2010	2020
1. Air Passenger Movements (000)					
-Domestic	97.7	184.2	243.0	327.9	572.4
-CIS Intern'l	58.0	60.5	77.0	99.6	159.0
-Foreigners	9.6	12.3	16.0	20.5	32.3
-Total	157.3	257.0	336.0	448.0	763.8
2. Average Passenger-km					
-Domestic	1081.7	1117.1	1105.2	1089.5	1062.5
-CIS Intern'l	2534.8	2535.5	2537.6	2540.1	2544.5
-Foreigners	3265.5	3247.4	3229.0	3200.8	3151.2
3.1 Air Tariff Revenue/Pax(US$)					
-Domestic	75	77	76	75	74
-CIS Intern'l	230	230	230	230	230
-Foreign Intern'l	349	348	347	345	342
3.2 Rail Tariff Revenue/Pax(US$)					
-Domestic	24	24	24	24	23
-CIS Intern'l	51	51	51	51	51
-Foreign Intern'l	-	-	-	-	-
4.1 Difference Between Air Tariff and Rail Tariff ((3.1)-(3.2))					
-Domestic	51.0	52.6	52.1	51.3	50.1
-CIS Intern'l	179.0	179.0	179.1	179.1	179.2
-Foreign Intern'l	348.6	347.6	346.6	345.1	342.3
4.2 Difference of Tariff Revenue(Th.US$)					
-Domestic ((1)*(4.1))	4,981	9,687	12,649	16,834	28,682
-CIS Intern'l((1)*(4.1)*0.5) #	4,474	5,418	6,897	8,916	14,252
-Foreign Intern'l((1)*(4.1)*0.5) #	1,669	2,132	2,770	3,544	5,533
-Total	11,124	17,237	22,316	29,294	48,467
5.1 Difference of Cost between Air and other Mode(0.78*(3.1)-0.9*(3.2)					
-Domestic	18.4	19.8	18.8	18.5	18.0
-CIS Intern'l	94.0	94.0	94.0	94.0	94.1
-Foreign Intern'l	271.9	271.2	270.4	269.2	267.0
5.2 Difference of Total Cost (Th.US$)					
-Domestic ((1)*(5.1))	1,794	3,584	4,569	6,069	10,301
-CIS Intern'l((1)*(5.1)*0.5) #	2,350	2,846	3,622	4,681	7,479
-Foreign Intern'l((1)*(5.1)*0.5) #	1,302	1,663	2,161	2,764	4,316
-Total	5,446	8,013	10,352	13,514	22,096
6. Incremental Revenue (Th.US$)	-	6,113	11,192	18,170	37,342
7. Incremental cost (Th.US$)	-	2,567	4,906	8,068	16,650
8. Incremental Net Benefit(Th.US$)((6)-(7))	-	3,545	6,286	10,102	20,692

: Coefficient 0.5 means assumed share of the Kazakhstan airlines.

(2.2) Incremental net benefit of air cargo transportation

The incremental net benefit for air cargo is quantified by the formula (6.7.5(8))~ (6.7.5(12))

NBC = (IDGR - IDGC) + (IIGR-IIGC) ---------- (6.7.5(8))

where, NBC : Incremental net benefit for the domestic(CIS) and international(foreign) air cargo. (Thousand US$)
IDGR : Incremental revenue for the domestic(CIS) air cargo earned by Kazakhstan airlines. (Thousand US$)
IDGC : Incremental cost for the domestic(CIS) air cargo expensed by Kazakhstan airlines.(Thousand US$)
IIGR : Incremental revenue for the international air cargo earned by Kazakhstan airlines. (Thousand US$)
IIGC : Incremental cost for the international(foreign) air cargo expensed by Kazakhstan airlines.(Thousand US$)

IDGR = IDG • AVGR ---------- (6.7.5(9))

where, IDG : Incremental domestic(CIS) air cargo ton carried by Kazakhstan aircraft(Thousand).
AVGR : Average domestic tariff revenue per cargo ton(US$)

IDGC = IDG • AVGE ---------- (6.7.(10))

where, AVGE : Average direct operating expense per cargo ton. (US$/Ton)

IIGR = IIG • AVG ---------- (6.7.(11))

where, IIG : Incremental international(foreign) cargo ton(thousand)
AVG : Average tariff revenue per international air cargo ton.

IDGC = IIG • AVGE ---------- (6.7.(12))

where, AVGE : Average direct operating expense per cargo ton.

The calculated results are shown in Table 6.7.5(5).

Table 6.7.5 (5) Estimate of Incremental Benefit from Air Cargo Transportation

Akmola	1995	2000	2005	2010	2020
1. Estimated Air Cargo Ton					
-Domestic	318	521	710	982	1675
-CIS Intern'l	189	233	311	417	655
-Foreigners	1879	2539	3661	5130	8216
-Total	2,385	3,293	4,682	6,529	10,557
2. Average Ton-km					
-Domestic	970.2	851.3	842.7	833.8	812.6
-CIS Intern'l	2313.3	2318.6	2317.2	2323.8	2328.2
-Foreigners	3647.8	3625.4	3599.7	3579.3	3543.8
3. Air Cargo Tariff Revenue/Ton (US$)					
-Domestic	412	377	374	371	365
-CIS Intern'l	750	752	751	753	754
-Foreign Intern'l	1027	1023	1018	1014	1007
4. Air Cargo Tariff Revenue(Th.US$)					
-Domestic ((1)*(3))(Th.US$)	131	196	266	365	611
-CIS Intern'l((1)*(3)*0.5) #	119	196	267	370	631
-Foreign Intern'l((1)*(3)*0.5) #	97	119	158	211	335
-Total	347	511	690	946	1,578
5. Incremental Revenue by this Project(Th.US$)	-	164	343	599	1,230
6. Incremental cost by this project ((6)*0.78)(Th.US$)	-	128	268	467	960
7. Incremental Net Benefit (Th.US$) (5)-(6)	-	36	75	132	271

Aktau	1995	2000	2005	2010	2020
1. Estimated Air Cargo Ton					
-Domestic	814	1087	1374	1746	2745
-CIS Intern'l	405	494	657	891	1559
-Foreigners	1663	2095	2813	3679	6039
-Total	2,882	3,676	4,845	6,316	10,344
2. Average Ton-km					
-Domestic	1771.3	1802.8	1786.4	1769.2	1735.6
-CIS Intern'l	1882.9	1884.4	1887.1	1892.9	1899.8
-Foreigners	2854.2	2821.1	2793.1	2767.8	2723.9
3. Air Cargo Tariff Revenue/Ton (US$)					
-Domestic	624	632	628	624	616
-CIS Intern'l	651	652	652	654	655
-Foreign Intern'l	867	860	854	849	840
4. Air Cargo Tariff Revenue(Th.US$)					
-Domestic ((1)*(3))(Th.US$)	508	687	863	1,089	1,690
-CIS Intern'l((1)*(3)*0.5) #	265	354	448	570	899
-Foreign Intern'l((1)*(3)*0.5) #	176	213	281	378	655
-Total	949	1,254	1,592	2,038	3,244
5. Incremental Revenue by this Project(Th.US$)	-	305	643	1,089	2,295
6. Incremental cost by this project ((6)*0.78)(Th.US$)	-	238	502	849	1,790
7. Incremental Net Benefit (5)-(6)	-	67	142	240	505

Aktyubinsk	1995	2000	2005	2010	2020
1. Estimated Air Cargo Ton					
-Domestic	250	324	420	561	951
-CIS Intern'l	117	148	196	270	480
-Foreigners	227	302	393	516	824
-Total	593	774	1,009	1,347	2,256
2. Average Ton-km					
-Domestic	1541.1	1513.9	1483.6	1452.9	1380.7
-CIS Intern'l	1518.8	1530.0	1533.9	1543.2	1555.6
-Foreigners	2752.2	2722.8	2714.2	2679.9	2635.6
3. Air Cargo Tariff Revenue/Ton (US$)					
-Domestic	567	560	553	545	526
-CIS Intern'l	560	564	565	568	571
-Foreign Intern'l	846	840	838	830	821
4. Air Cargo Tariff Revenue(Th.US$)					
-Domestic ((1)*(3))(Th.US$)	142	182	232	305	500
-CIS Intern'l((1)*(3)*0.5) #	70	92	119	159	272
-Foreign Intern'l((1)*(3)*0.5) #	49	62	82	112	197
-Total	261	335	433	577	969
5. Incremental Revenue by this Project(Th.US$)	-	75	172	316	708
6. Incremental cost by this project ((6)*0.78)(Th.US$)	-	58	134	247	553
7. Incremental Net Benefit (5)-(6)	-	16	38	70	156

: Coefficient 0.5 means assumed share of the Kazakhstan airlines.

Almaty	1995	2000	2005	2010	2020
1. Estimated Air Cargo Ton					
-Domestic	3169	3966	5052	6542	10418
-CIS Intern'l	2897	3454	4149	4974	6846
-Foreigners	14290	19186	25117	32208	49682
-Total	20355	26606	34328	43724	66945
2. Average Ton-km					
-Domestic	1113.7	1096.8	1095.0	1090.7	1083.7
-CIS Intern'l	3144.5	3141.9	3137.7	3133.1	3124.9
-Foreigners	3858.1	3821.6	3787.6	3756.5	3706.5
3. Air Cargo Tariff Revenue/Ton (US$)					
-Domestic	453	449	448	447	445
-CIS Intern'l	927	927	926	925	923
-Foreign Intern'l	1068	1061	1054	1048	1038
4. Air Cargo Tariff Revenue(Th.US$)					
-Domestic ((1)*(3))(Th.US$)	1,437	1,779	2,269	2,924	4,636
-CIS Intern'l((1)*(3)*0.5) ※	1,469	1,837	2,343	3,025	4,809
-Foreign Intern'l((1)*(3)*0.5) ※	1,546	1,832	2,187	2,606	3,555
-Total	4,452	5,449	6,798	8,556	12,999
5. Incremental Revenue by this Project(Th.US$)	-	997	2,346	4,104	8,547
6. Incremental cost by this project ((6)*0.78)(Th.US$)	-	777	1,830	3,201	6,667
7. Incremental Net Benefit (5)-(6)	-	219	516	903	1,880

Atyrau	1995	2000	2005	2010	2020
1. Estimated Air Cargo Ton					
-Domestic	607	805	1037	1344	2193
-CIS Intern'l	91	111	142	184	294
-Foreigners	741	987	1329	1746	2882
-Total	1439	1903	2508	3274	5370
2. Average Ton-km					
-Domestic	976.8	1090.7	1088.5	1085.0	1077.2
-CIS Intern'l	1576.0	1554.3	1557.1	1569.0	1576.7
-Foreigners	3779.0	3745.2	3719.9	3700.8	3658.5
3. Air Cargo Tariff Revenue/Ton (US$)					
-Domestic	414	447	446	445	443
-CIS Intern'l	576	571	571	574	576
-Foreign Intern'l	1052	1046	1041	1037	1029
4. Air Cargo Tariff Revenue(Th.US$)					
-Domestic ((1)*(3))(Th.US$)	251	360	463	598	972
-CIS Intern'l((1)*(3)*0.5) ※	175	230	296	386	632
-Foreign Intern'l((1)*(3)*0.5) ※	48	58	74	95	151
-Total	474	648	833	1,080	1,755
5. Incremental Revenue by this Project(Th.US$)	-	174	359	605	1,281
6. Incremental cost by this project ((6)*0.78)(Th.US$)	-	135	280	472	999
7. Incremental Net Benefit (5)-(6)	-	38	79	133	282

Pavlodar	1995	2000	2005	2010	2020
1. Estimated Air Cargo Ton					
-Domestic	470	934	1230	1655	2877
-CIS Intern'l	115	139	177	229	366
-Foreigners	449	578	754	964	1505
-Total	1034	1651	2161	2848	4747
2. Average Ton-km					
-Domestic	1083.2	1161.9	1149.4	1131.4	1108.9
-CIS Intern'l	2552.1	2549.0	2548.1	2537.9	2544.4
-Foreigners	3675.2	3652.1	3615.1	3592.4	3554.3
3. Air Cargo Tariff Revenue/Ton (US$)					
-Domestic	445	467	463	458	450
-CIS Intern'l	803	802	802	800	801
-Foreign Intern'l	1032	1028	1021	1016	1009
4. Air Cargo Tariff Revenue(Th.US$)					
-Domestic ((1)*(3))(Th.US$)	209	436	570	759	1,294
-CIS Intern'l((1)*(3)*0.5) ※	189	375	493	662	1,153
-Foreign Intern'l((1)*(3)*0.5) ※	59	72	90	116	185
-Total	457	883	1,154	1,537	2,631
5. Incremental Revenue by this Project(Th.US$)	-	425	696	1,080	2,174
6. Incremental cost by this project ((6)*0.78)(Th.US$)	-	332	543	842	1,696
7. Incremental Net Benefit					
8. Incremental Net Benefit(Th.US$)((6)-(7))	-	94	153	238	478

※ : Coefficient 0.5 means assumed share of the Kazakhstan airlines.

(3) Incremental Net Benefit brought about in Tourism Industry.

The incremental benefit brought about in the tourism industry is quantified by the following formula (6.7.5(13).

$$NBTI = MLP \cdot AVEX \cdot IFVT \quad \text{----------} \quad (6.7.5(13))$$

where, NBTI : Net benefit brought about by the expenditure of the incremental inter-CIS and foreign visitors. (thousand US$)
IFVT : Incremental number of foreign visitors(thousand)
AVEX : Average expenditure per foreign visitor(US$)
MLP : "multiplier" as defined in the beforementioned in Note 6.7.4(2).

The estimated results are shown in Table 6.7.5(6).

(4) Incremental Net Benefit Brought About in Fuel supplying Industry

The incremental net benefit generated by the selling of the aircraft fuel is quantified by the formula (6.7.5(14)) and formula(6.7.5(15)).

$$NBEXC = UPRC \cdot INFEL \cdot \{1 - 1/(1 + EXCRT)\} \quad \text{----------} \quad (6.7.5(14))$$

where, NBEXC : Net benefit of VAT tax paid on the aircraft fuel consumed by the incremental flight accompanied by the project implementation (Thousand US$).
TXR : VAT tax rate is set as 20% of the production price.
UPRC : Buying or selling unit price: assumed uniformly as US$250.
INFEL : Incremental quantity of fuel consumed accompanied by the project implementation (See Appendix-6.7.5(2)).

In addition this study counts in the proper margin included in the fuel sales by the application of the formula(6.7.5.(15)).

$$NBPMGN = (UPRC \cdot INFEL - VATVL) \cdot (1 - 1/(1+MGRT)) \quad \text{-} \quad (6.7.5(15))$$

where, NBPMGN : Incremental proper margin(profit) accompanied by selling of the aircraft fuel(Thousand US$).
VATVL : Incremental amount of VAT tax which is obtained by the previous formula.
MGRT : Rate of proper margin(10%)

The calculated results are shown in Table 6.7.5(7).

Table 6.7.5 (6) Estimated Multiplier Effects of Foreign Currency

	1995	2000	2005	2010	2020
Akmola					
1. Intern'l Pax Movements					
-CIS Intern'l	46.6	57.6	76.7	103.1	164.3
-Foreigners	40.5	53.9	76.3	105.3	166.4
(CIS + Foreign)(000)	87.1	111.5	153.0	208.4	330.7
2. No. of Intern'L Pax					
((1)/2)*0.5 #	21.8	27.9	38.3	52.1	82.7
3. Foreign Currency(Th.US$)					
((2)* US$57.3)	1247.7	1597.2	2191.7	2985.3	4737.3
4. Multiplier Benefit					
((3)*0.5)(Th.US$)	623.9	798.6	1095.9	1492.7	2368.6
5. Iccremental Benefit (Th.US$)	-	174.8	472.0	868.8	1,744.8
Aktau					
1. Intern'l Pax Movements					
-CIS Intern'l	60.4	73.7	98.0	132.8	232.5
-Foreigners	35.3	44.1	58.6	76.2	123.8
(CIS + Foreign)(000)	95.7	117.8	156.6	209.0	356.3
2. No. of Intern'L Pax					
((1)/2)*0.5 #	23.9	29.5	39.2	52.3	89.1
3. Foreign Currency(Th.US$)					
((2)* US$57.3)	1370.9	1687.5	2243.3	2993.9	5104.0
4. Multiplier Benefit					
((3)*0.5)(Th.US$)	685.5	843.7	1121.6	1497.0	2552.0
5. Iccremental Benefit (Th.US$)	-	158.3	436.2	811.5	1,866.5
Aktyubinsk					
1. Intern'l Pax Movements					
-CIS Intern'l	14.0	17.7	23.5	32.5	57.7
-Foreigners	4.8	6.3	8.2	10.7	17.0
(CIS + Foreign)(000)	18.8	24.0	31.7	43.2	74.7
2. No. of Intern'L Pax					
((1)/2)*0.5 #	4.7	6.0	7.9	10.8	18.7
3. Foreign Currency(Th.US$)					
((2)* US$57.3)	269.3	343.8	454.1	618.8	1070.1
4. Multiplier Benefit					
((3)*0.5)(Th.US$)	134.7	171.9	227.1	309.4	535.0
5. Iccremental Benefit (Th.US$)	-	37.2	92.4	174.8	400.4

Almaty					
1. Intern'l Pax Movements					
-CIS Intern'l	598.4	713.6	857.2	1027.4	1414.2
-Foreigners	385.8	404.0	522.1	662.6	1006.2
(CIS + Foreign)(000)	984.2	1117.6	1379.3	1690.0	2420.4
2. No. of Intern'L Pax					
((1)/2)*0.5 #	226.1	279.4	344.8	422.5	605.1
3. Foreign Currency(Th.US$)					
((2)* US$57.3)	12952.7	16009.6	19758.5	24209.3	34672.2
4. Multiplier Benefit					
((3)*0.5)(Th.US$)	6476.3	8004.8	9879.2	12104.6	17336.1
5. Iccremental Benefit (Th.US$)	-	1,528.5	3,402.9	5,628.3	10,859.8
Atyrau					
1. Intern'l Pax Movements					
-CIS Intern'l	43.4	53.1	67.9	87.6	140.3
-Foreigners	16.1	21.1	27.9	36.3	58.9
(CIS + Foreign)(000)	59.5	74.2	95.8	123.9	199.2
2. No. of Intern'L Pax					
((1)/2)*0.5 #	14.9	18.6	24.0	31.0	49.8
3. Foreign Currency(Th.US$)					
((2)* US$57.3)	852.3	1062.9	1372.3	1774.9	2853.5
4. Multiplier Benefit					
((3)*0.5)(Th.US$)	426.2	531.5	686.2	887.4	1426.8
5. Iccremental Benefit (Th.US$)	-	105.3	260.0	461.3	1,000.6
Pavlodar					
1. Intern'l Pax Movements					
-CIS Intern'l	50.0	60.5	77.0	99.8	159.0
-Foreigners	9.6	12.3	16.0	20.5	32.3
(CIS + Foreign)(000)	20.0	24.2	30.8	39.9	63.6
2. No. of Intern'L Pax					
((1)/2)*0.5 #	5.0	6.1	7.7	10.0	15.9
3. Foreign Currency(Th.US$)					
((2)* US$57.3)	286.5	346.7	441.2	571.9	911.1
4. Multiplier Benefit					
((3)*0.5)(Th.US$)	143.3	173.3	220.6	285.9	455.5
5. Iccremental Benefit (Th.US$)	-	30.1	77.4	142.7	312.3

: Coefficient of 0.5 means assumed component ratio of non-Kazakhstan.

Table 6.7.5 (7) Estimate of Incremental Fuel Tax and Proper Margin

Airport	1995	2000	2005	2010	2020
Akmola					
1. Annual consumption(000kl)			73		206
2. Sales amount(Thousand US$)			18,228		51,390
3. Tax amount(Thousand US$)	378	1,708	3,038	5,802	8,565
4. Proper Margin(10%)	172	776	1,381	2,637	3,893
5. (3)+(4)	550	2,485	4,419	8,439	12,458
Incremental Revenue (Th.US$)	-	1,934	3,869	7,888	11,908
Aktau					
1. Annual consumption(000kl)			23		60
2. Sales amount(Thousand US$)			5,794		14,921
3. Tax amount(Thousand US$)	558	762	966	1,726	2,487
4. Proper Margin(10%)	254	346	439	785	1,130
5. (3)+(4)	812	1,108	1,405	2,511	3,617
Incremental Revenue (Th.US$)	-	296	592	1,699	2,805
Aktyubinsk					
1. Annual consumption(000kl)			5		17
2. Sales amount(Thousand US$)			1,274		4,146
3. Tax amount(Thousand US$)	125	169	212	452	691
4. Proper Margin(10%)	57	77	97	205	314
5. (3)+(4)	182	245	309	657	1,005
Incremental Revenue (Th.US$)	-	63	127	475	823
Almaty					
1. Annual consumption(000kl)			386		501
2. Sales amount(Thousand US$)			96,493		125,125
3. Tax amount(Thousand US$)	5,490	10,786	16,082	18,468	20,854
4. Proper Margin(10%)	2,495	4,903	7,310	8,395	9,479
5. (3)+(4)	7,985	15,689	23,392	26,863	30,333
Incremental Revenue (Th.US$)	-	7,703	15,407	18,878	22,348
Atyrau					
1. Annual consumption(000kl)			12		26
2. Sales amount(Thousand US$)			3,077		6,575
3. Tax amount(Thousand US$)	303	408	513	804	1,096
4. Proper Margin(10%)	138	185	233	366	498
5. (3)+(4)	440	593	746	1,170	1,594
Incremental Revenue (Th.US$)	-	153	306	730	1,154
Pavlodar					
1. Annual consumption(000kl)			14		39
2. Sales amount(Thousand US$)			3,376		9,642
3. Tax amount(Thousand US$)	263	413	563	1,085	1,607
4. Proper Margin(10%)	120	188	256	493	730
5. (3)+(4)	382	600	818	1,578	2,337
Incremental Revenue (Th.US$)	-	150	300	822	1,344

Note: Unit price of fuel is uniformly assumed to be US$250 though it differs among prices for domestic,CIS and Foreign

(5) Summary of Incremental Net Benefits by Category

Summary of incremental net benefits by category are shown in Table 6.7.5(8) and Table 6.7.5(9).

Table 6.7.5 (8) Summary of Incremental Benefit by Sector

Akmola	In Thousand US Dollars					In Million Tenge				
	1995	2000	2005	2010	2020	1995	2000	2005	2010	2020
1. Airport Sector	-	6,418	12,836	27,587	42,339	-	451.2	902.4	1939.4	2976.4
2. Transport Sector	-	1,946	4,672	8,407	17,082	-	136.8	328.4	591.0	1200.9
3. Tourism Sector	-	175	472	869	1,745	-	12.3	33.2	61.1	122.7
4. Fuel Supply	-	1,934	3,869	7,888	11,908	-	136.0	272.0	554.6	837.1
Total	-	10,474	21,849	44,752	73,074	-	736.3	1536.0	3146.0	5137.1

Aktau	In Thousand US Dollars					In Million Tenge				
	1995	2000	2005	2010	2020	1995	2000	2005	2010	2020
1. Airport Sector	-	1,028	2,056	5,632	9,209	-	72.3	144.5	396.0	647.4
2. Transport Sector	-	4,239	8,657	14,396	29,935	-	298.0	608.6	1012.0	2104.5
3. Tourism Sector	-	158	436	812	1,867	-	11.1	30.7	57.0	131.2
4. Fuel Supply	-	296	592	1,699	2,805	-	20.8	41.7	119.4	197.2
Total	-	5,722	11,742	22,539	43,815	-	402.2	825.4	1584.5	3080.2

Aktyubinsk	In Thousand US Dollars					In Million Tenge				
	1995	2000	2005	2010	2020	1995	2000	2005	2010	2020
1. Airport Sector	-	197	394	1,975	3,556	-	13.8	27.7	138.8	250.0
2. Transport Sector	-	823	1,897	3,461	7,685	-	57.9	133.4	243.3	540.3
3. Tourism Sector	-	37	92	175	400	-	2.6	6.5	12.3	28.1
4. Fuel Supply	-	63	127	475	823	-	4.5	8.9	33.4	57.8
Total	-	1,121	2,510	6,086	12,465	-	78.8	176.5	427.8	876.3

Almaty	In Thousand US Dollars					In Million Tenge				
	1995	2000	2005	2010	2020	1995	2000	2005	2010	2020
1. Airport Sector	-	22,042	44,083	56,460	68,838	-	1549.5	3099.0	3969.2	4839.3
2. Transport Sector	-	15,204	35,039	59,812	128,732	-	1068.8	2463.3	4204.8	8487.4
3. Tourism Sector	-	1,528	3,403	5,628	10,860	-	107.5	239.2	395.7	763.4
4. Fuel Supply	-	7,703	15,407	18,878	22,348	-	541.6	1083.1	1327.1	1571.1
Total	-	46,477	97,932	140,778	222,777	-	3267.4	6884.6	9896.7	15661.2

Atyrau	In Thousand US Dollars					In Million Tenge				
	1995	2000	2005	2010	2020	1995	2000	2005	2010	2020
1. Airport Sector	-	597	1,193	3,147	5,101	-	41.9	83.9	221.3	358.6
2. Transport Sector	-	2,150	4,419	7,422	15,608	-	151.1	310.7	521.8	1097.3
3. Tourism Sector	-	105	268	461	1,021	-	7.4	18.3	32.4	70.3
4. Fuel Supply	-	153	306	730	1,154	-	10.7	21.5	51.3	81.1
Total	-	3,004	6,178	11,760	22,864	-	211.2	434.3	826.7	1607.3

Pavlodar	In Thousand US Dollars					In Million Tenge				
	1995	2000	2005	2010	2020	1995	2000	2005	2010	2020
1. Airport Sector	-	890	1,780	4,248	6,716	-	62.6	125.1	298.6	472.1
2. Transport Sector	-	3,639	6,439	10,339	21,170	-	255.8	452.7	726.8	1488.3
3. Tourism Sector	-	30	77	143	312	-	2.1	5.4	10.0	22.0
4. Fuel Supply	-	150	300	822	1,344	-	10.5	21.1	57.8	94.5
Total	-	4,709	8,596	15,552	29,542	-	331.0	604.3	1093.3	2076.8

Table 6.7.5 (9) Summary of Incremental Benefits

Aknole	1995	2000	2005	2010	2020
A. In US Dollars(Thousand)					
1. Airport Sector	-	6,418	12,836	27,587	42,339
1.1 Airport Facility Fees including Terminal Fee and Navigation Fee	-	4,972	9,944	20,474	31,003
1.2 Air Passenger Fee	-	1,446	2,892	7,114	11,336
2. Air Transportation Sector	-	1,946	4,672	8,407	17,082
2.1 Air Ppassenger Transportation	-	1,910	4,596	8,275	16,811
2.2 Air Cargo Transportation	-	36	75	132	271
3. Tourism Industry Sector	-	175	472	869	1,745
4. Aircraft Fuel Supply Sector	-	1,934	3,869	7,888	11,908
Grand Total	-	10,474	21,849	44,752	73,074
B. Grand Total In Tenge(Million)	-	736	1,536	3,146	5,137
Aktau	1995	2000	2005	2010	2020
A. In US Dollars(Thousand)					
1. Airport Sector	-	1,028	2,056	5,632	9,209
1.1 Airport Facility Fees including Terminal Fee and Navigation Fee	-	782	1,563	4,260	6,956
1.2 Air Passenger Fee	-	246	493	1,372	2,252
2. Air Transportation Sector	-	4,239	8,657	14,396	29,935
2.1 Air Ppassenger Transportation	-	4,172	8,515	14,156	29,430
2.2 Air Cargo Transportation	-	67	142	240	505
3. Tourism Industry Sector	-	158	436	812	1,867
4. Aircraft Fuel Supply Sector	-	296	592	1,699	2,805
Grand Total	-	5,722	11,742	22,539	43,815
B. Grand Total In Tenge(Million)		402	825	1,584	3,080
Aktyubinsk	1995	2000	2005	2010	2020
A. In US Dollars(Thousand)					
1. Airport Sector	-	197	394	1,975	3,556
1.1 Airport Facility Fees including Terminal Fee and Navigation Fee	-	149	298	1,559	2,821
1.2 Air Passenger Fee	-	48	96	416	736
2. Air Transportation Sector		823	1,897	3,461	7,685
2.1 Air Ppassenger Transportation	-	807	1,868	3,392	7,529
2.2 Air Cargo Transportation	-	16	38	70	156
3. Tourism Industry Sector	-	37	92	175	400
4. Aircraft Fuel Supply Sector	-	63	127	475	823
Grand Total	-	1,121	2,510	6,086	12,465
B. Grand Total In Tenge(Million)		79	176	428	876
Almaty	1995	2000	2005	2010	2020
A. In US Dollars(Thousand)					
1. Airport Sector	-	22,042	44,083	56,460	68,838
1.1 Airport Facility Fees including Terminal Fee and Navigation Fee	-	16,433	32,865	41,978	51,091
1.2 Air Passenger Fee	-	5,609	11,218	14,483	17,747
2. Air Transportation Sector	-	15,204	35,039	59,812	120,732
2.1 Air Ppassenger Transportation	-	14,984	34,523	58,909	118,851
2.2 Air Cargo Transportation	-	219	516	903	1,880
3. Tourism Industry Sector	-	1,528	3,403	5,628	10,860
4. Aircraft Fuel Supply Sector	-	7,703	15,407	18,878	22,348
Grand Total	-	46,477	97,932	140,778	222,777
B. Grand Total In Tenge(Million)		3,267	6,885	9,897	15,661
Atyrau	1995	2000	2005	2010	2020
A. In US Dollars(Thousand)					
1. Airport Sector	-	597	1,193	3,147	5,101
1.1 Airport Facility Fees including Terminal Fee and Navigation Fee	-	451	902	2,464	4,025
1.2 Air Passenger Fee	-	145	291	683	1,076
2. Air Transportation Sector	-	2,150	4,419	7,422	15,608
2.1 Air Ppassenger Transportation	-	2,111	4,340	7,289	15,326
2.2 Air Cargo Transportation	-	38	79	133	282
3. Tourism Industry Sector	-	185	260	461	1,001
4. Aircraft Fuel Supply Sector	-	153	306	730	1,154
Grand Total	-	3,004	6,178	11,760	22,864
B. Grand Total In Tenge(Million)		211	434	827	1,607
Pavlodar	1995	2000	2000	2000	2000
A. In US Dollars(Thousand)					
1. Airport Sector	-	890	1,780	4,248	6,716
1.1 Airport Facility Fees including Terminal Fee and Navigation Fee	-	670	1,340	3,301	5,262
1.2 Air Passenger Fee	-	220	440	947	1,454
2. Air Transportation Sector	-	3,639	6,439	10,339	21,170
2.1 Air Ppassenger Transportation	-	3,545	6,286	10,102	20,692
2.2 Air Cargo Transportation	-	94	153	238	478
3. Tourism Industry Sector	-	30	77	143	312
4. Aircraft Fuel Supply Sector	-	150	300	822	1,344
Grand Total	-	4,709	8,596	15,552	29,542
B. Grand Total In Tenge(Million)		331	604	1,093	2,077

6.7.6 Cost Estimation (Financial and Economic)

Capital costs classified into local and foreign portions by the year of construction, incremental yearly maintenance costs and incremental personnel costs by six(6) airports are shown in **Appendix-6.7.6 (1)**. Here, it should be noted that the capital costs of the local portion has been converted from market prices to economic prices applying the conversion factor of 82%. Also, the personnel costs have been estimated by the model formulated as on statistics (See **Appendix-6.7.6 (2)**).

6.7.7 Economic and financial Appraisal

Using the foregoing estimated benefits and costs, firstly the economic and financial cash flows for six(6) airports have been made as shown in **Table 6.7.7 (2)** through **6.7.7 (7)**. Based on the abovementioned cash flows, EIRR (Economic Internal Rate of Return), Benefit/Cost ratio, EPNV (Economic Present Net Value), and FIRR (Financial Internal Rate of Return) have been calculated and obtained. In addition, EIRRs have been calculated in case of $\pm$10% change of costs and demands. The calculated results are summarized as shown in **Table 6.7.7 (1)**.

Table 6.7.7 (1) Summary of Economic and financial Analysis

	Akmola	Almaty	Aktau	Atyrau	Aktyubinsk	Pavlodar
economic analysis						
EIRR (%) (base case)	11.86	30.97	12.20	5.06	0.97	7.99
at the cost +10%	10.81	29.03	11.20	4.28	0.22	7.02
at the cost -10%	13.06	33.23	13.51	6.04	1.81	9.10
at the traffic +10%	12.95	33.01	13.39	5.95	1.73	9.0
at the traffic -10%	10.70	28.84	11.09	4.11	0.15	6.92
Benefit / Cost ratio at 5% discount rate	1.89	6.05	1.92	0.95	0.58	1.29
EPNV (million Tenge)						
at 5% discount rate	13,854	79,899	7,701	53	-2,493	2,743
at 10% discount rate	2,107	34,854	1343	-2,457	-3,268	-1046
at 15% discount rate	-2,163	15,646	-969	-3,076	-3,206	-2,249
financial analysis						
FIRR (%)	7.78	19.48	0.00	-4.68	-5.82	-3.23

Table 6.7.7 (2) Economic Cash Flow and Financial Cash Flows (Akmola Airport)

Akmola Economic Cash Flow and E.I.R.R. Calculation

Akmola		Construction					
	1996	1997	1998	1999	2000	2001	2002
Incremental Net Benefit accruing:							
a. Airport Sector							632
b. Air Transport Sector							213
c. Tourism Industry							21
d. Aircraft Fuel Sales							190
Total Benefit							1,056
Incremental Cost							
a. Construction Cost							
- Foreign Portion		150	150	3,866	3,866	3,866	
- Local Portion		74	79	1,589	1,589	1,589	
b. O & M Cost							
- Personnel & Adm.							1.8
- Operation & Mainte.							318.1
Total Cost	14,176	223	228	4,575	4,575	4,575	319.8
Residual Value							
Net Benefit(Revenue-Cost)		-223.2	-228.3	-4,574.7	-4,574.7	-4,574.7	736.4
Discounted Value in 1995							
At the rate of 5%		-212.6	-207.1	-3,951.8	-3,763.6	-3,584.4	549.5
At the rate of 10%		-202.9	-188.7	-3,437.8	-3,124.6	-2,840.5	415.7
At the rate of 15%		-194.1	-172.6	-3,007.9	-2,615.6	-2,274.4	318.4
At E.I.R.R.(%)	11.86	-199.6	-182.4	-3,268.4	-2,921.9	-2,612.1	375.9

Akmola	2003	2004	2005	2006	2007	2008	2009
Incremental Net Benefit accruing:							
a. Airport Sector	722	812	902	1,110	1,317	1,525	1,732
b. Air Transport Sector	252	290	328	381	433	486	538
c. Tourism Industry	25	29	33	39	44	50	56
d. Aircraft Fuel Sales	218	245	272	329	385	442	498
Total Benefit	1,216	1,376	1,536	1,858	2,180	2,502	2,824
Incremental Cost							
a. Construction Cost							
- Foreign Portion							
- Local Portion							
b. O & M Cost							
- Personnel & Adm.	2.6	3.5	4.4	7.2	10.0	12.7	15.5
- Operation & Mainte.	318.1	318.1	318.1	318.1	318.1	318.1	318.1
Total Cost	320.7	321.6	322.5	325.2	328.0	330.8	333.6
Residual Value							
Net Benefit(Revenue-Cost)	895.4	1,054.5	1,213.5	1,532.8	1,852.0	2,171.3	2,490.5
Discounted Value in 1995							
At the rate of 5%	636.4	713.7	782.3	941.0	1,082.8	1,209.0	1,320.8
At the rate of 10%	459.5	491.9	514.7	591.0	649.1	691.8	721.4
At the rate of 15%	336.6	344.7	345.0	378.9	398.1	405.8	404.8
At E.I.R.R.(%)	408.6	430.2	442.6	499.7	539.8	565.7	580.1

Akmola	2010	2011	2012	2013	2014	2015	2016
Incremental Net Benefit accruing:							
a. Airport Sector	1,939	2,043	2,147	2,251	2,354	2,458	2,458
b. Air Transport Sector	591	652	713	774	835	896	896
c. Tourism Industry	61	67	73	80	86	92	92
d. Aircraft Fuel Sales	555	583	611	639	668	696	696
Total Benefit	3,146	3,345	3,544	3,743	3,943	4,142	4,142
Incremental Cost							
a. Construction Cost							
- Foreign Portion		0.0					
- Local Portion		0.0					
b. O & M Cost							
- Personnel & Adm.	18.3	21.1	23.9	26.6	29.4	32.2	32.2
- Operation & Mainte.	318.1	318.1	318.1	318.1	318.1	318.1	318.1
Total Cost	336.4	339.1	341.9	344.7	347.5	350.3	350.3
Residual Value							
Net Benefit(Revenue-Cost)	2,809.7	3,006.1	3,202.4	3,398.7	3,595.0	3,791.3	3,791.3
Discounted Value in 1995							
At the rate of 5%	1,419.1	1,446.8	1,467.1	1,482.8	1,493.8	1,500.4	1,428.9
At the rate of 10%	739.9	719.6	696.9	672.4	646.6	619.9	563.6
At the rate of 15%	397.1	369.4	342.2	315.8	290.5	266.4	231.7
At E.I.R.R.(%)	585.1	559.6	532.9	505.6	478.1	450.8	403.0

Akmola	2017	2018	2019	2020	2021	2022	Total
Incremental Net Benefit accruing:							
a. Airport Sector	2,458	2,458	2,458	2,458	2,458	2,458	
b. Air Transport Sector	896	896	896	896	896	896	
c. Tourism Industry	92	92	92	92	92	92	
d. Aircraft Fuel Sales	696	696	696	696	696	696	
Total Benefit	4,142	4,142	4,142	4,142	4,142	4,142	
Incremental Cost							
a. Construction Cost							
- Foreign Portion							
- Local Portion							
b. O & M Cost							
- Personnel & Adm.	32.2	32.2	32.2	32.2	32.2	32.2	
- Operation & Mainte.	318.1	318.1	318.1	318.1	318.1	318.1	
Total Cost	350.3	350.3	350.3	350.3	350.3	350.3	
Residual Value						3,012.4	
Net Benefit(Revenue-Cost)	3,791.3	3,791.3	3,791.3	3,791.3	3,791.3	6,803.7	
Discounted Value in 1995							
At the rate of 5%	1,360.9	1,296.1	1,234.4	1,175.6	1,119.6	1,913.5	13,854
At the rate of 10%	512.3	465.8	423.4	384.9	349.9	570.9	2,107
At the rate of 15%	201.4	175.2	152.3	132.4	115.2	179.7	-2,163
At E.I.R.R.(%)	360.2	322.1	287.9	257.4	230.1	369.1	-0

Benefit/Cost Ratio	
At the rate of 5%	1.89
At the rate of 10%	1.18
At the rate of 15%	0.78

Akmola　　Financial Cash Flow for F.I.R.R.

Akmola		Construction Period						
		1997	1998	1999	2000	2001	2002	2003
1. Revenue							822	872
a) Airport Revenue							632	722
b) Aircraft Fuel Tax							190	218
2. Airport Expenses							338	339
a) Personnel Expenses							2	3
b) Operation & Maintenance							336	336
3. Total Fund Expenses	15,203	239	246	4,906	4,906	4,906	0	0
4. Residual Value								
5.1 Revenue(a+b)-Expenses	(FIRR)	-239	-246	-4,906	-4,906	-4,906	484	532
5.2 Discounted value at FIRR(%)	7.78	-222	-211	-3,918	-3,635	-3,373	309	315
6.1 Revenue(a)-Expenses		-239	-246	-4,906	-4,906	-4,906	293	383
6.2 Discounted value at FIRR(%)	5.94	-226	-219	-4,128	-3,895	-3,677	208	256

Akmola	2004	2005	2006	2007	2008	2009	2010	2011
1. Revenue	980	1,174	1,336	1,582	1,828	2,074	2,494	2,444
a) Airport Revenue	812	902	1,118	1,317	1,525	1,732	1,939	2,043
b) Aircraft Fuel Tax	245	272	329	385	442	498	555	583
2. Airport Expenses	340	341	344	346	349	352	355	358
a) Personnel Expenses	4	4	7	10	13	16	18	21
b) Operation & Maintenance	336	336	336	336	336	336	336	336
3. Total Fund Expenses	0	0	0	0	0	0	0	0
4. Residual Value								
5.1 Revenue(a+b)-Expenses	641	834	992	1,235	1,479	1,723	2,139	2,086
5.2 Discounted value at FIRR(%)	352	425	469	542	602	650	749	678
6.1 Revenue(a)-Expenses	472	562	766	971	1,175	1,380	1,585	1,686
6.2 Discounted value at FIRR(%)	288	334	430	515	588	652	707	709

Akmola	2012	2013	2014	2015	2016	2017	2018	2019
1. Revenue	2,567	2,690	2,813	2,936	2,936	2,936	2,936	2,936
a) Airport Revenue	2,147	2,251	2,354	2,458	2,458	2,458	2,458	2,458
b) Aircraft Fuel Tax	611	639	668	696	696	696	696	696
2. Airport Expenses	360	363	366	369	369	369	369	369
a) Personnel Expenses	24	27	29	32	32	32	32	32
b) Operation & Maintenance	336	336	336	336	336	336	336	336
3. Total Fund Expenses	0	0	0	0	0	0	0	0
4. Residual Value								
5.1 Revenue(a+b)-Expenses	2,207	2,327	2,447	2,568	2,568	2,568	2,568	2,568
5.2 Discounted value at FIRR(%)	665	651	635	618	573	532	494	458
6.1 Revenue(a)-Expenses	1,786	1,887	1,988	2,089	2,089	2,089	2,089	2,089
6.2 Discounted value at FIRR(%)	718	708	704	698	659	622	587	554

Akmola	2020	2021	2022	Total
1. Revenue	2,936	2,936	2,936	
a) Airport Revenue	2,458	2,458	2,458	
b) Aircraft Fuel Tax	696	696	696	
2. Airport Expenses	369	369	369	
a) Personnel Expenses	32	32	32	
b) Operation & Maintenance	336	336	336	
3. Total Fund Expenses	0	0	0	
4. Residual Value			3,231	
5.1 Revenue(a+b)-Expenses	2,568	2,568	5,798	
5.2 Discounted value at FIRR(%)	425	394	826	0.00
6.1 Revenue(a)-Expenses	2,089	2,089	5,320	
6.2 Discounted value at FIRR(%)	523	494	1,187	0.00

Table 6.7.7 (3) Economic Cash Flow and Financial Cash Flows (Aktau Airport)

Aktau Economic Cash Flow and E.I.R.R. Calculation

Aktau	1996	Construction 1997	1998	1999	2000	2001	2002
Incremental Net Benefit accruing:							
a. Airport Sector							101
b. Air Transport Sector							422
c. Tourism Industry							19
d. Aircraft Fuel Sales							29
Total Benefit							572
Incremental Cost							
a. Construction Cost							
- Foreign Portion		84	84	1,734	1,734	1,734	
- Local Portion		27	27	563	563	563	
b. O & M Cost							
- Personnel & Adm.							1.3
- Operation & Mainte.							199.5
Total Cost	7,112.9	111	111	2,297	2,297	2,297	201
Residual Value							
Net Benefit(Revenue-Cost)		-111.2	-111.2	-2,296.8	-2,296.8	-2,296.8	370.8
Discounted Value in 1995							
At the rate of 5%		-105.9	-100.9	-1,984.1	-1,889.6	-1,799.6	276.7
At the rate of 10%		-101.1	-91.9	-1,726.6	-1,568.8	-1,426.1	209.3
At the rate of 15%		-96.7	-84.1	-1,510.2	-1,313.2	-1,141.9	160.3
At E.I.R.R.(%)	12.28	-99.1	-88.2	-1,622.7	-1,445.2	-1,287.2	185.1

Aktau	2003	2004	2005	2006	2007	2008	2009
Incremental Net Benefit accruing:							
a. Airport Sector	116	130	145	195	245	295	346
b. Air Transport Sector	484	546	609	689	770	851	931
c. Tourism Industry	23	27	31	36	41	46	52
d. Aircraft Fuel Sales	33	37	42	57	73	88	104
Total Benefit	656	741	825	977	1,129	1,281	1,433
Incremental Cost							
a. Construction Cost							
- Foreign Portion							
- Local Portion							
b. O & M Cost							
- Personnel & Adm.	1.6	2.0	2.3	3.0	3.7	4.4	5.1
- Operation & Mainte.	199.5	199.5	199.5	199.5	199.5	199.5	199.5
Total Cost	201	201	202	202	203	204	205
Residual Value							
Net Benefit(Revenue-Cost)	455.1	539.4	623.6	774.8	925.9	1,077.0	1,228.1
Discounted Value in 1995							
At the rate of 5%	323.4	365.1	402.0	475.6	541.3	599.7	651.3
At the rate of 10%	233.5	251.6	264.5	298.7	324.5	343.2	355.7
At the rate of 15%	171.1	176.3	177.3	191.5	199.0	201.3	199.6
At E.I.R.R.(%)	202.3	213.5	219.9	243.3	259.0	268.3	272.5

Aktau	2010	2011	2012	2013	2014	2015	2016
Incremental Net Benefit accruing:							
a. Airport Sector	396	421	446	471	497	522	522
b. Air Transport Sector	1,012	1,121	1,231	1,340	1,449	1,558	1,558
c. Tourism Industry	57	64	72	79	87	94	94
d. Aircraft Fuel Sales	119	127	135	143	151	158	158
Total Benefit	1,584	1,734	1,884	2,033	2,183	2,332	2,332
Incremental Cost							
a. Construction Cost							
- Foreign Portion		0.0					
- Local Portion		0.0					
b. O & M Cost							
- Personnel & Adm.	5.8	6.4	7.1	7.8	8.5	9.2	9.2
- Operation & Mainte.	199.5	199.5	199.5	199.5	199.5	199.5	199.5
Total Cost	205	206	207	207	208	209	209
Residual Value							
Net Benefit(Revenue-Cost)	1,379.2	1,528.1	1,677.0	1,825.9	1,974.8	2,123.7	2,123.7
Discounted Value in 1995							
At the rate of 5%	696.6	735.1	768.3	796.6	820.6	840.4	800.4
At the rate of 10%	363.2	365.8	365.0	361.3	355.2	347.2	315.7
At the rate of 15%	194.9	187.8	179.2	169.7	159.6	149.2	129.8
At E.I.R.R.(%)	272.6	269.0	262.9	254.9	245.6	235.2	209.5

Aktau	2017	2018	2019	2020	2021	2022	Total
Incremental Net Benefit accruing:							
a. Airport Sector	522	522	522	522	522	522	
b. Air Transport Sector	1,558	1,558	1,558	1,558	1,558	1,558	
c. Tourism Industry	94	94	94	94	94	94	
d. Aircraft Fuel Sales	158	158	158	158	158	158	
Total Benefit	2,332	2,332	2,332	2,332	2,332	2,332	
Incremental Cost							
a. Construction Cost							
- Foreign Portion							
- Local Portion							
b. O & M Cost							
- Personnel & Adm.	9.2	9.2	9.2	9.2	9.2	9.2	
- Operation & Mainte.	199.5	199.5	199.5	199.5	199.5	199.5	
Total Cost	209	209	209	209	209	209	
Residual Value						1,511.5	
Net Benefit(Revenue-Cost)	2,123.7	2,123.7	2,123.7	2,123.7	2,123.7	3,635.2	
Discounted Value in 1995							
At the rate of 5%	762.3	726.0	691.4	658.5	627.1	1,022.4	7,701
At the rate of 10%	287.0	260.9	237.2	215.6	196.0	305.8	1,343
At the rate of 15%	112.8	98.1	85.3	74.2	64.5	96.0	-969
At E.I.R.R.(%)	186.6	166.2	148.0	131.8	117.4	179.8	-0

Benefit/Cost Ratio	
At the rate of 5%	1.92
At the rate of 10%	1.20
At the rate of 15%	0.79

Aktau

Financial Cash Flow for F.I.R.R.

Aktau		Construction Period						
		1997	1998	1999	2000	2001	2002	2003
1. Revenue							130	149
a) Airport Revenue							101	116
b) Aircraft Fuel Tax							29	33
2. Airport Expenses							208	209
a) Personnel Expenses							1	2
b) Operation & Maintenance							207	207
3. Total Fund Expenses	7,495	117	117	2,420	2,420	2,420	0	0
4. Residual Value								
5.1 Revenue(a+b)-Expenses		-117	-117	-2,420	-2,420	-2,420	-78	-60
5.2 Discounted value at FIRR(%)	0.00	-117	-117	-2,421	-2,421	-2,421	-78	-60
6.1 Revenue(a)-Expenses		-117	-117	-2,420	-2,420	-2,420	-107	-93
6.2 Discounted value at FIRR(%)	-2.04	-120	-122	-2,574	-2,628	-2,682	-121	-108

Aktau	2004	2005	2006	2007	2008	2009	2010	2011
1. Revenue	168	186	252	318	384	450	515	548
a) Airport Revenue	130	145	195	245	295	346	396	421
b) Aircraft Fuel Tax	37	42	57	73	88	104	119	127
2. Airport Expenses	209	210	210	211	212	212	213	214
a) Personnel Expenses	2	2	3	4	4	5	6	6
b) Operation & Maintenance	207	207	207	207	207	207	207	207
3. Total Fund Expenses	0	0	0	0	0	0	0	0
4. Residual Value								
5.1 Revenue(a+b)-Expenses	-42	-23	42	107	172	237	302	335
5.2 Discounted value at FIRR(%)	-42	-23	42	107	172	237	303	335
6.1 Revenue(a)-Expenses	-79	-65	-15	34	84	133	183	207
6.2 Discounted value at FIRR(%)	-93	-78	-19	43	107	174	244	282

Aktau	2012	2013	2014	2015	2016	2017	2018	2019
1. Revenue	581	614	647	680	680	680	680	680
a) Airport Revenue	446	471	497	522	522	522	522	522
b) Aircraft Fuel Tax	135	143	151	158	158	158	158	158
2. Airport Expenses	214	215	216	216	216	216	216	216
a) Personnel Expenses	7	8	8	9	9	9	9	9
b) Operation & Maintenance	207	207	207	207	207	207	207	207
3. Total Fund Expenses	0	0	0	0	0	0	0	0
4. Residual Value								
5.1 Revenue(a+b)-Expenses	367	399	431	464	464	464	464	464
5.2 Discounted value at FIRR(%)	367	399	432	464	464	464	464	464
6.1 Revenue(a)-Expenses	232	256	281	305	305	305	305	305
6.2 Discounted value at FIRR(%)	322	364	407	451	461	478	480	490

Aktau	2020	2021	2022	Total
1. Revenue	680	680	680	
a) Airport Revenue	522	522	522	
b) Aircraft Fuel Tax	158	158	158	
2. Airport Expenses	216	216	216	
a) Personnel Expenses	9	9	9	
b) Operation & Maintenance	207	207	207	
3. Total Fund Expenses	0	0	0	
4. Residual Value			1,593	
5.1 Revenue(a+b)-Expenses	464	464	2,056	
5.2 Discounted value at FIRR(%)	464	464	2,058	0.00
6.1 Revenue(a)-Expenses	305	305	1,898	
6.2 Discounted value at FIRR(%)	500	510	3,240	0.00

Table 6.7.7 (4) Economic Cash Flow and Financial Cash Flows (Aktyubinsk Airport)

Aktyubinsk Economic Cash Flow and E.I.R.R. Calculation

Aktyubinsk		Construction					
	1996	1997	1998	1999	2000	2001	2002
Incremental Net Benefit accruing:							
a. Airport Sector							19
b. Air Transport Sector							88
c. Tourism Industry							4
d. Aircraft Fuel Sales							6
Total Benefit							118
Incremental Cost							
a. Construction Cost							
- Foreign Portion		72	72	1,533	1,533	1,533	
- Local Portion		24	24	502	502	502	
b. O & M Cost							
- Personnel & Adm.							0.0
- Operation & Mainte.							167.5
Total Cost	6,296.4	96	96	2,035	2,035	2,035	167.5
Residual Value							
Net Benefit(Revenue-Cost)		-95.8	-95.8	-2,035.0	-2,035.0	-2,035.0	-49.7
Discounted Value in 1995							
At the rate of 5%		-91.2	-86.9	-1,757.9	-1,674.2	-1,594.4	-37.1
At the rate of 10%		-87.1	-79.2	-1,528.9	-1,389.9	-1,263.6	-28.0
At the rate of 15%		-83.3	-72.4	-1,338.0	-1,163.5	-1,011.7	-21.5
At E.I.R.R.(%)	0.97	-94.9	-93.9	-1,977.0	-1,958.1	-1,939.3	-46.9

Aktyubinsk	2003	2004	2005	2006	2007	2008	2009
Incremental Net Benefit accruing:							
a. Airport Sector	22	25	28	50	72	94	117
b. Air Transport Sector	103	118	133	155	177	199	221
c. Tourism Industry	5	6	6	8	9	10	11
d. Aircraft Fuel Sales	7	8	9	14	19	24	28
Total Benefit	137	157	176	227	277	327	378
Incremental Cost							
a. Construction Cost							
- Foreign Portion							
- Local Portion							
b. O & M Cost							
- Personnel & Adm.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
- Operation & Mainte.	167.5	167.5	167.5	167.5	167.5	167.5	167.5
Total Cost	167.5	167.5	167.5	167.5	167.5	167.5	167.5
Residual Value							
Net Benefit(Revenue-Cost)	-30.1	-10.6	8.9	59.2	109.5	159.7	210.0
Discounted Value in 1995							
At the rate of 5%	-21.4	-7.2	5.8	36.3	64.0	89.0	111.4
At the rate of 10%	-15.5	-4.9	3.8	22.8	38.4	50.9	60.8
At the rate of 15%	-11.3	-3.5	2.5	14.6	23.5	29.9	34.1
At E.I.R.R.(%)	-28.2	-9.8	8.2	53.8	98.5	142.3	185.3

Aktyubinsk	2010	2011	2012	2013	2014	2015	2016
Incremental Net Benefit accruing:							
a. Airport Sector	139	150	161	172	183	194	194
b. Air Transport Sector	243	273	303	332	362	392	392
c. Tourism Industry	12	14	15	17	19	20	20
d. Aircraft Fuel Sales	33	36	38	41	43	46	46
Total Benefit	428	473	518	562	607	652	652
Incremental Cost							
a. Construction Cost							
- Foreign Portion		0.0					
- Local Portion		0.0					
b. O & M Cost							
- Personnel & Adm.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
- Operation & Mainte.	167.5	167.5	167.5	167.5	167.5	167.5	167.5
Total Cost	167.5	167.5	167.5	167.5	167.5	167.5	167.5
Residual Value							
Net Benefit(Revenue-Cost)	260.3	305.1	350.0	394.8	439.7	484.5	484.5
Discounted Value in 1995							
At the rate of 5%	131.5	146.8	160.3	172.3	182.7	191.7	182.6
At the rate of 10%	68.5	73.0	76.2	78.1	79.1	79.2	72.0
At the rate of 15%	36.8	37.5	37.4	36.7	35.5	34.8	29.6
At E.I.R.R.(%)	227.5	264.1	300.0	335.2	369.7	403.5	399.7

Aktyubinsk	2017	2018	2019	2020	2021	2022	Total
Incremental Net Benefit accruing:							
a. Airport Sector	194	194	194	194	194	194	
b. Air Transport Sector	392	392	392	392	392	392	
c. Tourism Industry	20	20	20	20	20	20	
d. Aircraft Fuel Sales	46	46	46	46	46	46	
Total Benefit	652	652	652	652	652	652	
Incremental Cost							
a. Construction Cost							
- Foreign Portion							
- Local Portion							
b. O & M Cost							
- Personnel & Adm.	0.0	0.0	0.0	0.0	0.0	0.0	
- Operation & Mainte.	167.5	167.5	167.5	167.5	167.5	167.5	
Total Cost	167.5	167.5	167.5	167.5	167.5	167.5	
Residual Value						1,337.9	
Net Benefit(Revenue-Cost)	484.5	484.5	484.5	484.5	484.5	1,822.4	
Discounted Value in 1995							
At the rate of 5%	173.9	165.6	157.7	150.2	143.1	512.5	-2,493
At the rate of 10%	65.5	59.5	54.1	49.2	44.7	152.9	-3,268
At the rate of 15%	25.7	22.4	19.5	16.9	14.7	48.1	-3,206
At E.I.R.R.(%)	395.8	392.0	388.3	384.6	380.9	1,418.8	-0

Benefit/Cost Ratio	
At the rate of 5%	0.58
At the rate of 10%	0.36
At the rate of 15%	0.23

Aktyubinsk Financial Cash Flow for F.I.R.R.

Aktyubinsk		Construction Period						
		1997	1998	1999	2000	2001	2002	2003
1. Revenue							26	29
a) Airport Revenue							19	22
b) Aircraft Fuel Tax							6	7
2. Airport Expenses							161	161
a) Personnel Expenses							0	0
b) Operation & Maintenance							174	174
3. Total Fund Expenses	6,637	101	101	2,145	2,145	2,145	0	0
4. Residual Value								
5.1 Revenue(a+b)-Expenses		-101	-101	-2,145	-2,145	-2,145	-136	-132
5.2 Discounted value at FIRR(%)	-5.82	-107	-114	-2,568	-2,726	-2,895	-195	-201
6.1 Revenue(a)-Expenses		-101	-101	-2,145	-2,145	-2,145	-142	-139
6.2 Discounted value at FIRR(%)	-6.92	-108	-117	-2,660	-2,857	-3,078	-218	-230

Aktyubinsk	2004	2005	2006	2007	2008	2009	2010	2011
1. Revenue	33	37	64	91	118	145	172	186
a) Airport Revenue	25	28	50	72	94	117	139	150
b) Aircraft Fuel Tax	8	9	14	19	24	28	33	36
2. Airport Expenses	161	161	161	161	161	161	161	161
a) Personnel Expenses	0	0	0	0	0	0	0	0
b) Operation & Maintenance	174	174	174	174	174	174	174	174
3. Total Fund Expenses	0	0	0	0	0	0	0	0
4. Residual Value								
5.1 Revenue(a+b)-Expenses	-128	-125	-98	-71	-43	-16	11	24
5.2 Discounted value at FIRR(%)	-207	-214	-178	-136	-89	-36	25	60
6.1 Revenue(a)-Expenses	-136	-134	-111	-89	-67	-45	-23	-11
6.2 Discounted value at FIRR(%)	-242	-255	-228	-196	-158	-114	-61	-33

Aktyubinsk	2012	2013	2014	2015	2016	2017	2018	2019
1. Revenue	199	213	226	240	240	240	240	240
a) Airport Revenue	161	172	183	194	194	194	194	194
b) Aircraft Fuel Tax	38	41	43	46	46	46	46	46
2. Airport Expenses	161	161	161	161	161	161	161	161
a) Personnel Expenses	0	0	0	0	0	0	0	0
b) Operation & Maintenance	174	174	174	174	174	174	174	174
3. Total Fund Expenses	0	0	0	0	0	0	0	0
4. Residual Value								
5.1 Revenue(a+b)-Expenses	38	52	65	79	79	79	79	79
5.2 Discounted value at FIRR(%)	99	143	191	246	261	277	294	312
6.1 Revenue(a)-Expenses	-0	11	22	33	33	33	33	33
6.2 Discounted value at FIRR(%)	-1	37	80	129	139	149	160	172

Aktyubinsk	2020	2021	2022	Total
1. Revenue	240	240	240	
a) Airport Revenue	194	194	194	
b) Aircraft Fuel Tax	46	46	46	
2. Airport Expenses	161	161	161	
a) Personnel Expenses	0	0	0	
b) Operation & Maintenance	174	174	174	
3. Total Fund Expenses	0	0	0	
4. Residual Value			1,410	
5.1 Revenue(a+b)-Expenses	79	79	1,489	
5.2 Discounted value at FIRR(%)	331	352	7,074	0.00
6.1 Revenue(a)-Expenses	33	33	1,443	
6.2 Discounted value at FIRR(%)	185	198	9,302	0.00

Table 6.7.7 (5) Economic Cash Flow and Financial Cash Flows (Almaty Airport)

Almaty Economic Cash Flow and E.I.R.R. Calculation

Almaty	1996	Construction 1997	1998	1999	2000	2001	2002
Incremental Net Benefit accruing:							
a. Airport Sector							2,169
b. Air Transport Sector							1,627
c. Tourism Industry							160
d. Aircraft Fuel Sales							758
Total Benefit							4,714
Incremental Cost							
a. Construction Cost							
- Foreign Portion		153	181	3,329	3,329	3,329	
- Local Portion		71	71	1,552	1,552	1,552	
b. O & M Cost							
- Personnel & Adm.							2.3
- Operation & Mainte.							298.8
Total Cost	15,119.4	224	252	4,881	4,881	4,881	301.2
Residual Value							
Net Benefit(Revenue-Cost)		-223.8	-251.9	-4,881.2	-4,881.2	-4,881.2	4,413.1
Discounted Value in 1995							
At the rate of 5%		-213.1	-228.5	-4,216.6	-4,015.8	-3,824.6	3,293.1
At the rate of 10%		-203.4	-208.2	-3,667.3	-3,333.9	-3,030.9	2,491.1
At the rate of 15%		-194.6	-190.5	-3,209.5	-2,798.9	-2,426.8	1,907.9
At E.I.R.R.(%)	30.97	-170.9	-146.8	-2,172.6	-1,658.8	-1,266.5	874.2

Almaty	2003	2004	2005	2006	2007	2008	2009
Incremental Net Benefit accruing:							
a. Airport Sector	2,479	2,789	3,099	3,273	3,447	3,621	3,795
b. Air Transport Sector	1,985	2,184	2,463	2,812	3,160	3,508	3,856
c. Tourism Industry	187	213	239	271	302	333	364
d. Aircraft Fuel Sales	866	975	1,083	1,132	1,181	1,229	1,278
Total Benefit	5,438	6,161	6,885	7,487	8,089	8,692	9,294
Incremental Cost							
a. Construction Cost							
- Foreign Portion							
- Local Portion							
b. O & M Cost							
- Personnel & Adm.	3.5	4.6	5.8	7.8	9.8	11.8	13.8
- Operation & Mainte.	298.8	298.8	298.8	298.8	298.8	298.8	298.8
Total Cost	302.3	303.5	304.6	306.6	308.6	310.6	312.6
Residual Value							
Net Benefit(Revenue-Cost)	5,135.4	5,857.7	6,580.0	7,180.4	7,780.9	8,381.3	8,981.7
Discounted Value in 1995							
At the rate of 5%	3,649.6	3,964.7	4,241.5	4,488.2	4,549.3	4,667.8	4,763.2
At the rate of 10%	2,635.3	2,732.7	2,790.6	2,768.4	2,727.1	2,670.5	2,601.7
At the rate of 15%	1,930.6	1,914.9	1,870.4	1,774.9	1,672.4	1,566.5	1,459.8
At E.I.R.R.(%)	776.7	676.5	580.2	483.4	399.9	328.9	269.1

Almaty	2010	2011	2012	2013	2014	2015	2016
Incremental Net Benefit accruing:							
a. Airport Sector	3,969	4,056	4,143	4,230	4,317	4,404	4,404
b. Air Transport Sector	4,285	4,633	5,061	5,490	5,918	6,346	6,346
c. Tourism Industry	396	432	469	506	543	580	580
d. Aircraft Fuel Sales	1,327	1,351	1,376	1,400	1,425	1,449	1,449
Total Benefit	9,897	10,473	11,050	11,626	12,203	12,779	12,779
Incremental Cost							
a. Construction Cost							
- Foreign Portion		0.0					
- Local Portion		0.0					
b. O & M Cost							
- Personnel & Adm.	15.8	17.7	19.7	21.7	23.7	25.7	25.7
- Operation & Mainte.	298.8	298.8	298.8	298.8	298.8	298.8	298.8
Total Cost	314.6	316.6	318.6	320.5	322.5	324.5	324.5
Residual Value							
Net Benefit(Revenue-Cost)	9,582.1	10,156.6	10,731.1	11,305.5	11,880.0	12,454.5	12,454.5
Discounted Value in 1995							
At the rate of 5%	4,839.6	4,885.5	4,916.0	4,932.6	4,936.4	4,928.6	4,694.0
At the rate of 10%	2,523.3	2,431.4	2,335.4	2,236.7	2,136.7	2,036.4	1,851.3
At the rate of 15%	1,354.2	1,248.2	1,146.8	1,050.6	960.0	875.1	761.0
At E.I.R.R.(%)	219.2	177.4	143.1	115.1	92.4	73.9	56.4

Almaty	2017	2018	2019	2020	2021	2022	Total
Incremental Net Benefit accruing:							
a. Airport Sector	4,404	4,404	4,404	4,404	4,404	4,404	
b. Air Transport Sector	6,346	6,346	6,346	6,346	6,346	6,346	
c. Tourism Industry	580	580	580	580	580	580	
d. Aircraft Fuel Sales	1,449	1,449	1,449	1,449	1,449	1,449	
Total Benefit	12,779	12,779	12,779	12,779	12,779	12,779	
Incremental Cost							
a. Construction Cost							
- Foreign Portion							
- Local Portion							
b. O & M Cost							
- Personnel & Adm.	25.7	25.7	25.7	25.7	25.7	25.7	
- Operation & Mainte.	298.8	298.8	298.8	298.8	298.8	298.8	
Total Cost	324.5	324.5	324.5	324.5	324.5	324.5	
Residual Value						3,212.8	
Net Benefit(Revenue-Cost)	12,454.5	12,454.5	12,454.5	12,454.5	12,454.5	15,667.2	
Discounted Value in 1995							
At the rate of 5%	4,478.4	4,257.6	4,054.8	3,861.7	3,677.8	4,406.3	79,899
At the rate of 10%	1,683.0	1,530.0	1,390.9	1,264.4	1,149.5	1,314.6	34,857
At the rate of 15%	661.7	575.4	500.4	435.1	378.3	413.9	15,646
At E.I.R.R.(%)	43.1	32.9	25.1	19.2	14.6	14.1	-0

Benefit/Cost Ratio	
At the rate of 5%	6.05
At the rate of 10%	3.85
At the rate of 15%	2.59

Almaty　　Financial Cash Flow for F.I.R.R.

Almaty		Construction Period						
		1997	1998	1999	2000	2001	2002	2003
1. Revenue							2,928	3,346
a) Airport Revenue							2,169	2,479
b) Aircraft Fuel Tax							758	866
2. Airport Expenses							317	299
a) Personnel Expenses							2	3
b) Operation & Maintenance							314	314
3. Total Fund Expenses	16,173	239	268	5,222	5,222	5,222		0
4. Residual Value								
5.1 Revenue(a+b)-Expenses		-239	-268	-5,222	-5,222	-5,222	2,611	3,046
5.2 Discounted value at FIRR(%)	19.48	-208	-187	-3,062	-2,563	-2,145	898	877
6.1 Revenue(a)-Expenses		-239	-268	-5,222	-5,222	-5,222	1,853	2,180
6.2 Discounted value at FIRR(%)	15.06	-208	-202	-3,428	-2,980	-2,590	799	817

Almaty	2004	2005	2006	2007	2008	2009	2010	2011
1. Revenue	3,764	4,182	4,405	4,628	4,851	5,073	5,296	5,408
a) Airport Revenue	2,789	3,099	3,273	3,447	3,621	3,795	3,969	4,056
b) Aircraft Fuel Tax	975	1,083	1,132	1,181	1,229	1,278	1,327	1,351
2. Airport Expenses	300	302	304	306	308	310	312	314
a) Personnel Expenses	5	6	8	10	12	14	16	18
b) Operation & Maintenance	314	314	314	314	314	314	314	314
3. Total Fund Expenses	0	0	0	0	0	0	0	0
4. Residual Value								
5.1 Revenue(a+b)-Expenses	3,464	3,881	4,101	4,322	4,543	4,764	4,985	5,094
5.2 Discounted value at FIRR(%)	834	782	692	610	537	471	413	353
6.1 Revenue(a)-Expenses	2,489	2,797	2,969	3,142	3,314	3,486	3,658	3,743
6.2 Discounted value at FIRR(%)	810	792	730	672	616	563	513	457

Almaty	2012	2013	2014	2015	2016	2017	2018	2019
1. Revenue	5,519	5,630	5,742	5,853	5,853	5,853	5,853	5,853
a) Airport Revenue	4,143	4,230	4,317	4,404	4,404	4,404	4,404	4,404
b) Aircraft Fuel Tax	1,376	1,400	1,425	1,449	1,449	1,449	1,449	1,449
2. Airport Expenses	316	318	320	321	321	321	321	321
a) Personnel Expenses	20	22	24	26	26	26	26	26
b) Operation & Maintenance	314	314	314	314	314	314	314	314
3. Total Fund Expenses	0	0	0	0	0	0	0	0
4. Residual Value								
5.1 Revenue(a+b)-Expenses	5,204	5,313	5,422	5,532	5,532	5,532	5,532	5,532
5.2 Discounted value at FIRR(%)	302	258	220	188	157	132	110	92
6.1 Revenue(a)-Expenses	3,828	3,913	3,998	4,083	4,083	4,083	4,083	4,083
6.2 Discounted value at FIRR(%)	486	361	320	284	247	215	187	162

Almaty	2020	2021	2022	Total
1. Revenue	5,853	5,853	5,853	
a) Airport Revenue	4,404	4,404	4,404	
b) Aircraft Fuel Tax	1,449	1,449	1,449	
2. Airport Expenses	321	321	321	
a) Personnel Expenses	26	26	26	
b) Operation & Maintenance	314	314	314	
3. Total Fund Expenses	0	0	0	
4. Residual Value			3,437	
5.1 Revenue(a+b)-Expenses	5,532	5,532	8,968	
5.2 Discounted value at FIRR(%)	77	65	88	0.00
6.1 Revenue(a)-Expenses	4,083	4,083	7,519	
6.2 Discounted value at FIRR(%)	141	122	196	0.00

Table 6.7.7 (6) Economic Cash Flow and Financial Cash Flows (Atyrau Airport)

Atyrau Economic Cash Flow and E.I.R.R. Calculation

Atyrau		Construction					
	1996	1997	1998	1999	2000	2001	2002
Incremental Net Benefit accruing:							
a. Airport Sector							59
b. Air Transport Sector							215
c. Tourism Industry							12
d. Aircraft Fuel Sales							15
Total Benefit							300
Incremental Cost							
a. Construction Cost							
- Foreign Portion		88	88	1,904	1,904	1,904	
- Local Portion		26	26	573	573	573	
b. O & M Cost							
- Personnel & Adm.							0.0
- Operation & Mainte.							201.5
Total Cost	7,660.4	114	114	2,477	2,477	2,477	201.5
Residual Value							
Net Benefit(Revenue-Cost)		-114.4	-114.4	-2,477.2	-2,477.2	-2,477.2	98.9
Discounted Value in 1995							
At the rate of 5%		-109.0	-103.8	-2,139.9	-2,038.0	-1,940.9	73.8
At the rate of 10%		-104.0	-94.5	-1,861.1	-1,691.9	-1,538.1	55.8
At the rate of 15%		-99.5	-86.5	-1,628.8	-1,416.3	-1,231.6	42.8
At E.I.R.R.(%)	5.06	-108.9	-103.6	-2,136.1	-2,033.2	-1,935.3	73.6

Atyrau	2003	2004	2005	2006	2007	2008	2009
Incremental Net Benefit accruing:							
a. Airport Sector	67	75	84	111	139	166	194
b. Air Transport Sector	247	279	311	353	395	437	480
c. Tourism Industry	14	16	18	21	24	27	30
d. Aircraft Fuel Sales	17	19	21	27	33	39	45
Total Benefit	345	390	434	513	591	670	748
Incremental Cost							
a. Construction Cost							
- Foreign Portion							
- Local Portion							
b. O & M Cost							
- Personnel & Adm.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
- Operation & Mainte.	201.5	201.5	201.5	201.5	201.5	201.5	201.5
Total Cost	201.5	201.5	201.5	201.5	201.5	201.5	201.5
Residual Value							
Net Benefit(Revenue-Cost)	143.6	188.2	232.8	311.3	389.8	468.3	546.8
Discounted Value in 1995							
At the rate of 5%	102.0	127.4	150.1	191.1	227.9	260.8	290.0
At the rate of 10%	73.7	87.8	98.7	120.0	136.6	149.2	158.4
At the rate of 15%	54.0	61.5	66.2	77.0	83.8	87.5	88.9
At E.I.R.R.(%)	101.6	126.8	149.3	190.0	226.4	258.9	287.8

Atyrau	2010	2011	2012	2013	2014	2015	2016
Incremental Net Benefit accruing:							
a. Airport Sector	221	235	249	262	276	290	290
b. Air Transport Sector	522	579	637	694	752	810	810
c. Tourism Industry	32	36	40	44	48	51	51
d. Aircraft Fuel Sales	51	54	57	60	63	66	66
Total Benefit	827	905	983	1,061	1,139	1,217	1,217
Incremental Cost							
a. Construction Cost							
- Foreign Portion		0.0					
- Local Portion		0.0					
b. O & M Cost							
- Personnel & Adm.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
- Operation & Mainte.	201.5	201.5	201.5	201.5	201.5	201.5	201.5
Total Cost	201.5	201.5	201.5	201.5	201.5	201.5	201.5
Residual Value							
Net Benefit(Revenue-Cost)	625.3	703.3	781.4	859.4	937.5	1,015.6	1,015.6
Discounted Value in 1995							
At the rate of 5%	315.8	338.3	358.0	375.0	389.5	401.9	382.8
At the rate of 10%	184.6	168.4	170.0	170.0	168.6	166.1	151.0
At the rate of 15%	88.4	86.4	83.5	79.9	75.8	71.4	62.1
At E.I.R.R.(%)	313.2	335.3	354.6	371.2	385.5	397.4	378.3

Atyrau	2017	2018	2019	2020	2021	2022	Total
Incremental Net Benefit accruing:							
a. Airport Sector	290	290	290	290	290	290	
b. Air Transport Sector	810	810	810	810	810	810	
c. Tourism Industry	51	51	51	51	51	51	
d. Aircraft Fuel Sales	66	66	66	66	66	66	
Total Benefit	1,217	1,217	1,217	1,217	1,217	1,217	
Incremental Cost							
a. Construction Cost							
- Foreign Portion							
- Local Portion							
b. O & M Cost							
- Personnel & Adm.	0.0	0.0	0.0	0.0	0.0	0.0	
- Operation & Mainte.	201.5	201.5	201.5	201.5	201.5	201.5	
Total Cost	201.5	201.5	201.5	201.5	201.5	201.5	
Residual Value						1,627.8	
Net Benefit(Revenue-Cost)	1,015.6	1,015.6	1,015.6	1,015.6	1,015.6	2,643.3	
Discounted Value in 1995							
At the rate of 5%	364.5	347.2	330.6	314.9	299.9	743.4	53
At the rate of 10%	137.2	124.8	113.4	103.1	93.7	221.8	-2,457
At the rate of 15%	54.0	46.9	40.8	35.5	30.9	69.8	-3,076
At E.I.R.R.(%)	360.1	342.7	326.2	310.5	295.6	732.1	-0

Benefit/Cost Ratio	
At the rate of 5%	0.95
At the rate of 10%	0.59
At the rate of 15%	0.39

Atyrau Financial Cash Flow for F.I.R.R.

Atyrau		Construction Period						
		1997	1998	1999	2000	2001	2002	2003
1. Revenue							74	84
a) Airport Revenue							59	67
b) Aircraft Fuel Tax							15	17
2. Airport Expenses							208	208
a) Personnel Expenses							0	0
b) Operation & Maintenance							208	208
3. Total Fund Expenses	8,049	120	120	2,603	2,603	2,603		0
4. Residual Value								
5.1 Revenue(a+b)-Expenses		-120	-120	-2,603	-2,603	-2,603	-134	-124
5.2 Discounted value at FIRR(%)	-4.68	-126	-132	-3,006	-3,153	-3,308	-179	-173
6.1 Revenue(a)-Expenses		-120	-120	-2,603	-2,603	-2,603	-149	-141
6.2 Discounted value at FIRR(%)	-5.92	-128	-136	-3,126	-3,323	-3,533	-216	-216

Atyrau	2004	2005	2006	2007	2008	2009	2010	2011
1. Revenue	95	105	139	172	206	239	273	289
a) Airport Revenue	75	84	111	139	166	194	221	235
b) Aircraft Fuel Tax	19	21	27	33	39	45	51	54
2. Airport Expenses	208	208	208	208	208	208	208	208
a) Personnel Expenses	0	0	0	0	0	0	0	0
b) Operation & Maintenance	208	208	208	208	208	208	208	208
3. Total Fund Expenses	0	0	0	0	0	0	0	0
4. Residual Value								
5.1 Revenue(a+b)-Expenses	-113	-103	-69	-36	-3	31	64	81
5.2 Discounted value at FIRR(%)	-166	-158	-112	-61	-4	58	126	166
6.1 Revenue(a)-Expenses	-133	-124	-97	-69	-42	-14	13	27
6.2 Discounted value at FIRR(%)	-216	-215	-178	-136	-87	-32	31	67

Atyrau	2012	2013	2014	2015	2016	2017	2018	2019
1. Revenue	306	323	339	356	356	356	356	356
a) Airport Revenue	249	262	276	290	290	290	290	290
b) Aircraft Fuel Tax	57	60	63	66	66	66	66	66
2. Airport Expenses	208	208	208	208	208	208	208	208
a) Personnel Expenses	0	0	0	0	0	0	0	0
b) Operation & Maintenance	208	208	208	208	208	208	208	208
3. Total Fund Expenses	0	0	0	0	0	0	0	0
4. Residual Value								
5.1 Revenue(a+b)-Expenses	98	114	131	148	148	148	148	148
5.2 Discounted value at FIRR(%)	211	259	311	368	386	405	425	446
6.1 Revenue(a)-Expenses	41	54	68	82	82	82	82	82
6.2 Discounted value at FIRR(%)	108	153	204	261	277	295	313	333

Atyrau	2020	2021	2022	Total
1. Revenue	356	356	356	
a) Airport Revenue	290	290	290	
b) Aircraft Fuel Tax	66	66	66	
2. Airport Expenses	208	208	208	
a) Personnel Expenses	0	0	0	
b) Operation & Maintenance	208	208	208	
3. Total Fund Expenses	0	0	0	
4. Residual Value			1,710	
5.1 Revenue(a+b)-Expenses	148	148	1,858	
5.2 Discounted value at FIRR(%)	467	490	6,463	0.00
6.1 Revenue(a)-Expenses	82	82	1,792	
6.2 Discounted value at FIRR(%)	354	376	8,771	0.00

Table 6.7.7 (7) Economic Cash Flow and Financial Cash Flows (Pavlodar Airport)

Pavlodar Economic Cash Flow and E.I.R.R. Calculation

Pavlodar	1996	Construction 1997	1998	1999	2000	2001	2002
Incremental Net Benefit accruing:							
a. Airport Sector							88
b. Air Transport Sector							335
c. Tourism Industry							3
d. Aircraft Fuel Sales							15
Total Benefit							440
Incremental Cost							
a. Construction Cost							
- Foreign Portion		83	83	1,802	1,802	1,802	
- Local Portion		27	27	583	583	583	
b. O & M Cost							
- Personnel & Adm.							2.3
- Operation & Mainte.							198.3
Total Cost	7,374.7	109	109	2,385	2,385	2,385	201
Residual Value							
Net Benefit(Revenue-Cost)		-109.5	-109.5	-2,385.3	-2,385.3	-2,385.3	239.7
Discounted Value in 1995							
At the rate of 5%		-104.3	-99.3	-2,868.5	-1,962.4	-1,868.9	178.8
At the rate of 10%		-99.5	-90.5	-1,792.1	-1,629.2	-1,481.1	135.3
At the rate of 15%		-95.2	-82.8	-1,568.4	-1,363.8	-1,185.9	103.6
At E.I.R.R.(%)	7.99	-101.4	-93.9	-1,893.8	-1,753.7	-1,623.8	151.1

Pavlodar	2003	2004	2005	2006	2007	2008	2009
Incremental Net Benefit accruing:							
a. Airport Sector	100	113	125	168	195	229	264
b. Air Transport Sector	374	413	453	507	562	617	672
c. Tourism Industry	4	5	5	6	7	8	9
d. Aircraft Fuel Sales	17	19	21	28	36	43	50
Total Benefit	495	550	604	702	800	898	995
Incremental Cost							
a. Construction Cost							
- Foreign Portion							
- Local Portion							
b. O & M Cost							
- Personnel & Adm.	2.6	3.5	4.4	7.2	10.0	12.7	15.5
- Operation & Mainte.	198.3	198.3	198.3	198.3	198.3	198.3	198.3
Total Cost	201	202	203	205	208	211	214
Residual Value							
Net Benefit(Revenue-Cost)	294.0	347.8	401.6	496.6	591.6	686.6	781.6
Discounted Value in 1995							
At the rate of 5%	209.0	235.4	258.9	304.9	345.9	382.3	414.5
At the rate of 10%	150.9	162.3	170.3	191.5	207.4	218.8	226.4
At the rate of 15%	110.5	113.7	114.2	122.8	127.2	128.3	127.0
At E.I.R.R.(%)	171.6	186.0	201.0	230.2	253.9	272.9	287.6

Pavlodar	2010	2011	2012	2013	2014	2015	2016
Incremental Net Benefit accruing:							
a. Airport Sector	299	316	333	351	368	385	385
b. Air Transport Sector	727	803	879	955	1,031	1,108	1,108
c. Tourism Industry	10	11	12	14	15	16	16
d. Aircraft Fuel Sales	58	61	65	69	72	76	76
Total Benefit	1,093	1,192	1,290	1,388	1,487	1,585	1,585
Incremental Cost							
a. Construction Cost							
- Foreign Portion		0.0					
- Local Portion		0.0					
b. O & M Cost							
- Personnel & Adm.	18.3	21.1	23.9	26.6	29.4	32.2	32.2
- Operation & Mainte.	198.3	198.3	198.3	198.3	198.3	198.3	198.3
Total Cost	217	219	222	225	228	231	231
Residual Value							
Net Benefit(Revenue-Cost)	876.7	972.2	1,067.8	1,163.4	1,259.0	1,354.5	1,354.5
Discounted Value in 1995							
At the rate of 5%	442.8	467.7	489.2	507.6	523.1	536.0	510.5
At the rate of 10%	230.9	232.7	232.4	230.2	226.4	221.5	201.3
At the rate of 15%	123.9	119.5	114.1	108.1	101.7	95.2	82.8
At E.I.R.R.(%)	298.7	386.8	312.0	314.7	315.4	314.2	291.0

Payloder	2017	2018	2019	2020	2021	2022	Total
Incremental Net Benefit accruing:							
a. Airport Sector	385	385	385	385	385	385	
b. Air Transport Sector	1,108	1,108	1,108	1,108	1,108	1,108	
c. Tourism Industry	16	16	16	16	16	16	
d. Aircraft Fuel Sales	76	76	76	76	76	76	
Total Benefit	1,585	1,585	1,585	1,585	1,585	1,585	
Incremental Cost							
a. Construction Cost							
- Foreign Portion							
- Local Portion							
b. O & M Cost							
- Personnel & Adm.	32.2	32.2	32.2	32.2	32.2	32.2	
- Operation & Mainte.	198.3	198.3	198.3	198.3	198.3	198.3	
Total Cost	231	231	231	231	231	231	
Residual Value						1,567.2	
Net Benefit(Revenue-Cost)	1,354.5	1,354.5	1,354.5	1,354.5	1,354.5	2,921.7	
Discounted Value in 1995							
At the rate of 5%	486.2	463.0	441.0	420.0	400.0	821.7	2,743
At the rate of 10%	183.0	166.4	151.3	137.5	125.0	245.1	-1,046
At the rate of 15%	72.0	62.6	54.4	47.3	41.1	77.2	-2,249
At E.I.R.R.(%)	269.4	249.5	231.0	213.9	198.1	395.6	-0

Benefit/Cost Ratio	
At the rate of 5%	1.29
At the rate of 10%	0.82
At the rate of 15%	0.55

Pavlodar Financial Cash Flow for F.I.R.R.

Pavlodar		Construction Period						
		1997	1998	1999	2000	2001	2002	2003
1. Revenue							102	117
a) Airport Revenue							88	100
b) Aircraft Fuel Tax							15	17
2. Airport Expenses							208	209
a) Personnel Expenses							2	3
b) Operation & Maintenance							206	206
3. Total Fund Expenses	7,771	115	115	2,513	2,513	2,513	0	0
4. Residual Value								
5.1 Revenue(a+b)-Expenses	(FIRR)	-115	-115	-2,513	-2,513	-2,513	-106	-92
5.2 Discounted value at FIRR(%)	-3.23	-119	-123	-2,773	-2,866	-2,962	-129	-115
6.1 Revenue(a)-Expenses		-115	-115	-2,513	-2,513	-2,513	-121	-108
6.2 Discounted value at FIRR(%)	-4.51	-121	-127	-2,886	-3,023	-3,165	-159	-150

Pavlodar	2004	2005	2006	2007	2008	2009	2010	2011
1. Revenue	132	146	188	230	272	314	356	377
a) Airport Revenue	113	125	160	195	229	264	299	316
b) Aircraft Fuel Tax	19	21	28	36	43	50	58	61
2. Airport Expenses	209	210	213	216	219	221	224	227
a) Personnel Expenses	4	4	7	10	13	16	18	21
b) Operation & Maintenance	206	206	206	206	206	206	206	206
3. Total Fund Expenses	0	0	0	0	0	0	0	0
4. Residual Value								
5.1 Revenue(a+b)-Expenses	-78	-64	-25	14	54	93	132	150
5.2 Discounted value at FIRR(%)	-101	-86	-34	21	90	142	209	246
6.1 Revenue(a)-Expenses	-97	-85	-53	-21	11	43	74	89
6.2 Discounted value at FIRR(%)	-140	-129	-84	-35	18	77	142	178

Pavlodar	2012	2013	2014	2015	2016	2017	2018	2019
1. Revenue	398	419	440	461	461	461	461	461
a) Airport Revenue	333	351	368	385	385	385	385	385
b) Aircraft Fuel Tax	65	69	72	76	76	76	76	76
2. Airport Expenses	230	233	235	238	238	238	238	238
a) Personnel Expenses	24	27	29	32	32	32	32	32
b) Operation & Maintenance	206	206	206	206	206	206	206	206
3. Total Fund Expenses	0	0	0	0	0	0	0	0
4. Residual Value								
5.1 Revenue(a+b)-Expenses	169	187	205	223	223	223	223	223
5.2 Discounted value at FIRR(%)	285	327	370	417	431	445	460	475
6.1 Revenue(a)-Expenses	104	118	133	147	147	147	147	147
6.2 Discounted value at FIRR(%)	217	259	304	354	371	388	406	426

Pavlodar	2020	2021	2022	Total
1. Revenue	461	461	461	
a) Airport Revenue	385	385	385	
b) Aircraft Fuel Tax	76	76	76	
2. Airport Expenses	238	238	238	
a) Personnel Expenses	32	32	32	
b) Operation & Maintenance	206	206	206	
3. Total Fund Expenses	0	0	0	
4. Residual Value			1,651	
5.1 Revenue(a+b)-Expenses	223	223	1,875	
5.2 Discounted value at FIRR(%)	491	508	4,401	0.00
6.1 Revenue(a)-Expenses	147	147	1,799	
6.2 Discounted value at FIRR(%)	446	467	5,967	0.00

6.8 Implementation Plan

Contracts for each stage should be signed in a timely manners so as to start the field work before the arrival of severe frost. Otherwise the project shall be delay.

The implementation plan is divided into 2 stages: design stage and construction stage.

A commitment to the project from both countries is needed before design. Normally 6 months of contract negotiation are required prior to signing. Then a consultant would be selected by the Kazakhstan government.

Topographic surveys and soil surveys for detailed design shall start after contraction. A review of traffic demand forecasts shall start simultaneously. Detailed design for contracting construction will take 10 to12 months.

The Japanese government will check the plan and design including project cost. All of the foregoing activities will take a total of 2 years prior to the commencement of construction.

Table 6.8.1 shows the main items of project implementation.

Table 6.8.1 Airport Project Implementation Program

Year / Work Items		1	2	3	4	5
1	Financial Arrangement, Loan Agreement of Project and Contract of Consultant	====				
2	Topographic Survey and Soil Investigation	===				
3	Basic Design and Detailed Design	===	========			
4	Land Acquisition		(===)			
5	Pre-qualification, Tendering and Contract for Construction		== =			
6	Construction Works			========	========	========
7	Test Operation and Flight Check etc.					=

Note: Land acquisition must be done by Kazakhstan, if required.

6.9 Conclusions and Recommendations

6.9.1 Conclusions

The conclusions of the feasibility study on the selected six airports can be summarized as follows:

(1) Operational and other issues

The purpose of the project is to modernize the existing airports to meet international standards and levels of services.

Akmola Airport is planned to serve the new national capital. Specific facilities will be required to service large jet aircraft and greet distinguished visitors, in addition to meeting technical standards and levels of service.

(2) Environmental Issues

The environmental impact analyses indicate that there are unlikely to be any specific adverse impacts resulting from the projects. This is because the projects primarily involve refurbishing existing facilities. Any adverse impacts can be dealt with by installing treatment facilities.

Aircraft noise, however, is a problem specific to airports and the surrounding areas. Noise levels at Almaty airport already exceed national standards. The outdated aircraft currently used in Kazakhstan are the primary causes of these high noise levels and their replacement with modern aircraft will ease the problem. It is also necessary to introduce effective land use control in the surroundings areas to protect the well-being of residents.

(3) Economic Issues

1) The results of the economic and financial analyses, appear in **Table 6.7.7 (1)**. The analyses indicate high levels of economic and financial viability for both Almaty and Akmola. The less favorable situation at the other airports is attributable to lower air traffic demands and lower revenues.

The financial viability of all projects will be enhanced by soft loan funding at low interest rates.

At Aktau, Atyrau, Aktyubinsk and Pavlodar, it will be necessary to increase revenues and reduce costs. Any increases in airport charges, however, need to be carefully formulated to avoid adverse impacts on traffic levels. Some form of governmental financial assistance may be necessary.

2) The airport projects would bring indirect benefits as well as direct economic and financial benefits. The upgraded airports would be clear symbols at Kazakhtan's commitment to market reforms, infrastructure modernization, and a safe and reliable air transportation system. This will encourage foreigners to travel more often by air and promote tourism.

Domestically, upgraded airports will strengthen air transportation links and

promote a sense of national unity and identity. This will be particularly important given the inadequate surface transportation systems.

(4) Priorities

The analyses confirm the overall feasibility of all the airport projects. Since Almaty airport is already being modernized by the Lufthansa consortium, the highest development priority should be accorded to Akmola to serve the new national capital.

6.9.2 Recommendations

It is recommended that the followings measures should be taken to complement an airport modernization programme.

(1) General modernization of the air transport system

Airports are components of the overall air transport system so there should be complementary modernization and enhancement programs for the Air Navigation System, Air Carriers and the Regulatory Regime.

(2) Enhanced airport management

More efficient management is required to fully benefit from facility modernization programs. Services need to be more user orientated and delivered more efficiently. Costs reductions will be required. The government is advised to design any cost reduction programs involving personnel with great care and sensitivity. Appropriate measures include providing alternative employment, retraining and financial remuneration packages.

(3) Financial assistance from governments

Although the processing of soft loans will improve the financial viability of the airport projects, supplementary financial assistance from various levels of government may be required for these airports with low economic and financial viability. These can include subsidies and tax relief.

(4) Understanding Investment Requirements

Considerable foreign investment will be required to implement the projects in the form of equity purchases or loan funding. The owners and managers of Kazakhstan's airports should, therefore, understand the parameters which govern investment decision making. These entail a thorough assessment of the records and risks involved. To foreign investors, the current managerial and financial systems in Kazakhstan often appear unclear and subject to sudden change.

Investors will, therefore, usually require certain conditions to be met prior to making any funding available. For debt financing, the airport owners would have to provide loan guarantees and also part of the actual loan requirements. Investors would also require that adequate management, financial and safety systems be in place.

Soft loans are usually only available from bilateral or multilateral governmental lending institutions. Private investors are likely to apply more stringent loan conditions.

The expected roles of the government would be to provide sovereign guarantees as appropriate for foreign loans, provide tax relief as appropriate, establish viable economic and safety regulatory regimes, and to fund any public service obligations imposed on the airports.

(5) Requirements for individual projects

a) Akmola airport

This airport will serve the new national capital after it has been relocated from Almaty to Akmola. There are, however, few details on the scope and schedule of the actual relocation activities. As these become known, the airport development plan should be reviewed and amended as necessary.

b) Almaty airport

The management of this airport has been transferred to a private company whose development program will be primarily determined by financial considerations. To ensure that the development of this airport is balanced and timely, it is advisable to monitor the development activities of the private company in relation to the plan proposed in this study.

c) Atyrau airport

The rising water levels of the Caspian Sea may require a relocation of the city and airport. Such measures and any other counter measures need to be monitored, and the airport development plan modified accordingly.

(6) Implementation Framework

It is recommended that all of the activities involved in the design stage of project implementation be conducted in accordance with the laws and standards of Kazakhstan, taking local conditions into account, and in full collaboration with Kazakhstan side.

CHAPTER 7

MODERNIZATION OF NATIONAL AIRLINE

CHAPTER 7 MODERNIZATION OF THE NATIONAL AIR CARRIER

7.1 Introduction

7.1.1 Trends Affecting the National Air Carrier and Demand for Air Travel

Following independence in 1991, the economy of Kazakhstan experienced a decline in output, high levels of inflation and reduced consumer demand for all but the basic necessities. During this period there was a dramatic reduction in the demand for air travel. Contributing factors were much lower discretionary incomes, higher rates of unemployment, wage levels which did not keep pace with inflation, and substantial increases in air fares. Because of this situation, the condition of the national air carrier, Kazakhstan Auje Zholy, (hereafter referred to as Kaz Air) progressively deteriorated. While a large part of the airline's decline is linked to general economic conditions, there is also evidence that the airline's management lacks the skills and experience required to operate in a more open, demand driven marketplace.

The demand for air travel in Kazakhstan peaked in 1990 at 13,291 million RPK's. The market remained fairly stable in 1991, but experienced sharp annual declines during the period of 1992 to 1994, in the range of 25% to 33%. This trend continued in 1995 when traffic reached an all time low of only 4,404 million RPK's. The reduction in traffic from 1990 was 66%. During the first six months of 1996 the airline carried 1,568 million RPKs, suggesting a further erosion in traffic by year end.

Notwithstanding the downward trend in traffic, during this period there has been a substantial increase in the number of domestic and international air carriers serving Kazakhstan. The combination of additional competition, increases in capacity, and overall market conditions have had a significant and adverse effect on the financial results of the national air carrier. In 1995 the airline recorded a consolidated net loss of 710 million tenge. During the first six months of 1996, the carrier incurred a net loss of 916 million tenge. In both periods, the airline's non operating expenses were extensive. Financial results are discussed in further detail in **Section 7.3.1**.

7.1.2 Recent Developments Affecting the National Air Carrier

The role of and need for air transportation is significant in Kazakhstan, given the country's large land mass, rugged terrain, dispersed population centers, and limited intermodal links. Transportation and air transportation, in particular, are considered vital to the national interests of the Republic. To promote these interests, the government has issued a number of directives intended to strengthen the air transportation infrastructure and improve the financial condition of the national air carrier.

These initiatives include establishing a civil aviation law and separating the management and control of some functions previously centralized under the Soviet

model. Further measures were taken in April of 1996 when the Prime Minister of the Republic issued Decree No. 533 establishing Almaty Airport, Kaz Avia Stroy and the Academy of Civil Aviation as separate entities. The decree also indicated that a number of other airports would be separated by year end. The full version of Decree No. 533 is contained in **Appendix 7.1.2.a**.

With regard to the national air carrier, the decree resolved to improve the economic and financial position of the National Joint Stock Company "Kazakhstan Airlines" through a restructuring and reorganization carried out through external governing. To achieve this end, the Kazcommertzbank was given the responsibility for managing the airline on an interim basis with Mr. Bektorov R S appointed as the airline's trustee. The decree further mandated that the Kazcommertzbank undertake a three month financial and technical audit of the airline with assistance from the firm of SH&E. On the basis of the final audit report, the State Property Committee, along with the Ministry of Transport and Kazcommertzbank, would reorganize the airline through a merging of all companies except airports. A executive summary of the audit findings are contained in **Appendix 7.1.2.b**.

The major conclusions of the audit were:

1. Kazakhstan's air transportation industry is strategically important to the Republic's national interests.
2. Less than half of the subsidiaries have become Joint Stock Companies or transferred shares to the airline.
3. Because of these legal infractions the national air carrier is not a holding company. The airline does not practice integrated financial management and has no Financial Director.
4. Most of the buildings and fleet of the airline are old and obsolete with little original market value.
5. Managers of the airline signed a number of unprofitable commercial agreements which contravened the advice of the legal department.
6. The airline's accounting system is ineffective with cash distributed among 48 separate bank accounts. The separation of the subsidiaries does not permit adequate financial reporting and controls. The estimated deficit of the airline during the winter period was $4.8 million per month.
7. The airline has sizable debts with various countries and insurance companies, cumulatively estimated at $11.3 M USD. A more precise estimate could not be established because of difficulties in obtaining information from the subsidiary companies.
8. There is no single department responsible for network profitability. Flights are unprofitable because the costs used to establish tariff levels only reflect 20% of actual expenses.
9. The national air carrier operates both scheduled and charter flights. All charters operated in January to May of 1996 were unprofitable, incurring an estimated cumulative loss of $7 million USD.
10. The airline lost share in CIS and international markets during 1995 and 1996. The load factor on the airline's scheduled services declined, while the load factor on charter competitors increased.

The final section of the audit focused on a variety of recommendations relating to short term restructuring measures and government policy.

Following the audit review, Decree No. 1030 was issued on August 20, 1996. The decree reiterated a number of the audit findings relating to the performance and management of the National Joint Stock Company Kaz Air. A closed joint stock company, "Air Kazakhstan", was established to assume the role of a new national air carrier. A statutory fund was set up to transfer various assets, including fleet, and property from Kaz Air to "Air Kazakhstan".

In accordance with the decree's mandate, the new airline would provide international and domestic passenger flights, charter passenger flights, and cargo flights. The airline would also be responsible for providing other routine airline related services such as catering, ground handling, aircraft maintenance, fueling, etc.

The Ministry of Transport and Communications was directed to develop regulation which would consider the interests of the State and the National Air Carrier. Private airlines would be permitted to operate competitive scheduled services.

By September 10th, the Ministry and State Property Committee would complete the separation of the airports from the regional airline companies. Airports having economic and strategic importance would become open joint stock companies (Cities of Aktyubinsk, Akmola, Aktau, Atyrau, Karaganda, Kustanay, Pavlodar, Petropavlovsk, Uralsk, and Shimkent). As of November, 1996 the airports in Karaganda and Shimkent had yet not taken steps to separate. In the remaining states, the airlines and airports would remain together and provide domestic passenger and cargo transportation, as well as conduct agricultural services and aerial surveys.

The decree further stipulated that the State Property Committee's Agency of Company Reorganization must submit a reorganization proposal for the NJSC Kaz Air within 30 days. The national air carrier would be assigned the liabilities of the regional avias and Mr. Nazamutdinov would be appointed as Kaz Air's Authorized Manager. As of November, there were no further announcements as to how, or if, the air carrier had been "reorganized".

The complete text of Decree 1030 is set out in **Appendix 7.1.2.c** and includes details on the transfer of fleet, assets, property and authorized representatives of the regional air companies and State Property Committee. The Decree did not specify the affect of the reorganization on the existing management and staff of Kaz Air.

Mr. Bektorov, the previous trustee of Kaz Air, was appointed as the Chairman of "Air Kazakhstan" soon after the decree was issued. A small management team, comprised mainly of individuals involved in the interim audit, was assembled. During the second field visit, this team was developing specifications for the new air carrier, including an understanding of its management, organizational, operational, marketing, scheduling and fleet needs. It is believed that "Air Kazakhstan" received an operating certificate in October and is now applying for

an operating license. The matters of certification and licensing are covered in greater detail in **Chapter 8**. The new national air carrier hopes to commence operations in the first part of 1997.

To avoid misunderstanding, the use of the name Kaz Air and the term national air carrier in **Chapter 7** will be refer to the national air carrier established by Decree in October, 1993. The name "Air Kazakhstan" and the term new national air carrier will refer to the closed joint stock company established in Decree No 1030 dated August 20, 1996.

7.2 Review of Air Transportation Market in Kazakhstan

7.2.1 Market Demand and Segmentation

During the former Soviet Union, demand for air travel was excessively high. Air travel was considered a social benefit and widely subsidized by the State. Earlier studies estimate that well over half of CIS citizens took annual vacations which were either fully, or partially, paid by employers. Fuel was also supplied by the State at prices a fraction of world market levels. Air fares in the USSR were generally amongst the lowest in the world. A 1993 World Bank study found that air travel ranked equally with many food staples as one of the most affordable commodities in the Soviet Union.

When air travel market peaked in Kazakhstan in the 1990 to 1991, the national air carrier operated regularly with load factors in the range of 90% and higher. An influx of new international competition began in 1992. Independent air carriers started to emerge in 1993. As a result of these new airline carriers, along with the establishment of social and economic links between Kazakhstan and other areas of the world, new segments of air travel began to develop. In addition to the traditional business and leisure travel, the citizens of the republic also began to travel for purposes of migration and purchasing of goods outside the country. Each of these developments significantly influenced the level of competitive services and the evolution of Kaz Air's international route structure in recent years.

7.2.2 Competition

(1) Overview of Competition

During the era of the former Soviet Union, Aeroflot provided all international and domestic air service within Russia. International services were only available from Moscow or Tashkent. In each of the republics, there were smaller regional airlines of Aeroflot who provided services within local, domestic markets and to other points within the CIS. Because of the political and structural nature of the market, there was no domestic or international competition.

Since independence, the level of competition and capacity in Kazakhstan has risen dramatically in relation to the market size. New services have been introduced by

international scheduled carriers, as well as a sizable number of "independent carriers". This influx of competition has had a serious impact on the national air carrier, even more so because of the coincident decline in demand for air travel. As of September, 1996 more than 65 air companies have been identified as providing services within or to/from points outside Kazakhstan. Another 20 carriers are designated, but are not currently operating. **Table 7.2.2.1** provides a general overview of this competition.

Table 7.2.2.1 Carriers Licensed or Designated to Operating Within and To/From Kazakhstan

Type of Carrier	Type of Service	Region of Service	Number of Airlines
International	Scheduled & Cargo	Central, Eastern Europe, Middle East & Asia	8
Independents	Charter & Cargo	Central Europe, CIS Middle East, & Asia	20
ALTK & Regional Avias	Scheduled, Cargo & Charter	Within Republic & CIS	20
CIS Regional and National Carriers	Scheduled & Cargo	To/From CIS	18
Total			66

Source: Compiled from information provided by Kazakhstan Airlines and the Civil Aviation Department

(2) Domestic

There are also indications that new domestic operations are developing. For example, the September 1996 schedule on file with the CAD listed Asia Service as operating flights from Akmola, Aktau, and Atyrau to Almaty. Skyservice also had flights from Akmola to Almaty. It could not be confirmed if these were international flight extensions or for the purpose of carrying local passengers. In addition, a May report in the Kazakhstanskaya Pravda announced that,

> "Transaero and the Kazakhstan-Caspian Shelf oil consortium are working together to establish a new airline, Asia Service Airlines. The airline would serve Atyrau and Aktau, the oil centers in western Kazakhstan. The air carrier is also interested in serving other domestic points within Kazakhstan, and operating international services to Britain, Germany, Turkey, Malaysia, Italy and Greece on both a scheduled and charter basis. The airline would work closely with Kazakh and foreign oil companies to transport workers and cargo to and from the oil fields."

It is not known if these links have actually been established.

Table 7.2.2.2 Domestic Competition Almaty

Origin	Airline Code	Carrier	Flight #	Days of Week							Aircraft
				1	2	3	4	5	6	7	
Aknola	K4	Kaz Air	1808	1				1	1		AN24
Aknola	K4	Kaz Air	1808		1	1	1	1	1	1	AN24
Aknola	K4	Kaz Air	1822	1	1		1	1	1		AN24
Aknola	S3	Skyservice	120						1		TU154
Aknola	Y3	Asia Service	1708	1			1				TU134
Aknola	VV	Aerosweet	401				1				B737
Aktau	K4	Kaz Air	208	1							TU154
Aktau	K4	Kaz Air	4198			1		1		1	TU134
Aktau	K4	Kaz Air	4194				1				TU134
Aktau	K4	Kaz Air	4292	1		1			1		TU154
Aktau	K4	Kaz Air	1726				1		1		YAK42
Aktau	Y3	Asia Service	1706	1							TU134
Atyrau	K4	Kaz Air	104			1					TU134
Atyrau	K4	Kaz Air	4288		1			1		1	TU154
Atyrau	K4	Kaz Air	104							1	TU134
Atyrau	Y3	Asia Service	1704		1			1			TU134
Kustanai	K4	Kaz Air	106						1		TU154
Kustanai	K4	Kaz Air	1026	1	1	1	1	1	1	1	AN24
Kustanai	K4	Kaz Air	1004				1			1	AN24
Kustanai	S3	Skyservice	118	1							TU154

Source: Civil Aviation Department

(3) Independent Air Carriers

During the period of Soviet rule there were no independent airlines operating within Kazakhstan. Sayahat Airlines, which received certification in 1990, is believed to be the only other air carrier in Kazakhstan which predates Independence. In addition to the national air carrier and its regional avias, there are seventeen "independent" air carriers with operating certificates in Kazakhstan. It is understood that these airlines do not possess scheduled licenses or serve domestic markets in Kazakhstan. The independents primarily operate charter and cargo services to international and other CIS destinations. Most of the independents have only been operating since 1993. In addition to the 17 independent air carriers, it was reported that two other air carriers received operating licenses in 1996.

Table 7.2.2.3 Independent Air Companies of Kazakhstan

Airline	Home Base
ALTI	Almaty
LIP-Avia	Aktyubinsk
Sayahat	Almaty
Azamat	Almaty
Aeroservice	Almaty
LTC - 405 GA	Almaty
Orion Avia	Almaty
Aero-Eco	Almaty
Avluga-Trans	Aktyubinsk
Asia Service Auje Zholy	Almaty
Vilga Avia Service	Uralsk
Aero-Nur	Almaty
SAN	Almaty
Zhana-Arka	Almaty
VIP-Aero	Almaty
Aeroservice Sabit	Almaty
Trans-Asia	Almaty

Source: Kaz Air

(4) Regional

As of May 1996, the airline portion of the national air carrier consisted of the Almaty Technical Flying Complex and the nineteen regional avias listed in Table 7.2.2.4. Under the terms of Decree 1030, the avias and airports in Burandai,

Ust-Kamenogorsk, Zhambul, Semipalatinsk, Kokchetau, Kzyl-Orda, Taldy-Kurgan, Arkalyk and Zhezkazgan will remain together. The airlines at these locations will operate independently from the national air carrier in their respective regions. It is assumed that these airlines will only operate domestic flights, but may compete with the new national air carrier on some routes.

Table 7.2.2.4 Regional Avias of the National Air Carrier, May 1996

Airline	Region
Burundai	Burandai
Uralsk(Ak-Zhol)	Uralsk
Aktyubinsk("Aktyubinsk Airport")	Aktubinsk
Karaganda("Karaganda Avia")	Karaganda
Kostanai("Kostanai Avia")	Kostanai
Atyrau("Atyrau Avia")	Atirau
Ust-Kamenogorsk("Vostok Avia")	Ust-Kamenogorsk
Shimkent	Shimkent
Zhambul("Zhambul Avia")	Zhambyl
Akmola("Akmola Avia)	Akmola
Semipalatinsk	Semipalatinsk
Kokshetau("Kokshetau Avia")	Kokshetau
Pavlodar("Irtysh Avia")	Pavlodar
Petropavlovsk ("Petropavlovsk" Avia)	Petropavlovsk
Kzyl-Orda("Kzyl-Orda Avia")	Kzyl-Orda
Taldy-Kurgan("Taldy-Kurgan Avia")	Taldy-Kurgan
Arkalyk("Arkalyk Avia")	Arkalyk
Aktau	Aktau
Zhezkazgan	Zhezkazgan

Source: Kaz Air

(5) CIS

Due to shared economic and cultural interests, CIS travel has historically been, and continues as, a major market in Kazakhstan. Tourists Records provided by the Committee of Statistics and Analysis indicate that 15% of the travel outside the Republic in 1995 was to points in the CIS and Russian Federation. CIS airlines which were licensed to serve Kazakhstan as May 1996 are provided in **Table 7.2.2.5.1**.

Based on schedules filed with the Civil Aviation Department, there are some 18 carriers operating from points in the CIS to Almaty. Several stop at intermediate domestic points within Kazakhstan. However, under the terms of the bilateral with Russia, only Aeroflot and Transaero have rights to fly to interior points of

Kazakhstan. These points are Almaty, Karaganda, Akmola, Atyrau and Aktyubinsk. From Almaty the national air carrier operates to Kaliningrad, Kiev, Moscow, Samara. St. Petersburg, and Tashkent.

Table 7.2.2.5.1 CIS Airlines Serving Kazakhstan

Airline	Base
Ural Airlines	Ekatherinberg, Russian Federation
Osh Air	Osh, Kyrgistan
Samara Air Company	Samara, Russian Federation
Issyk-Kol Air Company	Karakol, Kyrgistan
Tochikiston Air Company	Dushanbe, Tajikistan
Belavia Airlines	Minsk, Belarus
Arax Air Company	Erevan, Armenia
Kaliningrad Air	Kaliningrad, Russian Federation
Uzbekistan Airlines	Tashkent, Uzbekistan
Aerosweet Airlines	Kiev, Ukraine
Siberia Air Company	Novosibirsk, Russian Federation
Aeroflot Airlines	Moscow, Russian Federation
Krasnoyarsk Avia	Krasnoyarsk, Russian Federation
Donavia Air Company	Rostav on Dom, Russian Federation
Pulkovo Air Company	St. Petersburg, Russian Federation
Transaero Air Company	Moscow, Russian Federation
Ingush Airlines	Nazran, Russian Federation
Turkmenistan Airlines	Ashgabad, Turkmenistan
Paranobel Company	Baku, Azerbajan

Source: Kazakhstan Airlines

The national air carrier has competition in each CIS market where it operates. **Table 7.2.2.5.2** provides a comparison of CIS flights operated by all carriers to Almaty as of September, 1996. Kaz Air's overall share of CIS capacity is 31%. Although the national air carrier has a 40% capacity share in competitive markets, it is considered to have a weaker market position in two major markets, Tashkent and Moscow. The national air carrier only operates one flight a week to Tashkent, while Uzbekistan and Turkish Airlines jointly operate six flights a week. Kaz Air actually has more frequency to Moscow, but Transaero operates larger, more modern B-757 equipment. Uzbekistan Airlines, Transaero, and Aerosweet are considered the strongest scheduled CIS competition. It is also believed that some charters being offered to points in the CIS, but charter information is not centrally

available. In addition to the Almaty based airline, 15 points in the CIS are served by the regional airlines. CIS carriers also operate to Akmola, Shimkent, Uralsk, Aktyubinsk and Kokchetau. The degree of competition in CIS markets is expected to grow over time, as the air transportation markets in each of these countries develops further.

Table 7.2.2.5.2 Service Between Almaty & CIS Points - September, 1996

Airline	Code	Destination	Aircraft	Seats	Weekly Flights	Weekly Seats
Krasnoyarsk	7B	Krasnoyarsk	TU154	160	1	160
Belavia	B2	Minsk	TU154	160	1	160
Donavia	D9	Rostov on Don	TU134	76	1	76
Arax	E5	Erevan	TU154	160	1	160
Samara	E5	Samara	TU134	76	1	76
Uzbekistan	HY	Tashkent	TU154	160	1	160
Uzbekistan	HY	Tashkent	TU154	160	1	160
Uzbekistan	HY	Tashkent	YAK40	36	1	36
Uzbekistan	HY	Tashkent	TU154	160	1	160
Ingush	IN	Astrahan	YAK42	120	1	120
Ingush	IN	Nazran	YAK42	120	1	120
Osh Kyrgistan	K2	Osh	YAK40	36	2	72
Paranobel	K3	Baku	TU134	76	1	76
Mongolian	K7	Yakutsk	TU154	160	1	160
Kaliningrad	KD	Kaliningrad	TU154	160	1	160
Kaliningrad	KD	Kaliningrad	TU154	160	1	160
Pulkov Airlines	PL	St. Petersburg	IL86	350	1	350
Siberian	S7	Novosibirsk	TU154	160	1	160
Turkmenistan	T5	Ashagabad	YAK42	120	1	120
Tajikistan	TD	Dushanbe	YAK40	36	3	108
Turkish	TK	Tashkent	A310	172	2	344
Transaero	UN	Moscow	B757	186	7	1302
Transaero	UN	Moscow	B757	187	1	187
Aerosweet	VV	Kiev	B737	112	1	112
Asia Service	Y3	Novosibirsk	TU134	76	1	76
Subtotal					35	4775
Kaz Air	K4	Kaliningrad	TU154	160	2	320
Kaz Air	K4	Kiev	TU134	76	1	76
Kaz Air	K4	Moscow	TU134	76	2	152
Kaz Air	K4	Moscow	TU154	160	7	1120
Kaz Air	K4	Samara	TU134	76	1	76
Kaz Air	K4	St. Petersburg	TU154	160	2	320
Kaz Air	K4	Tashkent	TU134	76	1	76
Subtotal					16	2140
Total All Carriers					51	6915
Kaz Air Share					31.4%	30.9%

Source: Schedules filed with CAD and Timetable from Central Asia Tourist

(6) International

The only growth market in Kazakhstan since Independence is the international air travel market. The growth in traffic is due to the establishment of new foreign investment interests, supported by a liberal Air Services Agreements (ASA's) policy on the part of the government. **Table 7.2.2.6.1** indicates that there were 276,000 international departures at Almaty airport in 1995, or a growth of 267% since 1993. The growth in capacity has actually been much greater. The only international operators in 1993 were Xiajiang, Mongolian, Turkish and Lufthansa. It is estimated that scheduled capacity has grown at more than twice the rate of traffic.

Table 7.2.2.6.1 Annual Departing Passengers (000) - Almaty Airport

Year	Total	Initial	Transit	International
1993	1279.5	1173.4	29.1	75.6
1994	907.1	672.2	16.5	215.8
Change 94/93	-29.2%	-42.7%	-43.3%	185.4%
1995	858.8	541.2	39.7	277.4
Change 95/93	-52.1%	-53.9%	36.4%	267.0%

There were eight international air carriers operating at Almaty in summer 1996. They offered approximately 2,800 weekly seats on 16 flights to eight destinations. Lufthansa, KLM, and Austrian Airlines also have code share agreements with major partners on the Almaty route. The national air carrier had an equal number of flights and a 52% share of the scheduled seat capacity. **Tables 7.2.2.6.2** and **7.2.2.6.3** compare international services offered to Almaty during the summer and winter of 1996, respectively.

In addition to the scheduled services detailed in **Table 7.2.2.6.3**, several new carriers recently established international services to Kazakhstan. A new carrier named Europe Elite was listed in the September 1996 OAG as operating three times weekly from London (Heathrow Airport) to Almaty with B-757 aircraft. The airline also operates a service to Atyrau. Sky Service is another airline which commenced services between Almaty and both Frankfurt and Hanover. These flights were on file with the Civil Aviation Department, but were not listed either in the OAG or travel agency time tables. There are also designated carriers who are not currently exercising traffic rights who may do so in the future. These include British Airways, Swissair and Singapore Airlines.

As of October 1996, the scheduled competition has increased frequency, while Kaz Air has reduced the overall number of international flights operated. Lufthansa, Pakistan, and Turkish have each added one flight a week. Kaz Air has added services to Athens, Budapest, and Meshhad, but suspended operations to Frankfurt, Hanover, Sharjah, Delhi and Vienna. Within three months, Kaz Air's seat share dropped from 52% to 21%.

Table 7.2.2.6.2 International Scheduled Services Almaty- Summer 1996

Airline	Code	Destination	Aircraft Type	Seats	Weekly Flights	Weekly Capacity
KLM Royal Dutch	KL	Amsterdam	B-767	224	2	448 (1)
Lufthansa	LH	Frankfurt	A-310	169	4	676 (2)
Pakistan International	PK	Islamabad	TU-154	160	1	160
Turkish	TK	Istanbul	A-310	200	3	600
Iran Air	IR	Teheran	B-727	140	1	140
Miat Mongolian	OM	Ulan Bator	B-727	140	1	140
Xiajiang Airlines	XO	Urumqi	TU-154	160	2	320
Austrian Airlines	OS	Vienna	A-310	169	2	338 (3)
Subtotal					16	2822
Kazakstan Airlines	K4	Beijing	TU54	160	2	320 (4)
Kazakstan Airlines	K4	Budapest-Vienna	TU54	160	1	160 (4)
Kazakstan Airlines	K4	Delhi	TU54	160	1	160 (4)
Kazakstan Airlines	K4	Frankfurt	IL86	350	1	350 (4)
Kazakstan Airlines	K4	Frankfurt	B-747	375	1	375 (4)
Kazakstan Airlines	K4	Hanover	IL86	350	2	700 (4)
Kazakstan Airlines	K4	Istanbul	TU54	160	2	320 (4)
Kazakstan Airlines	K4	Sharjah	TU54	160	2	320 (4)
Kazakstan Airlines	K4	Tel Aviv	TU54	160	1	160 (4)
Kazakstan Airlines	K4	Ulgii	AN24	50	2	100 (4)
Kazakstan Airlines	K4	Urumqi	TU34	76	1	76 (4)
Kazakstan Airlines	K4	Vienna	TU54	160	1	160 (4)
Subtotal					16	3041
Total All Carriers					32	5863
Kaz Air Share					50.0%	51.9%

(1) Offer Business/Economy Class. Have codeshare with Northwest
(2) Offer/First/Business/Economy Class. Have codeshare with United
(3) Offer Business/Economy Class. Have codeshare with Swiss Air
(4) All Economy Class

Source: Kazakstan Airlines

Table 7.2.2.6.3 International Scheduled Services Almaty - Winter 1996

Airline	Code	Destination	Aircraft	Seats	Weekly Flights	Weekly Capacity
KLM Royal Dutch	KL	Amsterdam	B-767	224	2	448
Lufthansa	LH	Frankfurt	A-310	169	5	845
Pakistan Airlines	PK	Islamabad	TU-154	160	1	160
Pakistan Airlines	PK	Karachi	TU-154	160	1	160
Turkish Airlines	TK	Istanbul	A-310	200	4	800
Iran Air	IR	Teheran	B-727	140	1	140
Xinjiang	XO	Urumqi	TU-154	160	2	320
Austrian Airlines	OS	Vienna	A-310	169	2	338
Europe Elite		London	B-757	186	3	558
Sky Service	S3	Frankfurt	TU-154	160	1	160
Sky Service	S3	Frankfurt	TU-154	160	1	160
Subtotal					23	4089
Kaz Air	K4	Athens	TU-154	160	1	160
Kaz Air	K4	Budapest	TU-134	76	2	152
Kaz Air	K4	Budapest-Vienna	TU-134	76	1	76
Kaz Air	K4	Beijing	TU-154	160	1	160
Kaz Air	K4	Istanbul	TU-134	76	2	152
Kaz Air	K4	Meshhad	TU-134	76	1	76
Kaz Air	K4	Tel Aviv	TU-154	160	1	160
Kaz Air	K4	Ulgii	AN24	50	2	100
Kaz Air	K4	Urumqi	TU-134	76	1	76
Subtotal					12	1112
Total All Carriers					35	5201
Kaz Air Share					34.3%	21.4%

Note: Changes from Summer Schedule include:
(1) Lufthansa increase from four to five flights weekly
(2) Pakistan Airlines add once a week service to Karachi
(3) Turkish Airlines increase from three to four flights weekly
(4) Miat Mongolian suspend service during winter period to Ulan Bator
(5) Kaz Air add once a week service to Athens
(6) Kaz Air suspended twice weekly service Frankfurt, Hanover and Sharjah
(7) Kaz Air suspend once a week service to Delhi and Vienna
(8) Kaz Air add twice weekly service to Budapest
(9) Kaz Air add once a week service to Meshhad
(10) Kaz Air downgauge Istanbul and Budapest-Vienna from TU54 to34
(11) Europe Elite add three weekly B-757 to London, Heathrow
(12) Sky Service add once weekly to Frankfurt and Hanover with TU154

Source: Civil Aviation Department and OAG, September 1996

(7) Charter and Shop Tourist

As indicated in **Section 7.2.2 (3)**, a majority of the "independent" air carriers operate charter services, a common practice in Kazakstan and a number of surrounding countries. The charters appeared to be organized on a regular basis by both the air carriers and tour organizers. Among the more popular "shop tourist" destinations are Istanbul, Jeddah, Sharjah and Delhi. The purpose of the charters is to transport individuals who buy consumer goods for resale in Kazakhstan. Azamat, Sayahat, Aeroservice, Asia Service and SAN are believed to own their own aircraft, while Zhana-Arka and Turkestan wet-lease TU-154 and IL-86 aircraft from other air carriers, including the national air carrier.

Charters are also operated by air carriers registered in other countries. The CAD does not record outbound charter movements and there is no central industry source of distribution. For these reasons, the total number of carriers and level of capacity serving this market segment cannot be estimated. However, a partial listing of carriers offering shop tourist charters is contained in **Table 7.2.2.7.1**.

Table 7.2.2.7.1 Shop Tourist Operators and Destinations

Destination	Airline	Aircraft Type
Istanbul	Jana-Arka	TU-154
	Turkestan	IL-86
	Asia service	
	Azamat	
	San	
Delhi	Jana-Arka	TU-154
Seoul	Kazakhstan Auje Zholy	TU-154
Athens	Kazakhstan Auje Zholy	TU-154
Sharjah	Kazakhstan Auje Zholy	TU-154
	Jana-Arka	IL-86
	Turkestan	
	Asia service	
	San	
Karachi	Kazakhstan Auje Zholy	TU-154
	Zhana-Arka	Boeing-737
Warsaw	Aero-service Cargo	IL-86

Source: Kaz Air

Shop tourism charters are operated on a number of routes which are designated as scheduled operations, including many of those of the national air carrier. Kaz Air

has attempted to arrest this competition by also offering charters to these destinations. Some scheduled markets now have more charter capacity than scheduled services.

A review of the Almaty-Istanbul market provides an excellent illustration of how the shop tourist phenomenon has affected Kaz Air's share of market. Istanbul is a popular shop charter destination, also served by Turkish Airlines and Kaz Air on a scheduled basis. Turkish began serving this route in March 1992 with one weekly 140 seat B-737 aircraft. Kaz Air also offered once a week service with a TU-154 aircraft. By mid 1996, the scheduled capacity had grown to more than 900 weekly seats. However, the total weekly capacity is approximately 4500 seats, with almost 80% offered on charters. Kaz Air offered both scheduled and charter services, with approximately one third of the capacity in each segment as of summer 1996.

Turkish Airlines, on the other hand, does not participate in the charter market. The airline's strategy has been to focus on the high yield scheduled business traveler. The airline uses A-310 aircraft with a business class product. As of October, 1996 Turkish Airlines increased from three to four weekly flights, while the national air carrier's downgauged from TU-154 to TU-134 equipment. Kaz Air's share of scheduled capacity decreased from 35% to 16% in the period July to October, 1996.

In addition to the issue of capacity, the national air carrier's price structure is not competitive with either the scheduled or charter operators. Because the national air carrier does not want to undermine its scheduled price structure, the same fares apply to both scheduled and charter services. This results in charter flights priced some 50% to 100% above and scheduled fares priced some 100% to 200% below the competition. The airline offers lower scheduled fares because it does not have a premium product and its overall service standards are lower than Turkish Airlines. Schedules and fares in this market for Summer 1996 are provided in **Table 7.2.2.7.2.**

(8) Cargo

Sayahat in an independent airline with an operating certificate since November, 1991. While the certificate provided the air carrier with rights to perform all types of air transportation, it is believed the airline only operates cargo services. Sayahat owns six IL-76 aircraft and is based in Almaty.

Lufthansa is the only carrier at Almaty offering scheduled cargo services. Other non-scheduled cargo flights are offered by Kaz Air, Pakistan International Airlines and KLM. As indicated previously, some of the independent carriers also operate cargo services and a significant amount of cargo is carried on shop tourist charters.

Table 7.2.2.7.2 Comparison of Scheduled and Charter Flights and Fares Almaty-Istanbul, Summer 1996

Airline	Aircraft Type	Seats	Weekly Flights	Weekly Capacity	Percent of Total	Charter Price CIS OW	CIS RT	Foreign OW	Foreign RT
Charter Flights									
Kaz Air	IL-86	350	4	1400	39.5%	$250	$450	$400	$600
Kaz Air	TU-154	160	1	160	4.5%	$250	$450	$400	$600
Jana Arka	TU-154	160	6	960	27.1%	$165	$240	$250	$350
Turkestan "Kvadratur"	IL-86	350	2	700	19.8%	$180	$260	$250	$350
Azamat	TU-154	160	2	320	9.0%	$165	$225	$220	$320
Total Charter			15	3540	100.0%				
Scheduled Flights									
Turkish Airlines	A-310	200	3	600	65.2%	NA	NA	$870	$1,625
Kaz Air	TU-154	160	2	320	34.8%	$250	$450	$400	$600
Total Scheduled			5	920	26.0%				
All Carriers			20	4460					
% Charter Capacity				**79.4%**					

Note: Turkish offers Business Class Fares of $1000 each way and Excursion of $900 round trip

Source: Kazakhstan Airlines

7.2.3 Government Policy Overview

(1) Bilateral Air Services Agreements

The framework for two countries to establish direct air services under the multilaterally based Chicago Convention is through the negotiation of a bilateral Air Services Agreement (ASA). Bilateral agreements specify route rights, and terms and conditions, and are predicated on the exchange of a "balance of benefits". Because a bilateral is a form of trade pact, both the nations and its air carriers should derive equal benefits from the agreement.

There are seven different types of route rights which may be granted. These rights are identified as "freedoms of the air" and are further defined in **Appendix 7.2.3**. In addition to specifying the routes or cities to which the air carriers may fly, other terms and conditions in the bilateral include:

- the level of capacity which can be offered (number of flights, total number of seats, or even type of aircraft)
- range of fares which may be offered and tariff approval regime
- traffic rights between and beyond 3rd countries
- other airline operating considerations, such as ground handling, display in reservations systems and airport access

In addition to the actual air service agreement, there may also be commercial agreements between the air carriers of each country. Commercial agreements may either be established at the voluntary discretion of the air carrier or be a mandatory requirement of the air service agreement. Commercial agreements may take a variety of forms and cover a wide range of areas such as schedule coordination, joint marketing and product distribution, and pooling of revenues and costs. The latter is designed to ensure that each of the designated carriers benefit equally from the bilateral agreement. In instances where one of the designated carriers is unable to provide scheduled service, there are provisions such as royalty payments and purchasing blocks of seat arrangements which permit the carrier not providing services to derive economic benefit.

The government of Kazakhstan position has taken a liberal posture in establishing air services agreements. The government has authorized, approved, or ratified some 35 bilateral Air Services Agreements since 1991. Twelve of these agreements are with CIS countries with the balance outside the CIS. Air services are operated by one of the designated carriers in nine CIS and fourteen non-CIS countries. **Table 7.2.3** summarizes the status of the Air Services Agreements in effect between Kazakhstan and other countries.

Table 7.2.3 - Summary and Status of Bilaterals with Kazakhstan

Status	Country	Effective Date
Authorized	Holland	May 26, 1993
Authorized	Poland	June 27, 1995
Authorized	United Arab Emirates	May 02, 1995
Authorized	France	October 21, 1994
Authorized	Scandinavia	April 26, 1996
Authorized	Slovenia	Not Available
Authorized	Bulgaria	Not Available
Authorized	Malaysia	May 09, 1996
Authorized	Armenia	February 10, 1995
Authorized	Tajikistan	October 26, 1995
Authorized	Turkmenistan	May 07, 1996
Authorized	Azerbaijan	July 05, 1995
Authorized	Latvia	Not Available
Signed	United Kingdom	March 21, 1994
Signed	India	September 10, 1993
Signed	Iran	May 15, 1993
Signed	Pakistan	February 16, 1992
Signed	Turkey	May 01, 1993
Signed	Finland	February 07, 1996
Signed	Germany	March 15, 1996
Signed	Switzerland	August 05, 1993
Signed	Thailand	May 03, 1996
Signed	Singapore	May 30, 1996
Approved	Austria	August 31, 1995
Approved	Hungary	March 09, 1995
Approved	Israel	August 30, 1995
Approved	China	October 18, 1993
Approved	Mongolia	October 27, 1993
Approved	Belarus	September 16, 1992
Approved	Georgia	June 01, 1993
Approved	Kyrgistan	February 18, 1994
Approved	Lithuania	October 20, 1993
Approved	Uzbekistan	May 25, 1994
Approved	Ukraine	March 25, 1993
Approved	Russia	May, 1994

None of the current bilateral agreements grant 3rd country traffic rights, such as 5th and 6th freedom, or cabotage. There are also no mandatory commercial agreements specifying areas of cooperation between the designated carriers. Civil aviation representatives indicate that commercial agreements are at the discretion of the airlines. In October 1996, discussions were underway with KLM Royal Dutch Airlines regarding a potential seat block arrangement and royalty payment to Kaz Air for each passenger carried on KLM's services. It is believed that the discussions were initiated by KLM because of the airline's interest in increasing flight frequencies.

(2) Carrier Certification

While only Kaz Air and Sayahat are licensed to provide scheduled services, there were twenty or more independent air carriers with licenses to operate charter and cargo services as of October 1996. Based on interviews with the air carrier and civil aviation officials, it could not be confirmed whether there is a prescribed procedure or legislation in place, specifying the criteria that an air carrier must meet to be granted an operating license. This practice is contrary to prevailing transport policy in most countries, where there are stringent standards which must be met relating to management and financial fitness, and safety.

(3) Charters

In addition to the matter of certification, there appears to be no ongoing regulation or monitoring of charter operations after the license has been issued. Charter operators are also not subject to any filing requirements once the license is obtained. As a result, neither representatives at the CAD or Kaz Air could provide a comprehensive understanding of the size of this market sector. Outbound charters are not recorded. Inbound charter movements are registered, however, presumably to meet entry requirements and facilitate flight clearance.

A number of issues have surfaced with respect to the safety and financial solvency of the "shop tourist" charter operations. In May of 1996, there were several public reports of serious, near catastrophic safety incidents that prompted investigations by civil authorities. The audit conducted by the Kazcommertzbank concluded that essentially all of the charters services provided by the national air carrier in 1996 were unprofitable, because the charter operators were in arrears in payment.

(4) Safety

The subject of safety is discussed in detail in **Chapter 8**.

(5) Air Transportation Reform

Since the national air carrier was established in October 1993, the government of Kazakhstan has issued a number of measures intended to restructure Kaz Air and strengthen the overall air transportation sector. These are discussed in detail in **Section 7.1** and include separating the navigational services, establishing air law, expanding the role of civil aviation, separating some of the major airport and airline operations, placing Kaz Air under the management of a trustee, and establishing "Air Kazakhstan" as a new national air carrier.

7.2.4 Conclusions

The air transportation market in Kazakhstan is highly saturated competitively, in relation to the Republic's population base, current economic climate and level of demand for air travel. This is particularly true in the case of international and CIS markets. While more stable domestically, new carriers are also starting to emerge.

As indicated in the interim audit, Kaz Air's market share in CIS and international

routes has declined in recent years. There are number of factors contributing to this decline. On scheduled services, the number of new international air carriers and destinations have increased, and more established carriers are increasing frequency and capacity. Lufthansa, Austrian Airlines and KLM all operate into large gateway hubs in central Europe, code share with global airline partners, offer business class products with an overall superior cabin service and operate western aircraft with greater passenger appeal. The latter not only relates to comfort and noise, but a growing perception by passengers that western aircraft are more safe. This concern is likely to increase, given the high number of air safety incidents and catastrophes involving fleet manufactured in the former USSR in recent years. The product offered by the national air carrier is not competitive in any of these areas.

Another significant factor affecting Kaz Air's position is the emergence of independent air carriers who operate shop tourism charters. Many of the charters are operated on routes with scheduled services, including those served by the national air carrier. The entry of these carriers has created a high degree of market fragmentation which has been compounded by the national air carrier's response to this market segment. The other scheduled carriers have chosen not to participate in this low yield market and continued to build a frequency product, offering a premium service at premium levels. Kaz Air, however, has attempted to participate in both markets segments, increasingly diverting flights from its schedule into charter operations. The net effect on the airline is a diminishing share of overall traffic, including higher yielding business traffic.

The government of Kazakhstan has taken a rather liberal posture in providing open access to foreign carriers expressing interest. However, there has been limited use of widely accepted commercial levers to ensure a "balance of benefits" or a "level playing field" for the national air carrier.

With respect to licensing of the "independent air carriers", no formal licensing process appears in place to ensure these airlines meet various tests of management fitness, financial solvency and safety. Furthermore, following the initial certification, these operators are not subject to any regulation, which is reason for concern, particularly in the area of safety. Both these operators and Kaz Air have had several serious safety incidents in the past year. Despite this, no comprehensive state sponsored safety program has yet been implemented to ensure compliance.

Although there have been numerous measures designed to restructure the air transportation industry and stabilize the national air carrier since 1995, these steps have not, either individually or collectively, constituted a comprehensive strategy for air transportation reform. The recent establishment of "Air Kazakhstan" as a new national air carrier is, therefore, viewed as a rather positive development. The manner in which the new airline has been structured, along with other recent reform, eliminates a number of serious impediments. "Air Kazakhstan" is organized to operate as a separate, integrated airline entity, unencumbered with the substantial debt of its predecessor.