

## **2.3 National Macroeconomic Policy and Development Plan**

### **2.3.1 National Macroeconomic Policy**

After independence in 1991, the Government of Uzbekistan embarked on a gradual reform of the economic system from a centralized planned economy to a market-oriented economy and is implementing the policies as described below.

#### **(1) Policy on Economic Reforms**

Since the collapse of the former Soviet Union, Uzbekistan has suffered from an economic contraction and a decline in industrial production. In the middle of 1994, several Presidential Decrees and Resolutions of the Government were promulgated to step up the pace of its reform plan. Their purpose is to create the legal foundation for the market economy, introducing tighter monetary policies, expanding privatization, reducing the role of the state in the economy, and improving conditions for foreign investors.

Thereafter, financing assistance from major multilateral funding organizations and bilateral donors has been made available for the development of various projects. Further implementation measures for these reform plans, including fee legislation and administration system, the monetary control system, trade and payments, and privatization, are still expected by international organizations such as the IMF and EBRD.

#### **(2) Trade Policy**

As an important part of Uzbekistan's national development, trade policy emphasizes the promotion of foreign investments for export-oriented industries, in particular, the textile industries, with target being a change from fee export of raw and semi-processed goods type to finished products.

Previously, trade consisted mainly of cotton fiber export and oil product and petroleum import with other CIS countries. After independence, the Government made a trade promotion drive, rivaling with countries such as China, Pakistan, India, Iran, Indonesia, Malaysia, Korea, Poland and Turkey. However, one of the important trading issues with western countries, in that the quality and standards of goods from Uzbekistan do not meet western requirements.

#### **(3) Privatization Policy**

Since independence in 1991, the initial program has given priority to the privatization of small firms. It did not provide for the privatization of enterprises with important connections, such as mining, metallurgy, pharmaceutical production and other technology.

In a recent declaration, the government announced its intention to extend privatization to the medium and large enterprises in the more strategic sectors, including more than one thousand enterprises in the ferrous, non-ferrous, rare and precious metal sub-sectors, as well as more than four hundred agricultural businesses.

#### **(4) Private Sector Development Policy**

Development of the private sector has been hampered by a number of constraints, including the unavailability of sufficient credit and finance, the persistence of the state-order systems, lack of local entrepreneurial capabilities, inadequate facilities for small and

medium enterprises, and the lack of office space as well as the absence of a real estate market.

A fund for the Support of Entrepreneurship was established in 1991 through the Union of Entrepreneurs to finance newly established private businesses with government financial support. However, the capitalization fund is too small to provide for the short- and long-term capital needs of new private enterprises.

Some assistance for private sector development has been provided by the Uzbekistan Business Union, a non-governmental organization seeking to promote local entrepreneurship. Although this organization receives some financial support from the European Union, the scope of operation is fairly limited, and it has so far focused mainly on the preparation of business feasibility studies in the area of food processing, agribusiness and tourism.

#### **(5) Policy Deterring the Institutional Framework**

The institutional structure of Uzbekistan's economy remains highly centralized and the activities of industrial enterprises continue to be governed, to a large extent, by the state-order system, which involves the compulsory delivery of goods at fixed prices. The Enterprise Law adopted in 1992 stipulates the priority of production for internal enterprise consumption.

#### **(6) Policy on Foreign Investment**

Since Uzbekistan's manufacturing sector is highly concentrated into a small number of sub-sectors dominated by cotton processing, chemical production, metallurgy and engineering, the government has come to regard the greater diversification of country's industrial base as one of its principal objectives.

A high priority is placed in particular on the development of a consumer goods industry, a sector in which the country's import dependence remains very high. Such diversification is to be achieved both by the conversion of selected military-related industrial enterprises to the production of consumer goods, and through the encouragement of new private initiatives, including foreign direct investment.

Uzbekistan's foreign investment policy formulated by the Ministry of Foreign Economic Relations in cooperation with the Ministry of Finance aims to promote the influx of foreign direct investment for the development of natural resources, modernization of existing industries, establishment of new industries, electronics production, automobile assembly, infrastructure development, with priority given to the telecommunications sector and the development of access route to foreign ports.

### **2.3.2 Development Plan for the Air Transportation Sector**

Although the transportation system in Uzbekistan is relatively well-developed, it faces serious problems with the existing infrastructure due to the lack of maintenance and the prevalence of obsolete vehicles. Large amounts of investment will therefore be needed to upgrade the existing transportation facilities.

Development of transportation facilities is planned and implemented independently by the various corresponding organizations, but a study or plan for the long-term development from the viewpoint of an overall national transport system has not yet been developed.

In the air transport area various studies and plans have been conducted including a Feasibility Study for construction of the New International Airport of Tashkent in 1993, Feasibility Study for the modernization of Tashkent airport in 1995 and a Feasibility Study for Modernization of Three Local Airports in 1996. At present, a modernization project for three local airports (Samarkand, Bukhara and Urgench) is being carried out with Japanese financial assistance, but a long-term development plan related to air transportation at national level is not yet prepared. The following outlines sketches of the future options that are being contemplated at present by NAC.

(1) Introduction of Western Aircraft and Equipment

Since the commissioning of A310-300 in 1993, NAC has contemplated measures to strengthen and up-grade its operational capability through the further introduction of western aircraft such as the B-767-300ER and B-757-200 (VIP outfit) into its international air routes in order to reverse the decline in air traffic volume.

In addition, air traffic control equipment by Thomson-CSF was installed in the operation building newly constructed at Tashkent Airport in 1995.

(2) Air Transportation Center in Central Asia

NAC currently operates more than 75 international flights a week as well as at least 30 round flights a day to 16 destinations in Uzbekistan. NAC also flies to about 30 airports throughout Russia and other Central Asian countries. NAC is anxious to increase its flights to London, Frankfurt, and Beijing. A new route to Jakarta is scheduled to start in the summer of 1997. NAC would also like to start scheduled services to Ho Chi Minh City and destinations in Japan.

NAC feels that Uzbekistan will be an air transportation center in the Central Asian region and the above expansion of international air service routes is contemplated, aiming its at increasing revenue from highly profitable air routes.

Geographically, Uzbekistan is located at the cross point between Europe and Southeast Asia. Currently about 80 passenger flights per day are passing through Uzbekistan airspace. Increasing the passenger flights charge is expected to be a major source of income for NAC.

(3) Airport Development in Tashkent

For Uzbekistan to achieve its ambition of being is an Air Transportation Center in Central Asia, NAC attaches high priority on the modernization of Tashkent Airport and the rehabilitation of runways, the installation of air traffic control equipment and air navigation facilities. Expansion of the passenger terminal building was started, but due to disagreement with EBRD, on finance the work has been suspended.

The existing Tashkent Airport located 5 km from the Tashkent City center is already surrounded by residential settlement. At present, aircraft noise pollution is not a serious problem around the airport.

In view of such factors as aircraft noise pollution due to future increased demand for air traffic, for the constraint on Tashkent City development due to the location of the airport, and the difficulty of expansion of the existing facilities, the relocation of the existing airport to a new possible site was decided by Decree N 114, on April 30, 1991. A master plan and feasibility study were conducted by various consultants, but implementation is not yet in sight.

#### (4) Local Airports Development

There are 20 airports in Uzbekistan, and 17 local airports are served by inter-regional and domestic scheduled flights.

Tourism in Uzbekistan has a major share in air ticket sales, especially on domestic routes between Tashkent and the ancient cities of Samarkand, Bukhara and Urgench, where airport modernization projects are under way with Japanese financial assistance. To further promote domestic tourism, NAC has signed a US\$ 75 million contract to purchase three Aero International (Regional) RJ85 (75 seats) aircraft.

Local airports were constructed mostly in the 1970s and 1980s and some rehabilitation work has been carried out since 1992. Due to budgetary shortages, however, there has been little or no progress. There are some airports intending to modernize their facilities with the financial backing of the province or city authorities.

#### (5) Promotion of the Aviation Industry and Maintenance Sector

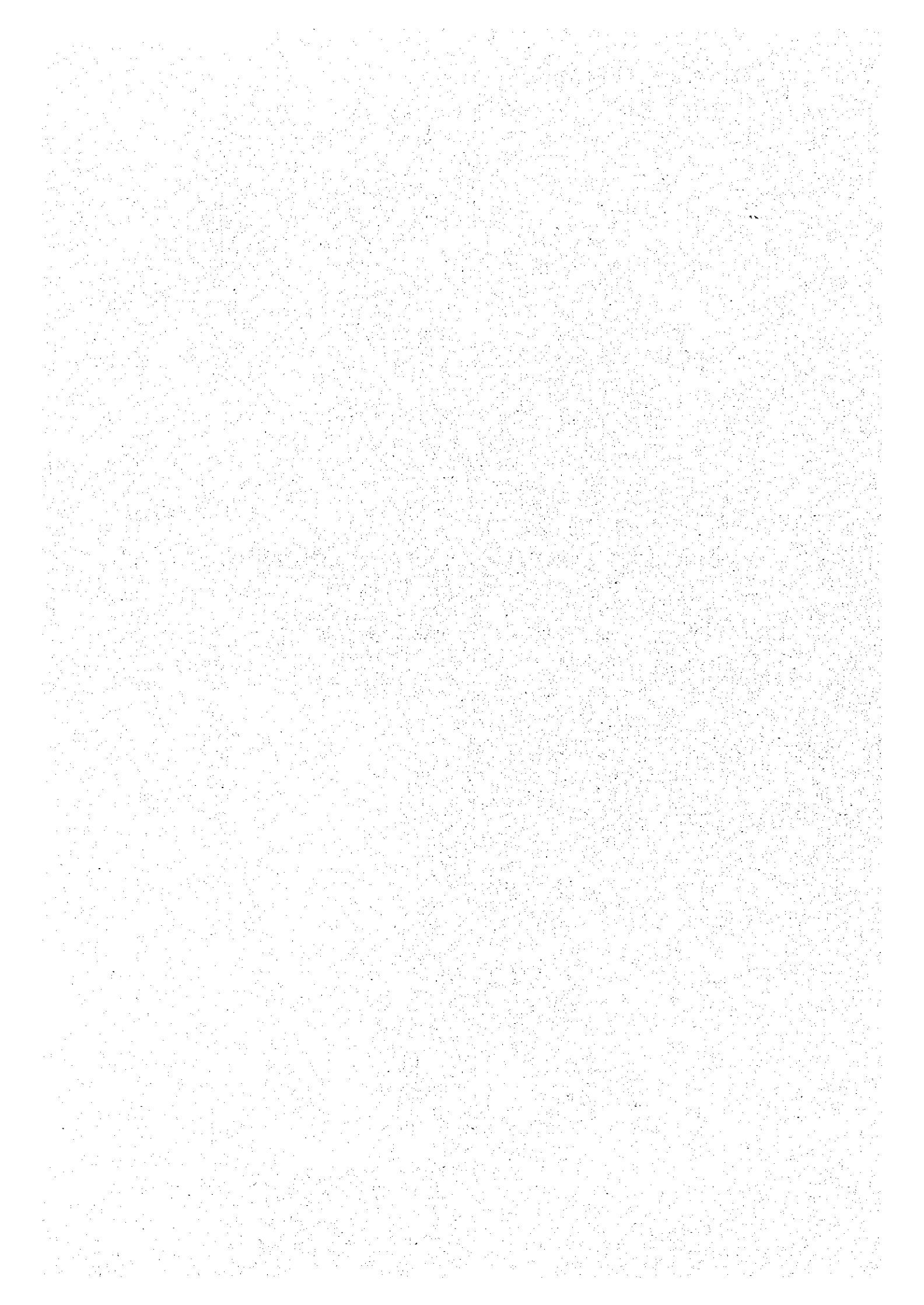
NAC has a four-bay maintenance factory which was one of the largest maintenance centers in the former Soviet Union. It is one of the only IL-62 overhaul facilities in the world and also specializes in IL-76, IL-86 and Tu-154 maintenance.

In parallel with the shift to Western transport, NAC intends to establish a maintenance base within the above maintenance center, specializing in the service of Western-built jets. Lufthansa Technik, which has worked with NAC since 1993 on the A-310, has signed a contract to provide on-site expertise and supervision for maintenance. The first C-check on a Western-built aircraft is scheduled for 1998.

Uzbekistan also has the biggest aircraft factory among the CIS countries, named Tashkent Aircraft Production Corporation at Tapoich. It manufactures the new 65-seater IL-114 twin-turboprop and the IL-76 four-engine military and cargo jet aircraft.



**CHAPTER 3**  
**CURRENT CONDITIONS OF AIR TRANSPORTATION**



## CHAPTER 3 CURRENT CONDITIONS OF AIR TRANSPORTATION

### 3.1 Historical Perspective

Initially, aviation in Uzbekistan started from the activities of the All-Russia Community of Voluntary Air Fleet "Dobrolet" founded in 1923. In August 1923, a branch board of this Community was created for setting up airways in the Turkestan region (Central Asia), and, specially, in Uzbekistan. It was said that at that time, it took more than fifteen days from Tashkent to Alam-Ata on horses and about one month to Khiva through Bukhara.

On May 12, 1924, the first passenger flight started between Tashkent and Alam-Ata after experimental flights by "Dobrolet", this date was then considered to be a memorial day for the birth of civil aviation in Uzbekistan. Then, scheduled flights to Kagan - Termez - Dushanbe and to Kagan - Tashauz - Khiva followed.

In 1932, the territorial management bureau was organized for operation and management of civil aviation activities in Central Asia covering Tashkent, Stalinabad (Dushanbe), Chardju, and Ashgabad. After separation of the Turkmenistan management in the middle of the 1930s, the Uzbeku management bureau operated independently and regional national pilot schools, flight crew and technical specialists for aircraft maintenance were also established.

After World War II, new aircraft such as Li-2, IL-12, IL-14 and An-2 started operation on new routes and since the 1950s impetuous activity in civil aviation started. In 1957, the Tu-104 turbojet was put into new operation and followed by the IL-18 in 1960.

In the 1960s, following the introduction of new types of aircraft such as An-24, Yak-40, IL-62 and Tu-154, Tashkent was connected by new direct air routes with Leningrad, Novosibirsk, Sverdlovsk, Cheliabinsk, Simpheropol and major cities of Baltic Sea, Caucasus and Far East.

From 1970s to 80s, airports with air navigation and communication equipment were constructed in major cities in Uzbekistan, and new terminal complex in Tashkent Airport was completed and put into operation in 1976. In the former USSR era, air transportation activity had been managed and controlled under Aeroflot, and Tashkent Airport as well as Sheremetyevo Airport in Moscow was functioned as one of international gateways in the USSR territory.

After the independence of Uzbekistan, Uzbekistan Airways was founded at the beginning of 1992 as the National Air Company (NAC) inheriting correspondence and component parts from Aeroflot. NAC is one of largest aeronautical companies in the former USSR region and the first company in Central Asia in operating of Western aircraft of A-310 and B-767.

However, similar to as other countries in the CIS region are being encountered, Uzbekistan is also being faced with a big transition and confusion period in respect to both economic and social systems, and institutional structure after independence in 1991

One of the phenomenon seen after independence is the remarkable decline of air traffic demand since 1992 in Uzbekistan as well as other CIS countries. Air passenger traffic volume of Uzbekistan in 1996 decreased to 25% of the figures in 1991, although the decline is becoming a gentle slope recently.

It is considered that the decrease in air traffic demand may be caused by the following reasons;

- fall down of air passenger demand due to economical reform and confusion within Uzbekistan;



- impact from raising air fare and freighter rate due to price up of fuel and other expenses;
- stagnation and inactivity in trades and exchanges of persons and goods between Russia, in particular, Moscow, and CIS countries after breakdown of the former Soviet Union; and
- collapse and breakdown of differentiated production systems among CIS countries under the centralized planned economy previously controlled by Moscow.

Secondly, during the former Soviet Union era, not only air transportation but also other forms of transportation and communication infrastructures were well developed from 1970s to 1980s. However, after the breakdown of the former Soviet Union, these infrastructures were operated and managed without sufficient improvement and maintenance due to insufficient budget.

Thirdly, NAC has actively introduced western-build aircraft and equipment with western financial support, but, discrepancies between Uzbekistan standards/procedure and international standards/procedure are unfolding day by day. This means that new trouble and confusion may be brought into future maintenance procedures.

### 3.2 Air Traffic Statistic

Air traffic statistics data used herein covers only the departure base from each airport. However, to facilitate airport planning and management plan of air transportation system, more detailed statistic data will be needed. Therefore, establishment of systematic and well organized statistic database will be required.

#### 3.2.1 Aircraft Movement

Number of aircraft movement (take-off only) has been decreasing sharply since 1991 and Tashkent airport handled more than 50% of the total aircraft movements in Uzbekistan as shown in Table 3.2.1.

Table 3.2.1 Annual Aircraft Movement ( Number of Take-off ) by Airports

|                                    | 1990    | 1991    | 1992   | 1993   | 1994   | 1995   | 1996 (*1) |
|------------------------------------|---------|---------|--------|--------|--------|--------|-----------|
| TASHKENT (*2)<br>( International)  | 53,362  | 51,429  | 33,833 | 19,197 | 16,192 | 17,405 | 12,195    |
| NAMANGAN (*2)<br>( International)  | 3,609   | 3,800   | 2,578  | 1,411  | 1,108  | 1,308  | 698       |
| ANDIZHAN                           | 4,058   | 4,325   | 2,649  | 1,855  | 1,519  | 1,643  | 1,157     |
| FERGANA (*2)<br>( International)   | 3,726   | 4,503   | 3,125  | 1,607  | 1,383  | 1,503  | 1,278     |
| KOKAND                             | 1,492   | 1,583   | 1,038  | 636    | 1,288  | 3,644  | 789       |
| SAMARKAND (*2)<br>( International) | 9,817   | 9,322   | 4,259  | 2,163  | 1,688  | 1,628  | 1,015     |
| TERMEZ                             | 3,819   | 3,194   | 2,881  | 2,103  | 1,667  | 1,641  | 1,084     |
| KARSHI                             | 4,171   | 4,622   | 2,897  | 1,391  | 1,152  | 1,438  | 1,085     |
| BUKHARA                            | 4,163   | 4,348   | 2,396  | 1,351  | 1,537  | 1,423  | 1,141     |
| NAVOI                              | 5,360   | 3,626   | 1,284  | 755    | 516    | 772    | 440       |
| URGENCH                            | 5,026   | 2,773   | 1,551  | 1,535  | 1,365  | 2,005  | 1,202     |
| NUKUS                              | 23,301  | 13,034  | 5,932  | 3,165  | 2,766  | 2,918  | 1,740     |
| SERGLI                             |         |         |        |        |        |        |           |
| TOTAL (*2)<br>( International)     | 121,904 | 106,559 | 64,423 | 37,169 | 32,181 | 37,328 | 23,824    |
|                                    |         |         |        |        | 2,724  | 2,931  | 2,482     |

Note: (\*1) = data of 9 months (Jan. - Sep.) (\*2) = including international flight, Source : NAC

### 3.2.2 Air Passenger Traffic

The air passenger traffic in Uzbekistan has been decreasing sharply since independence in 1991. The annual total of departure passengers at 13 airports have decreased to 1,350 thousand from 6,330 thousand in 1991 as shown in Table 3.2.2. This decrease in passengers was caused mainly by the domestic and CIS routes passengers, but, international passengers traffic shows slightly upwards demand since 1992.

Tashkent airport handled 65% of total passengers in Uzbekistan, having approx. 880 thousand departure passengers in 1995. There is no other airports which handled more than 100 thousand departure passengers other than Tashkent airport. Urgench airport handled about 70 thousand departure passengers, next to Tashkent airport.

Table 3.2.2 Annual Air Passenger by Airports

|                  | ('000)  |         |         |         |         |         |          |
|------------------|---------|---------|---------|---------|---------|---------|----------|
|                  | 1990    | 1991    | 1992    | 1993    | 1994    | 1995    | 1996 (*) |
| TASHIKENT (*2)   | 3,898.0 | 3,791.5 | 1,957.8 | 953.4   | 940.7   | 879.0   | 658.6    |
| ( International) | 40.6    | 30.5    | 113.2   | 151.9   | 165.1   | 187.4   | 162.9    |
| NAMANGAN (*2)    | 166.8   | 178.0   | 98.1    | 41.3    | 42.0    | 40.4    | 21.7     |
| ( International) |         |         |         |         |         |         | 0.8      |
| ANDIZHIAN        | 166.7   | 193.6   | 116.6   | 66.4    | 54.4    | 58.7    | 32.7     |
| FERGANA          | 164.6   | 167.8   | 104.7   | 52.8    | 48.2    | 52.3    | 37.1     |
| KOKAND           | 63.6    | 54.5    | 29.5    | 10.1    | 7.9     | 13.9    | 5.2      |
| SAMARKAND (*2)   | 534.4   | 491.4   | 177.3   | 67.9    | 61.7    | 45.6    | 28.0     |
| ( International) |         |         |         |         |         |         | 1.3      |
| TERMEZ           | 126.6   | 126.3   | 85.1    | 57.3    | 49.1    | 45.4    | 33.4     |
| KARSHI           | 160.3   | 149.1   | 69.6    | 24.0    | 27.2    | 34.9    | 21.3     |
| BUKHARA          | 199.5   | 195.0   | 78.0    | 34.6    | 42.1    | 44.1    | 32.5     |
| NAVOI            | 135.7   | 95.6    | 34.4    | 15.6    | 10.5    | 13.9    | 8.5      |
| URGENCH          | 263.2   | 232.5   | 108.0   | 48.7    | 59.9    | 68.5    | 61.4     |
| NUKUS            | 404.3   | 329.2   | 132.4   | 47.9    | 46.4    | 52.6    | 44.2     |
| SERGLI           | 45.0    | 48.2    | 18.5    | 12.6    | 7.2     | 2.5     | 1.4      |
| TOTAL (*2)       | 6,328.7 | 6,052.7 | 3,010.0 | 1,432.6 | 1,397.3 | 1,351.8 | 986.0    |
| ( International) | 40.6    | 30.5    | 113.2   | 151.9   | 165.1   | 187.4   | 165.0    |

Note : (\*) = data of 9 months (Jan. - Sep.), (\*2) = including international passenger

Source : NAC

### 3.2.3 Air Cargo Traffic

The air cargo traffic in Uzbekistan also has been decreasing sharply since independence in 1991. The annual outgoing cargo at 13 airports has decreased to 10 thousand tons in 1995 from 39 thousand tons in 1991 as shown in Table 3.2.3. This decrease of cargo was also caused mainly by the domestic and CIS routes cargo demand, but, international cargo traffic does not show a decreasing trend.

Tashkent airport handled about 7 thousand tons of cargo in 1995. Fergana airport handled about 1,900 tons cargo next to the Tashkent airport. Namangan, Kokand, Samarkand airports handled less than 500 tons of cargo only.

Table 3.2.3 Annual Air Cargo by Airports

|                 | (tons)   |          |          |          |          |          |          |
|-----------------|----------|----------|----------|----------|----------|----------|----------|
|                 | 1990     | 1991     | 1992     | 1993     | 1994     | 1995     | 1996 (*) |
| TASHKENT (*2)   | 23,151.4 | 19,902.5 | 16,654.9 | 11,397.4 | 7,587.0  | 7,235.2  | 5,318.6  |
| (International) | 2,404.3  | 332.7    | 5,554.2  | 2,820.6  | 1,373.8  | 2,878.0  | 2,179.8  |
| NAMANGAN        | 6,347.9  | 5,317.2  | 1,356.1  | 895.7    | 340.4    | 433.3    | 97.1     |
| ANDIZHAN        | 1,803.4  | 1,215.6  | 581.1    | 134.7    | 91.2     | 46.2     | 7.3      |
| FERGANA (*2)    | 3,849.0  | 3,077.0  | 1,663.0  | 2,094.2  | 1,852.0  | 1,857.7  | 923.3    |
| (International) |          |          |          |          |          |          | 41.6     |
| KOKAND          | 165.8    | 106.5    | 28.7     | 3.3      | 10.6     | 15.1     | 100.5    |
| SAMARKAND (*2)  | 3,488.8  | 2,157.1  | 1,275.6  | 511.9    | 579.0    | 143.7    | 123.3    |
| (International) |          |          |          |          |          |          | 0.4      |
| TERMEZ          | 347.5    | 562.9    | 206.4    | 123.0    | 158.8    | 23.6     | 12.9     |
| KARSHI          | 129.5    | 256.6    | 83.3     | 44.2     | 35.0     | 33.3     | 6.7      |
| BUKHARA         | 975.9    | 1,191.3  | 397.4    | 73.2     | 283.4    | 112.0    | 19.6     |
| NAVOI           | 46.3     | 61.8     | 18.7     | 14.7     | 3.9      | 2.2      | 0.8      |
| URGENCH         | 1,154.9  | 763.6    | 243.9    | 80.8     | 252.2    | 133.6    | 37.5     |
| NUKUS           | 1,132.9  | 699.4    | 384.9    | 118.2    | 75.0     | 32.8     | 14.4     |
| SERGI           | 2,314.4  | 3,208.2  | 1,206.4  | 1,515.1  | 422.9    | 183.2    | 58.3     |
| TOTAL (*2)      | 44,907.7 | 38,519.7 | 24,100.4 | 17,006.4 | 11,691.4 | 10,251.9 | 6,720.3  |
| (International) | 2,404.3  | 332.7    | 5,554.2  | 2,820.6  | 1,373.8  | 2,878.0  | 2,221.8  |

Note : (\*) = data of 9 months (Jan. - Sep.)

(\*2) = including international cargo, Source : NAC

### 3.2.4 Air Mail Traffic

The air mail traffic in Uzbekistan also has been decreasing sharply since independence in 1991. Tashkent airport handled only 600 tons of mail, and there is few mail handled at the other airports as shown in Table 3.2.4.

Table 3.2.4 Annual Air Mail by Airports

|                 | (tons)   |          |         |         |         |       |          |
|-----------------|----------|----------|---------|---------|---------|-------|----------|
|                 | 1990     | 1991     | 1992    | 1993    | 1994    | 1995  | 1996 (*) |
| TASHKENT (*2)   | 22,024.6 | 13,830.2 | 4,500.4 | 1,474.0 | 1,055.6 | 635.8 | 466.6    |
| (International) |          |          | 4.3     | 2.3     | 2.0     | 12.9  | 8.3      |
| NAMANGAN        | 285.1    | 235.5    | 79.7    | 2.1     |         |       |          |
| ANDIZHAN        | 417.0    | 132.0    | 29.4    |         |         |       |          |
| FERGANA         | 101.1    | 75.3     | 31.5    | 1.2     |         |       |          |
| KOKAND          | 58.2     | 27.2     | 10.7    |         |         | 0.6   |          |
| SAMARKAND       | 372.8    | 306.3    | 140.3   | 5.4     |         |       |          |
| TERMEZ          | 85.1     | 69.4     | 17.6    | 0.8     | 1.3     | 1.7   | 1.3      |
| KARSHI          | 73.2     | 56.4     | 20.7    | 3.1     | 1.1     | 2.3   | 1.3      |
| BUKHARA         | 57.3     | 40.3     | 14.2    | 0.7     |         | 0.8   | 1.7      |
| NAVOI           | 53.4     | 22.0     | 2.1     |         |         |       | 0.8      |
| URGENCH         | 87.4     | 71.6     | 22.9    | 4.8     | 1.6     | 1.6   | 1.1      |
| NUKUS           | 1,414.2  | 407.9    | 10.9    |         | 0.7     | 2.9   | 2.2      |
| TOTAL (*)       | 25,029.4 | 15,274.1 | 4,880.4 | 1,492.1 | 1,060.3 | 645.7 | 475.0    |
| (International) |          |          | 4.3     | 2.3     | 2.0     | 12.9  | 8.3      |

Note : (\*) = data of 9 months (Jan. - Sep.), (\*2) = including international mail, Source : NAC

### 3.3 Air Route Network

#### 3.3.1 Domestic Air Route

Domestic summer schedule in 1997 is shown in Table 3.3.1. All domestic air routes are being served by NAC. Among 19 routes in total, 16 routes are pivoted at Tashkent, three other routes pass by Domodedovo (Moscow).

Table 3.3.1 Domestic Air Route ( Summer in 1997 )

| Domestic Route         | Airline | Aircraft | Freq. (*) | Remarks  |
|------------------------|---------|----------|-----------|--|
| Tashkent ↔ Namangan    | IYY     | Yak-40   | 7         |  |
|                        |         | An-24    | 7         |  |
|                        |         | Tu-154   | 1         |  |
| Tashkent ↔ Andizhan    | IYY     | Yak-40   | 17        |  |
|                        |         | An-24    | 14        |  |
|                        |         | Tu-154   | 1         |  |
| Tashkent ↔ Fergana     | IYY     | An-24    | 20        |  |
|                        |         | Tu-154   | 1         |  |
| Tashkent ↔ Kokand      | IYY     | Yak-40   | 6         |  |
| Tashkent ↔ Samarkand   | IYY     | An-24    | 14        |  |
| Tashkent ↔ Termez      | IYY     | Yak-40   | 19        |  |
|                        |         | An-24    | 6         |  |
|                        |         | Tu-154   | 1         |  |
| Tashkent ↔ Sarassiya   | IYY     | Yak-40   | 7         |  |
| Tashkent ↔ Karshi      | IYY     | Yak-40   | 21        | including "Tashkent → Shakhriyabz → Karshi"      |
| Tashkent → Shakhriyabz | IYY     | Yak-40   | 2         | only one way ( Tashkent → Shakhriyabz → Karshi ) |
| Tashkent ↔ Bukhara     | IYY     | Yak-40   | 14        |  |
|                        |         | An-24    | 7         |  |
|                        |         | Tu-154   | 1         |  |
| Tashkent ↔ Navoi       | IYY     | Yak-40   | 12        |  |
| Tashkent ↔ Uchukuduk   | IYY     | Yak-40   | 3         |  |
| Tashkent ↔ Sadafshan   | IYY     | Yak-40   | 7         |  |
| Tashkent ↔ Urgench     | IYY     | Tu-154   | 7         |  |
|                        |         | Tu-154   | 2         | Tashkent ↔ Urgench ↔ Domodedovo                  |
| Tashkent ↔ Nukus       | IYY     | Tu-154   | 7         |  |
|                        |         | Tu-154   | 1         | Tashkent ↔ Nukus ↔ Minsralunje vodui             |
|                        |         | Yak-40   | 7         |  |
| Tashkent ↔ Turtkul     | IYY     | Yak-40   | 7         |  |
| Namangan ↔ Urgench     | IYY     | Yak-40   | 7         | Namangan ↔ Urgench ↔ Domodedovo                  |
| Andizhan ↔ Karshi      | IYY     | Tu-154   | 1         | Andizhan ↔ Karshi ↔ Domodedovo                   |
| Fergana ↔ Nukus        | IYY     | Tu-154   | 2         | Fergana ↔ Nukus ↔ Domodedovo                     |

Note : (\*) = number of round flight per week

Source : NAC

### 3.3.2 CIS Air Route

CIS route summer schedule in 1997 is shown in Table 3.3.2. Among 32 routes (109 - frequency/week) in total, 25 routes (60 - frequency/week) are being served by NAC. 18 routes are served by both NAC and other CIS airlines. 26 routes (97 - frequency/week) are pivoted at Tashkent. Samarkand, Namangan, Fergana, Bukhara, Andizhan are linked with Domodedovo (Moscow).

Table 3.3.2 CIS Air Route (Summer in 1997)

| CIS Route                  | Airline  | Aircraft                     | Freq. (*) | Remarks                                 |
|----------------------------|----------|------------------------------|-----------|---|
| Tashkent ↔ Almaty          | HY/K4    | Tu-154/Yak-40/Tu-134         | 6         | (HY=5, K4=1)                            |
| Tashkent ↔ Ashghabad       | HY/T5/IR | Yak-40/Yak-42/Tu-154         | 5         | (HY=3, T5=1, IR=1)<br>IR = to Teheran   |
| Tashkent ↔ Bishkek         | HY/K8/K2 | Yak-40/Tu-154                | 3         | (HY=1, K8=1, K2=1)<br>K8 = only one way |
| Tashkent ↔ Chelyabinsk     | HY/KH6   | Tu-154/Tu-134                | 2         | (HY=1, KH6=1)                           |
| Tashkent ↔ Domodedovo      | HY/E3    | A-310/IL-86/Tu-154/<br>An-62 | 32        | (HY=25, E3=7)<br>including via. Urgench |
| Tashkent ↔ Ekaterinburk    | HY/U6    | Tu-154                       | 4         | (HY=2, U6=2)                            |
| Tashkent ↔ Habarovsk       | HY/KH8   | IL-62                        | 2         | (HY=1, KH8=1)                           |
| Tashkent ↔ Irkutsk         | KH3      | Tu-154                       | 2         |   |
| Tashkent ↔ Kaliningrad     | K8       | Tu-154                       | 1         |   |
| Tashkent ↔ Kazan           | HY/PL    | Tu-154                       | 2         | (HY=1, PL=1)<br>PL = to St.Peterburg    |
| Tashkent ↔ Kiev            | HY/U6    | Tu-154                       | 2         | (HY=1, U6=1)                            |
| Tashkent ↔ Krasnodar       | HY/YuK   | Tu-154/Yak-42                | 4         | (HY=2, Yuk=2)                           |
| Tashkent ↔ Krasnoyarsk     | HY/7B    | Tu-154                       | 2         | (HY=1, 7B=1)                            |
| Tashkent ↔ Mineralunie     | HY/MI    | Tu-154                       | 2         | (HY=1, MI=1)<br>HY = via. Nukus         |
| Tashkent ↔ Minsk           | V2       | Tu-154                       | 1         |   |
| Tashkent ↔ Nijuny Novgorod | PN       | Tu-134                       | 1         |   |
| Tashkent ↔ Novosibirsk     | HY/S7    | Tu-154                       | 3         | (HY=2, S7=1)                            |
| Tashkent ↔ Perm            | UP       | Tu-134                       | 3         |   |
| Tashkent ↔ Rostov-ma-donn  | HY/D9    | Tu-154                       | 8         | (HY=1, D9=7)                            |
| Tashkent ↔ Samara          | HY/Yeh5  | Tu-154/Tu-134                | 2         | (HY=1, Yeh5=1)                          |
| Tashkent ↔ Sheremechebo    | UN       | B-737/B-757                  | 5         |   |
| Tashkent ↔ Simferopol      | HY/Mih   | Tu-154                       | 2         | (HY=1, Mih=1)                           |
| Tashkent ↔ St.Peterburg    | HY/PL    | Tu-154                       | 2         | (HY=1, PL=1)<br>PL = via. Kazan         |
| Tashkent ↔ Tbilisi         | RB       | Tu-134                       | 1         |   |
| Tashkent ↔ Tyumen          | HY       | Tu-154                       | 1         |   |
| Tashkent ↔ Ufa             | HY/Zh    | Tu-154/Tu-134                | 3         | (HY=1, Zh=2)                            |
| Tashkent ↔ Volgograd       | HY       | Tu-154                       | 1         |   |
| Samarkand ↔ Domodedovo     | HY       | Tu-154                       | 3         |   |
| Namangan ↔ Domodedovo      | HY       | Tu-154                       | 1         | via. Urgench                            |
| Fergana ↔ Domodedovo       | HY       | Tu-154                       | 1         | via. Nukus                              |
| Bukhara ↔ Domodedovo       | HY       | Tu-154                       | 1         | via. Nukus                              |
| Andizhan ↔ Domodedovo      | HY       | Tu-154                       | 1         | via. Karshi                             |

Source : NAC, Note : (\*) = number of round flight per week

### 3.3.3 International Air Route

International summer schedule for 1997 is shown in Table 3.3.3. Among 22 routes (58 - frequency/week), 18 routes (44 - frequency/week) are being served by NAC, of which 5 routes are being served by both NAC and other international airlines. All international routes originate at Tashkent.

Table 3.3.3 International Air Route ( Summer in 1997)

| International Route     | Airline | Aircraft    | Freq. (*) | Remarks                                      |
|-------------------------|---------|-------------|-----------|--|
| Tashkent ↔ Amsterdam    | HY      | A-310 B-767 | 3         | to New York                                  |
| Tashkent ↔ Athens       | HY      | An-62       | 1         |  |
| Tashkent ↔ Bahrain      | HY      | Tu-154      | 1         | to Male                                      |
| Tashkent ↔ Bangkok      | HY      | B-767/A-310 | 4         |  |
| Tashkent ↔ Beijing      | HY/RD   | B-767/A-310 | 2         | (HY=1, RD=1)                                 |
| Tashkent → Berlin       | HY      | B-767/A-310 | 2/2       | only one way, to Frankfurt                   |
| Tashkent ↔ Bucharest    | RD      | A-310       | 1         |  |
| Tashkent ↔ Delhi        | HY      | A-310 IL-62 | 4         |  |
| Tashkent ↔ Frankfurt    | HY/ LH  | B-767/A-310 | 2         | (HY=6, LH=3)                                 |
| Tashkent ↔ Islamabad    | PK      | Tu-154      | 1         | to Karachi                                   |
| Tashkent ↔ Istanbul     | HY/TK   | B-767/A-310 | 8         | (HY=4, TK=4)                                 |
| Tashkent ↔ Jakarta      | HY      | B-767       | 1         | via Kuala Lumpur                             |
| Tashkent ↔ Karachi      | HY/PK   | Tu-154      | 3         | (HY=2, PK=1)<br>PK = including via Islamabad |
| Tashkent ↔ Kuala Lumpur | HY      | B-767/IL-62 | 3         | including to Jakarta                         |
| Tashkent ↔ London       | HY      | B-767       | 2         |  |
| Tashkent ↔ Male         | HY      | Tu-154      | 1         | via Bahrain                                  |
| Tashkent ↔ New York     | HY      | A-310 B-767 | 3         | via Amsterdam                                |
| Tashkent ↔ Peshawar     | PK      | Tu-154      | 1         |  |
| Tashkent ↔ Seoul        | HY/OZ   | B-767       | 3         | (HY=2, OZ=1)                                 |
| Tashkent ↔ Sharjah      | HY      | Tu-154      | 1         |  |
| Tashkent ↔ Teheran      | IR      | Tu-154      | 1         | via Ashgabad                                 |
| Tashkent ↔ Tel Aviv     | HY      | A-310 B-767 | 4         |  |

Note : (\*) = number of round flight per week

Source : NAC

Bilateral air agreements have been established with 35 countries as of May 1997. Bilateral air agreements presently effective are summarized in Table 3.3.4. NAC has the intention to open new routes to Tokyo and Brussels.

**Table 3.3.4 Bilateral Air Agreement**

| No. | Country           | Date of Agreement |
|-----|-------------------|-------------------|
| 1   | Azerbaijan        | 27 May 1997       |
| 2   | Bahrain           | 11 December 1996  |
| 3   | Belonissia        | 22 December 1994  |
| 4   | Belgium           | 14 November 1996  |
| 5   | Great Britain     | 24 November 1993  |
| 6   | Vietnam           | 14 July 1995      |
| 7   | Germany           | 16 November 1995  |
| 8   | Holland           | 17 October 1995   |
| 9   | Greece            | 25 November 1996  |
| 10  | Georgia           | 28 May 1996       |
| 11  | Egypt             | 12 December 1992  |
| 12  | Israel            | 04 July 1994      |
| 13  | India             | 24 May 1993       |
| 14  | Indonesia         | 04 April 1995     |
| 15  | Jordan            | 23 November 1996  |
| 16  | Kazakhstan        | 25 May 1994       |
| 17  | China             | 19 April 1994     |
| 18  | Kyrgyzstan        | 04 September 1996 |
| 19  | Republic of Korea | 06 June 1994      |
| 20  | Latvia            | 07 June 1995      |
| 21  | Lithuania         | 08 June 1995      |
| 22  | Maldives          | 06 November 1996  |
| 23  | Moldova           | 30 March 1995     |
| 24  | Pakistan          | 16 February 1992  |
| 25  | Poland            | 11 January 1995   |
| 26  | Portugal          | 02 December 1996  |
| 27  | Slovakia          | 17 December 1996  |
| 28  | Russia            | 02 March 1994     |
| 29  | Rimania           | 05 June 1996      |
| 30  | Thailand          | 17 December 1993  |
| 31  | Turkmenistan      | 16 January 1996   |
| 32  | Turkey            | 23 June 1994      |
| 33  | Finland           | 09 February 1996  |
| 34  | Ukraine           | 20 February 1993  |
| 35  | Switzerland       | 17 July 1994      |

Source : NAC

### **3.4 Selection of Study Airports**

There are twenty (20) airports in Uzbekistan including civil aviation and military use. One of the objectives of the Study is to prepare a long-term Master Plan of airports and air navigation facilities to modernize air transportation in Uzbekistan.

Through preliminary review and screening of all airports in Uzbekistan and referring to the Minutes of Discussion between NAC and JICA Preparatory Team dated December 13, 1996, twelve (12) airports are selected.

Of the twelve (12) airports, the Study Team actually conducted a survey of nine (9) airports in April and May 1997 in order to grasp the current situation of each airport's facilities. Regarding the other three airports, the modernization project is underway in which data and information are utilized to the maximum extent.

Tables 3.4.1, 3.4.2 and 3.4.3 show the summary of the preliminary review and screening of the airports and existing condition of the airports respectively.

- a) Muinak Airport in Republic of Karakalpakstan and Djizhak Airports in Djizhak Province which are presently closed for operation are excluded in the Study of Airports.
- b) Sergeli Airport in Tashkent city for general aviation use is excluded in the Study of Airports.
- c) Uchukuduk and Zarafshan Airports in Navoi Province, Sarassiva Airport in Surkhandaria Province, Shakhriyabz Airport in Kashkadarya Province and Turtkul Airport in Republic of Karakalpakstan, of which traffic are extremely limited, are also excluded in the Study of Airports.



Table 3.4.1 Selection of Study Airports

| No. | Airport          | Location<br>(Province) | Passenger<br>(dispatch)<br>(1995)<br>(‘000) | Air-route<br>(1997, Summer) |     |     | Runway<br>(length x<br>Width) | Selection of Airport              |                                   |                  |
|-----|------------------|------------------------|---|-----------------------------|-----|-----|-------------------------------|-----------------------------------|-----------------------------------|------------------|
|     |                  |                        |   | Dom                         | CIS | Int |                               | not<br>serve<br>for air<br>trans. | Little<br>air<br>trans.<br>volume | study<br>airport |
|     |                  |                        |   |                             |     |     |                               |                                   |                                   |                  |
| 1   | TASHKENT         | Tashkent               | 874.3                                       | O                           | O   | O   | 4,000x60, 3,900x45            |                                   |                                   | O                |
| 2   | SERGLI           |                        | -   |                             |     |     | 600x30                        | x                                 |                                   |                  |
| 3   | NAMANGAN         | Namangan               | 40.3  | O                           | O   |     | 3,270x50                      |                                   |                                   | O                |
| 4   | ANDIZHAN         | Andizhan               | 58.7  | O                           | O   |     | 2,900x45                      |                                   |                                   | O                |
| 5   | FERGANA          | Fergana                | 52.3  | O                           | O   |     | 2,860x50                      |                                   |                                   | O                |
| 6   | KOKAND           |                        | 23.7  | O                           |     |     | 1,600x40                      |                                   |                                   | O                |
| 7   | DJIZHAK          | Djizhak                | -   |                             |     |     | 3,000                         | x                                 |                                   |                  |
| 8   | SAMARKAND        | Samarkand              | 45.6  | O                           | O   |     | 3,100x49                      |                                   |                                   | O                |
| 9   | TERMEZ           | Sukhandaria            | 85.9  | O                           | O   |     | 3,000x42                      |                                   |                                   | O                |
| 10  | SARASSIVA        |                        | -   | O                           |     |     | 1,550x35                      |                                   | x                                 |                  |
| 11  | KARSHI           | Kashkadarya            | 33.7  | O                           | O   |     | 2,900x42                      |                                   |                                   | O                |
| 12  | SHAKHRISYA<br>BZ |                        | -   | O                           |     |     | 1,553x35                      |                                   | x                                 |                  |
| 13  | BUKHARA          | Bukhara                | 44.1  | O                           | O   |     | 3,000x45                      |                                   |                                   | O                |
| 14  | NAVOI            | Navoi                  | 13.9  | O                           |     |     | 1,410x45                      |                                   |                                   | O                |
| 15  | UCHKUDUK         |                        | -   | O                           |     |     | 1,488x35                      |                                   | x                                 |                  |
| 16  | ZARAFSAHN        |                        | -   | O                           |     |     | 1,423x40                      |                                   | x                                 |                  |
| 17  | URGENCH          | Khorezm                | 68.5  | O                           | O   |     | 3,000x44                      |                                   |                                   | O                |
| 18  | NUKUS            | Karakal-<br>pakstan    | 50  | O                           | O   |     | 3,000x48                      |                                   |                                   | O                |
| 19  | TURTKUL          |                        | -   | O                           |     |     | 1,500x40                      |                                   | x                                 |                  |
| 20  | MUINAK           |                        | -   |                             |     |     | 2,500                         | x                                 |                                   |                  |

Table 3.4.2 Summary of Airports in Uzbekistan

| No. | Airport     | Province        | Population ('1000) | Main City   | Population ('1000) | Road Distance from Tashkent (km) | Number of Take-off & Landing (1996) | Passenger (Dispatch) ('1000) |      |      |               |      |      | Cargo (Dispatch) (ton) |        |       |               |       |       |
|-----|-------------|-----------------|--------------------|-------------|--------------------|----------------------------------|-------------------------------------|------------------------------|------|------|---------------|------|------|------------------------|--------|-------|---------------|-------|-------|
|     |             |                 |                    |             |                    |                                  |                                     | Total                        |      |      | International |      |      | Total                  |        |       | International |       |       |
|     |             |                 |                    |             |                    |                                  |                                     | 1991                         | 1993 | 1996 | 1991          | 1993 | 1996 | 1991                   | 1993   | 1996  | 1991          | 1993  | 1996  |
| 1   | TASHKENT    | Tashkent        | 4377.7             | Tashkent    | 2107.2             | -                                | 32,457                              | 3,792                        | 950  | 859  | 31            | 152  | 218  | 19,903                 | 11,397 | 5,232 | 332           | 2,821 | 1,159 |
| 2   | SERGLI      |                 |                    |             |                    |                                  |                                     | -                            | -    | -    | -             | -    | -    | -                      | -      | -     | -             | -     | -     |
| 3   | NAMANGAN    | Namangan        | 1786.4             | Namangan    | 362.3              | 302                              | 1,670                               | 178                          | 41   | 27   | -             | -    | 1    | 5,553                  | 898*   | -     | -             | -     | -     |
| 4   | ANDIZHAN    | Andizhan        | 2040.3             | Andizhan    | 312.9              | 362                              | 2,971                               | 194                          | 66*  | -    | -             | -    | -    | 1,216                  | 135*   | -     | -             | -     | -     |
| 5   | FERGANA     | Fergana         | 2499.5             | Fergana     | 181.9              | 331                              | 3,097                               | 168                          | 53*  | -    | -             | -    | -    | 3,077                  | 2,094* | -     | -             | -     | -     |
| 6   | KOKAND      |                 |                    | Kokand      | 189.2              | 247                              | 693                                 | 82                           | 17   | 11   | -             | -    | -    | 138                    | 5      | 1     | -             | -     | -     |
| 7   | DJIZAK      | Djizhak         | 891.1              | Djizak      | 123.9              | 174                              | 2                                   | -                            | -    | -    | -             | -    | -    | -                      | -      | -     | -             | -     | -     |
| 8   | SAMARKAND   | Samarkand       | 2488.6             | Samarkand   | 362.4              | 293                              | 2,008                               | 491                          | 68*  | -    | -             | -    | -    | 2,157                  | 512*   | -     | -             | -     | -     |
| 9   | TERMEZ      | Subchardaria    | 1582.4             | Termez      | 107.2              | 677                              | 2,798                               | 239                          | 108  | 86   | -             | -    | -    | 695                    | 152    | 52    | -             | -     | -     |
| 10  | SARASSIVA   |                 |                    | Sarassiva   | 130.6              | 840                              | 196                                 | -                            | -    | -    | -             | -    | -    | -                      | -      | -     | -             | -     | -     |
| 11  | KARSHI      | Kashkadarya     | 1975.2             | Karshi      | 190.2              | 445                              | 2,167                               | 147                          | 23   | 26   | -             | -    | -    | 235                    | 9      | 5     | -             | -     | -     |
| 12  | SHAKHRISABZ |                 |                    | Shakhrisabz | 156.6              | 360                              | 110                                 | -                            | -    | -    | -             | -    | -    | -                      | -      | -     | -             | -     | -     |
| 13  | BUKHARA     | Bukhara         | 1339.9             | Bukhara     | 238.2              | 561                              | 2,576                               | 195                          | 35*  | -    | -             | -    | -    | 1,191                  | 73*    | -     | -             | -     | -     |
| 14  | NAVOI       |                 |                    | Navoi       | 114.7              | 461                              | 734                                 | 96                           | 16   | 11   | -             | -    | -    | 62                     | 15     | 2     | -             | -     | -     |
| 15  | UCHKUDUK    | Navoi           | 748.2              | Uchkuduk    | 16.5               | 750                              | 394                                 | -                            | -    | -    | -             | -    | -    | -                      | -      | -     | -             | -     | -     |
| 16  | ZARAFSHAN   |                 |                    | Zarafshan   | 51.6               | 660                              | 950                                 | -                            | -    | -    | -             | -    | -    | -                      | -      | -     | -             | -     | -     |
| 17  | URGENCH     | Khorezm         | 1225.9             | Urgench     | 137.8              | 1,022                            | 2,834                               | 233                          | 49*  | -    | -             | -    | -    | 764                    | 81*    | -     | -             | -     | -     |
| 18  | NUKUS       | Karabai-puksian |                    | Nukus       | 191.2              | 1,117                            | 3,072                               | 330                          | 50   | 60   | -             | -    | -    | 1,110                  | 50     | 23    | -             | -     | -     |
| 19  | TURTIKUL    |                 |                    | Turtkul     | 95.7               | 990                              | 677                                 | -                            | -    | -    | -             | -    | -    | -                      | -      | -     | -             | -     | -     |
| 20  | MUINAK      |                 |                    | Muinak      | 27.8               | 1,326                            | -                                   | -                            | -    | -    | -             | -    | -    | -                      | -      | -     | -             | -     | -     |

Table 3.4.3 Summary of Airport Facilities

| No. | Airport       | Distance from the city center (km) | Elevation (m) | Max. Aircraft Weight (ton) | Runway             |            | Taxiway |         | Apron     |    |    | Passenger Terminal |             | Cargo Terminal (sq.m) | Airfield Lighting                 | Radio Navigation Aids     |
|-----|---------------|------------------------------------|---------------|----------------------------|--------------------|------------|---------|---------|-----------|----|----|--------------------|-------------|-----------------------|-----------------------------------|---------------------------|
|     |               |                                    |               |                            | Dimensions (m)     | PCN        | Para    | Extr    | LJ (1996) | MJ | SJ | Inter (sq.m)       | Dom. (sq.m) |                       |                                   |                           |
| 1   | TASHKENT      | 6                                  | 431           | 215                        | 4,000x60, 3,900x45 | 60/R/B/W/T | <1>     | 10, <1> | 1         | 35 | 26 | 39500              | 2920        | 4300                  | ALS3, SFL, PAPIRCL, RWL, TWL, AFL | ILS3, VOR/DME, PAR, NDBx6 |
| 2   | SERGLI        | 12                                 | 396           |                            | 600x30             |            | -       | 3       |           |    |    |                    |             |                       | ALS, RWL, TWL, AFL                | ILS, PAR, NDBx2           |
| 3   | NAMANGAN      | 8                                  | 519           | 190                        | 3,270x50           | 33/F/C/X/T | 1       | 2       | -         | 5  | 2  | -                  | 4219        | 94                    | owned by military                 | ILS                       |
| 4   | ANDIZHAN      | *                                  | 475           | 100                        | 2,900x45           | 14/R/N/W/T | (1)     | 2, (6)  | 11        |    |    |                    |             |                       | owned by military                 | owned by military         |
| 5   | FERGANA       | *                                  | 625           | 170                        | 2,860x50           | 50/F/B/W/T | (1)     | 1, (3)  | 9         |    |    |                    |             | 60                    | none                              | NDBx2, (MM)               |
| 6   | KOKAND        | 11                                 | 500           | 25                         | 1,600x40           | 11/F/A/X/T | <1>     | 2, <1>  | -         | -  | 3  | -                  | 320         |                       |                                   |                           |
| 7   | DIZAK         |                                    |               |                            | 3,000              |            |         |         |           |    |    |                    |             |                       |                                   |                           |
| 8   | SAMARKAND     | 8                                  | 678           | 100                        | 3,100x49           | 29/R/C/X/T | 1       | 4       | -         | 9  | 16 |                    | 5340        | 510                   | ALS, SALS, RWL, TWL, AFL          | ILS, NDBx2                |
| 9   | TERMEZ        | 9                                  | 313           | 190                        | 3,000x42           | 19/R/A/X/U | 1       | 2       | -         | 2  | 5  | -                  | 2200        | none                  | ALS, RWL, TWL, AFL                | ILS, VOR/DME, NDBx2       |
| 10  | SARASSIVA     | 2                                  | 596           | 23                         | 1,550x35           | 21/F/B/Y/T | -       | 1       | -         | -  | 2  |                    |             |                       |                                   |                           |
| 11  | KARSHE        | 12                                 | 374           | 100                        | 2,900x42           | 17/F/B/X/T | 1       | 4       |           | 10 |    |                    | 2400        | 2400                  | ALS, RWL, TWL, AFL                | ILS, NDBx4                |
| 12  | SHAKHRISYA BZ | 6                                  | 600           | 30                         | 1,553x35           | 23/F/A/X/T | -       | 1       | -         | -  | 3  |                    |             |                       |                                   |                           |
| 13  | BUKHARA       | 7                                  | 229           | 110                        | 3,000x45           | 17/R/A/X/T | 2       | 5       | -         | 4  | 5  | -                  | 1100        | 250                   | ALS, SALS, RWL, TWL, AFL          | ILS, VOR/DME, NDBx4       |
| 14  | NAVOI         | 13                                 | 247           | 25                         | 1,410x45           | 7/F/B/Y/T  | -       | 1       | -         | -  | 5  | -                  | NA          | NA                    | none                              | NDBx3                     |
| 15  | UCHKUDUK      | 10                                 | 124           | 22                         | 1,888x35           | 14/F/C/Y/T | -       | 1       | -         | -  | 2  |                    |             |                       |                                   |                           |
| 16  | ZARAFSHAN     | 5                                  | 419           | 25                         | 1,423x40           | 9/F/C/Y/T  | -       | 1       | -         | -  | -  |                    |             |                       |                                   |                           |
| 17  | URGENCH       | 5                                  | 97            | 191                        | 3,000x44           | 38/F/B/W/T | 1       | 2       | -         | 3  | 2  |                    | 3420        | 250                   | ALS, SALS, RWL, TWL, AFL          | ILS, VOR/DME, NDBx4       |
| 18  | NUKUS         | 7                                  | 76            | 165                        | 3,000x48           | 20/R/A/X/T | 1       | 3       | -         | 3  | 5  | -                  | 2200        | 550                   | ALS, SALS, RWL, TWL               | ILS, NDBx4                |
| 19  | TURTKUL       | 2                                  | 101           | 25                         | 1,500x40           | 19/F/B/Y/T | -       | 1       | -         | -  | 5  |                    |             |                       |                                   |                           |
| 20  | MUTNAK        |                                    |               |                            | 2,500              |            |         |         |           |    |    |                    |             |                       |                                   |                           |

### 3.5 Tashkent Airport

#### 3.5.1 General

Tashkent, capital of the Republic of Uzbekistan, is the largest city in Central Asia having more than 2 million population. Tashkent is more than 2000 years old. During its old history it has repeatedly changed its name: Shask, Taj, Chachkent, Binkent.

The capital of Uzbekistan was once Samarkand until the decision was made to transfer the capital from Samarkand into Tashkent in 1936. In 1966, a destructive earthquake shook Tashkent and destroyed a major part of the city. Reconstruction of Tashkent was made with strong support of all the republics of the former Soviet Union.

Tashkent airport is located about 6 km south of the center of Tashkent city and is served as a main gateway to Uzbekistan as well as hub airport of the domestic air network. History of the Tashkent airport started since 1932. The first Tashkent airport opened with an unpaved runway. In 1940s, scheduled flight routes between major cities in USSR were established. In 1958, the airport had a certificate as an international airport and international flight routes between Afghanistan, Thailand, India, Indonesia, Burma (Myanmar) were opened.

The existing 3,900 m-long runway and 4,000m-long runway were constructed in 1979 and 1981 respectively. The international passenger building was completed in 1976 and new domestic passenger terminal building in 1997. New control tower with new ATC equipment was installed in 1996.

#### 3.5.2 Air Traffic Volume (Tashkent)

Current air traffic volume of Tashkent airport is as shown in Table 3.5.1. Flight routes in Uzbekistan are served concentrically from Tashkent Airport. The airport handled 60-70% of passengers and cargo traffic in Uzbekistan. In 1996, the airport handled 22 thousand of international departure passengers, 64 thousand of CIS and domestic departure passengers respectively. Outbound cargo in 1996 was 5 thousand tons in total of international and domestic.

Since 1993, air traffic of both passengers and cargo has been gradually decreasing, but international passenger traffic has been growing at 13% in average for the past three years.

Table 3.5.1 Air Traffic Volume (Tashkent)

| Item   |          | 1990     | 1991     | 1992     | 1993     | 1994    | 1995    | 1996    | 96/95 | 96/91 |
|--|----------|----------|----------|----------|----------|---------|---------|---------|-------|-------|
| Aircraft movements<br>(take off and landing) | Int.     |          |          |          |          |         |         |         |       |       |
|  | CIS/Dom. |          |          |          |          |         |         |         | -     | -     |
|  | Total    | N.A      | N.A      | N.A      | 32,711   | 29,966  | 34,752  | 32,457  | 0.93  | -     |
| Passenger<br>(Dispatch)<br>(000)             | Int.     | 40.6     | 30.5     | 113.2    | 151.9    | 165.1   | 187.4   | 218.1   | 1.16  | 7.15  |
|  | CIS/Dom. | 3,857.4  | 3,761.0  | 1,937.8  | 798.0    | 772.3   | 686.9   | 640.7   | 0.93  | 0.17  |
|  | Total    | 3,898.0  | 3,791.5  | 2,071.0  | 949.9    | 937.4   | 874.3   | 858.8   | 0.98  | 0.23  |
| Cargo<br>(Dispatch)<br>(ton)                 | Int.     | 2,404.3  | 332.4    | 5,554.2  | 2,820.6  | 1,374.0 | 2,878.0 | 1,159.0 |       |       |
|  | CIS/Dom. | 20,747.1 | 19,570.1 | 11,100.7 | 8,576.8  | 6,212.0 | 4,357.0 | 4,073.0 | 0.93  | 0.21  |
|  | Total    | 23,151.4 | 19,902.5 | 16,654.9 | 11,397.4 | 7,586.0 | 7,235.0 | 5,232.0 | 0.72  | 0.26  |

### 3.5.3 Air Field Facilities (Tashkent)

#### (1) Aerodrome Geographical Data

- Geographical coordinates                                N 41° 15' 24''  
E 069° 16' 24'';
- Aerodrome elevation    431 m;
- Aerodrome reference temperature                                290C;
- Magnetic variation    5°E (1995).

#### (2) Runway

The runway system consists of two runways. Pavement structure of the main runway 08L/26R having 4,000 meters-length and 60 meters-width comprises a bituminous overlay on multiple concrete pavement constructed in 1981. The second runway 08R/26L is parallel to the main runway with separation of 210 meters to the main runway. The second runway is 3,900 meters long and 45 meters wide and its pavement structure comprises a bituminous concrete pavement constructed in 1979.

The surface of the two runways were recently overlaid by bituminous concrete and appears to be in good condition, although there are a number of cracks along the longitudinal construction joints of the upper overlaid layer of the pavement. Strengths of the runways are reported as follows:

- the main runway    PCN 60/R/B/W/T
- the second runway    PCN 50/F/C/Y/T

The pavement structures are as follows:

- the main runway
  - 12cm~35cm    bituminous concrete overlay;
  - 21cm~24 cm    reinforced concrete slab;
  - 20cm    cement concrete slab;
  - 20cm    cement concrete slab;
  - 15 cm    sand/gravel (sub base);
- the second runway
  - 14cm~20cm    bituminous concrete overlay
  - 20 cm    bituminous concrete
  - 20 cm    crushed rock (upper sub-base course)
  - 40 cm    sand/gravel (lower sub-base course)

According to AIP information, the mean longitudinal slopes of the runways are as follows:

- the main runway    0.39%
- the second runway    0.37%

### (3) Taxiway

The usage and function of the existing taxiway system is as follows:

- There is no approach procedure published for runway 26 L;
- Runway 08R/26L is used partly as a taxiway, when the runway 08L/26R is in operation;
- The main take-off and landing direction is from Runway 08;
- The taxiway No.6 between taxiway No.4 and taxiway No.5 is closed due to structural failure;
- There is no parallel taxiway on the apron side which is independent of aircraft movements on the apron

The width of the each taxiway is as follows:

- Taxiway No.1~No.6                      22.5 meters;
- Taxiway No.11                            21 meters;
- Taxiway No.12~No.15                  22.5 meters;

The widths of the taxiways generally do not comply with the ICAO standards of 23 meters where code letters of the runway are D and E.

Pavement of the taxiways No.1~No.6 comprises a cement concrete pavement and the same of the taxiways No.11~No.15 comprises a bituminous concrete pavement, constructed in 1979~1981. In general, the pavement surface of the taxiways appears to be in poor condition and the following defects were observed during the site inspection:

#### Taxiway No.1~No.6

- Longitudinal, transverse and diagonal cracking;
- Corner break;
- Joint seal damage;
- Sealing;
- Settlement and fault;
- Shattered slab;
- Spalling;
- Subsidence (taxiway No.6);

#### Taxiway No.11~No.15

- Longitudinal and transverse cracking;
- Alligator-type cracking;
- Block cracking;
- Raveling and weathering
- Rutting;
- Depression.

Strengths of the main part of the taxiways are reported as follows:

|                             |                       |
|-----------------------------|-----------------------|
| Taxiway No.1, No.5 and No.6 | PCN 61/R/B/X/T (215T) |
| Taxiway No.2~No.4           | PCN 70/R/B/X/T (215T) |
| Taxiway No.11~No.15         | PCN 50/F/C/Y/T (215T) |

The pavement structures in the main part of the taxiways are as follows:

**Taxiway No.1~No.5**

|       |                           |
|-------|---------------------------|
| 24 cm | reinforced concrete slab; |
| 22 cm | cement concrete slab;     |
| 20 cm | cement concrete slab;     |
| 15 cm | sand/gravel sub-base.     |

**Taxiway No.6**

|       |                           |
|-------|---------------------------|
| 24 cm | reinforced concrete slab; |
| 22 cm | cement concrete slab;     |
| 15 cm | sand/gravel sub-base      |

**Taxiway No.11~No.15**

|       |                                       |
|-------|---------------------------------------|
| 10 cm | bituminous concrete (surface course)  |
| 20 cm | bituminous concrete (base course);    |
| 20 cm | crushed rock (upper sub-base course); |
| 40 cm | sand/gravel (lower sub-base course).  |

**(4) Apron**

The apron is classified into three parts, namely No.1 apron is for domestic scheduled flights, No.2 apron is for VIP and No.3 apron is for international scheduled flights use. Pavement of the apron No.1 was constructed in 1978-1981 with mainly a bituminous overlay on cement concrete pavement, and partially a cement concrete pavement. There are about seventy aircraft positions for IL-86, IL-76, IL-62, TU-154, TU-134, YAK-40, AN-24 and AN-12 etc.

In general, the surface of the apron No.1 appears to be in poor condition and exhibits the same defects as the bituminous concrete pavement and the cement concrete pavement of the taxiways, with widespread random and block pattern cracking being particularly extensive. Strength of the apron No.1 is reported to be PCN 28/R/B/X/T and the pavement structures are as follows:

- bituminous overlaid portion
  - 10~15 cm bituminous concrete overlay;
  - 20 cm cement concrete slab;
  - 15 cm sand/gravel (sub-base).
- cement concrete portion
  - 40 cm cement concrete slab;

15 cm sand/gravel (sub-base).

The surfacing of the apron No.2 comprises a cement concrete pavement constructed in 1981. There are five aircraft positions of IL-62 and TU-134 class aircraft. In general, the surface of the apron No.2 appears to be in poor condition and exhibits the same defects as the cement concrete pavement of the taxiways. Strength of the apron No.2 is reported to be PCN 42/R/B/X/T and the pavement structure is as follows:

- 36 cm cement concrete slab;
- 40 cm sand/gravel (sub-base);

The surfacing of the apron No.3 comprises a cement concrete pavement constructed in 1981. There are twenty aircraft positions, of which three are for B-747, and seventeen for A-310, B-767, IL-86, IL-62 and TU-154 class aircraft. In general, the surface of the apron No.3 appears to be in poor condition and exhibits the same defects as the cement concrete pavement of the taxiways. Strength of the apron No.3 is reported to be PCN 70/R/B/X/T and the pavement structures are as follows:

- Parking positions for B 747
  - 36 cm cement concrete slab;
  - 30 cm sand/gravel (sub-base);
- Other positions
  - 22 cm cement concrete slab;
  - 20 cm cement concrete slab;
  - 15 cm sand/gravel (sub-base).

#### (5) Drainage

Underground piping system is adopted as a rain water drainage system for the airfield facilities. The culverts are installed parallel to the runways. To the west of the runways both main culverts drain into an open channel system, outside the airport area.

### 3.5.4 Terminal Area Facilities (Tashkent)

#### (1) Passenger Terminal Buildings

Terminal area is located in the center of the airport with a dimension of approx. 2,000 m width and 700 m depth including passenger handling area, cargo handling area, administration area and aircraft maintenance area.

There are two passenger terminal buildings, namely, main terminal building for international and CIS flights, and domestic building for Uzbekistan passengers. Both buildings are used in accordance with the following classification;



**Table 3.5.2 Classification of Usage of Passenger Buildings (Tashkent)**

| Passenger Type  | Destination   | Main Terminal | Domestic Terminal |
|-----------------|---------------|---------------|-------------------|
| Foreigner       | International | X             |                   |
|                 | CIS           | X             |                   |
|                 | Domestic      | X             |                   |
| CIS Nationality | International | X             |                   |
|                 | CIS           | X             |                   |
|                 | Domestic      |               | X                 |
| Uzbekistan      | International | X             |                   |
|                 | CIS           | X             |                   |
|                 | Domestic      |               | X                 |

This classification seems to be made on nationality of passengers, not destination of passengers and it is, generally speaking, very inconvenient for passengers. In future planning of terminal building, the classification should be reconsidered from viewpoint of serviceability to passengers and efficient usage of the building.

Main terminal building of 39,500 m<sup>2</sup> large was constructed in 1976 of reinforced concrete structure and of three (3) stories, having two (2) fingers for international departure and CIS and domestic departure of foreigners. There are no boarding bridges. The new building with departure lounge was under construction between the two fingers, but, currently the work is in suspension due to a delay in financial arrangements.

Domestic passenger building of 2,919 m<sup>2</sup> was completed in 1997 with reinforced concrete structure of one (1) story. Access by vehicle to the building is not permitted, so both departure and arrival passengers have to walk about 200 m. There are no domestic arrival facilities. Arrival passengers are transferred to the exit gate beside the new building by trailer bus without inside illumination.

**(2) Cargo terminal Building**

Cargo handling area is located to the east of passenger handling area. There are international and domestic cargo storage, crane, and offices in the area. Construction of a new cargo building is planned at the south part of the area.

**(3) Control Tower and Operation Building**

Control tower and operation building was newly constructed in 1996 of reinforced concrete structure standing 54 m high at the east side of the domestic passenger terminal building.

**(4) Administration Building**

Administration area is situated to the east side of the cargo handling area. Small administration buildings, mainly one stories, are dotted in the area. Major buildings are aged, but in good conditions.

**(5) VIP Building**

The VIP building, refurbished 1993/94, is located at the west side of the main terminal building. In front of the VIP building, apron is provided for exclusive use. The VIP

building is to be used for government flights and high ranking officials arrival.

**(6) Aircraft Maintenance Area**

Aircraft maintenance area is located to the east part of the administration area, having a area of approx. 350,000 m<sup>2</sup> large. The aircraft engine shop is a 100 m by 45 m building, located at the southeast part corner of the aircraft maintenance area. The hangar, having 240 m length, 70 m depth and 20 m height, belongs to the factory 243, and is located also at the southern perimeter of the aircraft maintenance area.

**(7) Utilities**

Power is supplied by the city with 4 cables of 35 kV. lines. Water is supplied by the city through water mains of 1,200 mm diameter. Hot water is supplied for heating of buildings from the boiler plant in the airport belonging to the city. Gas supply is not available. Sewage is treated by the city through a sewage main of 800 mm diameter. External telephone lines are 400 lines.

**3.5.5 Air Navigation Facilities (Tashkent)**

**(1) Radio Nav aids and Telecommunication**

A new Air Traffic Control (ATC) Center was installed with finance of French commerce bank funds and the Center has been functioning since March 1997.

Nine (9) sets of new ATC radar consoles were installed in the radar control room. Names of consoles are as follows : LANDING, FINAL APPROACH, ACC 1, ACC 2, ACC 3, ACC 4, ACC. STANDBY and SUPERVISORY. Radar simulator equipment was installed for training of air traffic controllers in the same room. Three sets of new ATC consoles were installed at the Control Tower room. Names of consoles are as follows : STARTER , GROUND, SUPERVISORY.

An Air-Route Surveillance Radar (ARSR) with secondary radar was installed for Area Control (ACC) in 1997. Manufacturer is THOMSON-CSF. This secondary radar has only ICAO standard signal mode. Secondary surveillance radar, called "KOREN-AS", which was installed for Area Control (ACC) in 1993 has CIS and ICAO standards signal mode.

An Airport Surveillance Radar (ASR), called "IRTYSH" with secondary radar and moving target identification with 70 km range was installed for Approach Control (APP) in 1989. Precision Approach Radar (PAR), manufactured by TESLA (former CSFR) was installed for both runway directions (08L / 26R). New ILS system, manufactured by ALCATEL was installed for RWY 08L and 26R in 1997. The ILS of RWY 08R was manufactured by Russia and installed in 1991. The ILS RWY 08L is Category II type, whereas others are of Category I. There was no ILS installed on RWY 26L because of the airport boundary.

**Table 3.5.3 Existing Radio Nav aids and Telecommunication Facilities (Tashkent)**

| Equipment  | Manufacturer  | Date of Installation   | Frequency (MHz)   | Remarks   |
|--|---|--|---|---|
| 1. ILS RWY 08L<br>ILZ<br>GP<br>LMM<br>LOM<br>MKR   | ALCATEL   | 1997   | 110.5<br>329.6<br>0.588<br>0.285<br>75  | ID: ING<br>CAT-II   |
| 2. ILS RWY 26R<br>ILZ<br>GP<br>LMM<br>LOM  | ALCATEL   | 1997   | 108.5<br>329.9<br>0.588<br>0.285  | ID: IFD<br>CAT-I  |
| 3. ILS RWY 08R<br>ILZ<br>GP<br>LMM<br>LOM  | RUSSIA  | 1991   | 111.7<br>333.5<br>0.259<br>0.089  | ID: L/W<br>CAT-I  |
| 4. VOR/DME   | ALCATEL   | 1988   | 113.2   | VOR 100W<br>DME 1 kW  |
| 5. RADAR<br>ARSR/SSR<br>ASR/SSR<br>SSR<br>PAR  | THOMSON-CSF<br>RUSSIA<br>RUSSIA<br>TESLA  | 1997<br>1989<br>1993<br>1993                                 | 1200 band<br>800 band<br>1000 band<br>9000 band   | TRAC-RSM 40kW<br>IRTYSH 180 kW<br>KORIN-AS 20kW                           |
| 6. ATC<br>Tower<br>Ground<br>Approach<br>SRE<br>PAR<br>ACC<br>ACC<br>ACC<br>ACC<br>Emergency<br>AHS                            | Russia  | 1979-91  | 120.4<br>121.7<br>125.2<br>119.4<br>120.4<br>129.4<br>133.3<br>133.6<br>134.6<br>121.5<br>126.8 |   |
| 7. AFIN<br>AMSS  | IBM   | 1996   |   |   |
| 8. OTHERS<br>VCCS<br>RDP<br>(FDP)<br>Tape recorder<br>VDF<br>HF<br>Radio Link<br>Inter City Network<br>Engine Generator<br>UPS | THOMSON-CSF<br>THOMSON-CSF<br>THOMSON-CSF<br>RUSSIA<br>RUSSIA<br>RUSSIA<br>SIEMENS<br>SIEMENS | 1997<br>1997<br>1997<br>1997<br>1979<br>1985<br>1997<br>1997 | 2000  | 36 ch<br>AMS, RTTY point-point<br>3phase 3wires 400V<br>200kWx1<br>100kVA |

**(2) Airfield Lighting and Power Supply System**

New airfield lighting system, manufactured by SIEMENS was installed in November 1996 on RWY 08L / 26R / 08R and it complied with ICAO Annex 14 and was supported by computerized equipment, called "Remote Monitoring and Maintenance System". Outline of existing airfield lighting facilities is as follows :

**Table 3.5.4 Airfield Lighting and Power Supply System (Tashkent)**

| Equipment                     | Manufacturer | Date of Installation | Remarks   |
|-------------------------------|--------------|----------------------|---|
| 1. Approach Light             | SIEMENS      | 1996                 | RWY 08L CAT II RWY 08R CAT I<br>RWY 26R CAT I     |
| 2. Runway Centerline Light    | SIEMENS      | 1996                 | North RWY   |
| 3. Runway Edge Light          | SIEMENS      | 1996                 | North, South RWY                                  |
| 4. Touchdown Zone Light       | SIEMENS      | 1996                 | RWY 08L   |
| 5. Threshold Light            | SIEMENS      | 1996                 | North, South RWY                                  |
| 6. Runway End Light           | SIEMENS      | 1996                 | North, South RWY                                  |
| 7. PAPI                       | SIEMENS      | 1996                 | North RWY RWY08R                                  |
| 8. Taxiway Edge Light         | SIEMENS      | 1996                 | North, South RWY                                  |
| 9. Taxiway Centerline Light   | SIEMENS      | 1996                 | North RWY   |
| 10. Sequential Flashing Light | SIEMENS      | 1996                 | RWY 08L   |
| 11. Apron Flood Light         | RUSSIA       | -                    |   |
| 12. Engine Generator          | SIEMENS      | 1996                 | TP 32N 325 kW<br>TP 33N 276 kW                    |
| 13. Transformer               |              |                      | TP 32N 6 kv/0.4 kv<br>400kvAx2<br>TP 33N 250kvAx2 |
| 14. Others                    |              |                      |   |

**(3) Meteorological Facilities**

Meteorological observation system in Tashkent Airport is in conformity with the ICAO standard. Current weather and trend forecast information is given to each air traffic section. Tashkent airport meteorological division is functioning as an area center of aviation meteorology in Uzbekistan. At present, meteorological equipment with software provision of "Alcatel" company is installed at Tashkent and it will start its operation tentatively at the end of 1997. Outline of existing aeronautical meteorological facilities is as follows:

**Table 3.5.5 Aeronautical Meteorological Facilities (Tashkent)**

| Equipment                              | Manufacturer | Date of Installation | Remarks            |
|--|--------------|----------------------|--------------------|
| 1. Wind vane and Anemometer            |              |                      |                    |
| 2. Air and Dew point Temperature Meter |              |                      |                    |
| 3. Barometer                           |              |                      |                    |
| 4. Rain Gauge                          |              |                      |                    |
| 5. Ceilometer                          |              |                      |                    |
| 6. RVR Equipment                       |              |                      | transmission meter |
| 7. Facsimile Recorder                  | Russian      |                      |                    |
| 8. Weather Telegraph                   | Russian      |                      | HF                 |
| 9. Rain Sonde                          | Russian      |                      |                    |
| 10. Weather Information System         | Russian      |                      | VHF(ATIS), HF      |
| 11. VOLMET System                      | Russian      |                      | VHF, HF            |
| 12. Others                             |              |                      |                    |

### 3.6 Namangan Airport

#### 3.6.1 General (Namangan)

Namangan, the capital city of the Namangan Province, is the third largest city, next to Samarkand, in Uzbekistan with a population of more than 330 thousand people and also densely populated area in Uzbekistan.

In Namangan there are several types of industry such as raw cotton and silk fabric, textile, oil production and processing and chemical plants.

The Namangan airport is located at 8 km south-west of the city center and has a 3,270 m-long runway and functions as one of the alternative airports for Tashkent airport.

Land use around the airport is mainly for agriculture field, but a few residence area.

The first airport with a unpaved runway was opened in 1943. In 1950s, the runway was extended to 1,400 m long, but still unpaved. Then, the runway was paved in 1968 to allow An-24, Yak-40 and IL-14 to operate. The latest improvement work was made in 1985 including runway extension to 3,270 m long.

Thereafter, the airport has a capacity to serve operation of large aircraft such as IL-76, one of the largest cargo freighter in the former Soviet Union, which was used to operate 26 flights on the busiest day. To meet these demands, construction of a cargo terminal building for perishable goods having a capacity of 1,100 tons had been started, but, its work was in suspension in unfinished condition.

#### 3.6.2 Air Traffic Volume (Namangan)

Current air traffic volume at Namangan airport is as shown in Table 3.6.1. At present, there are two (2) daily flights with Yak-40 between Tashkent, and one (1) weekly flight with Tu-154 between Moscow, Novosibirsk and Volgograd. Passenger volume in 1996 was 27 thousand with declined tendency since 1991. In previous time, there were more than 5,000 tons cargo annually between CIS countries, but currently only 120 tons cargo is handled.

Table 3.6.1 Air Traffic Volume (Namangan)

| Item  | 1990  | 1991 | 1992    | 1993    | 1994  | 1995  | 1996  | 96/95 | 96/91 |      |
|---|-------|------|---------|---------|-------|-------|-------|-------|-------|------|
| Aircraft movements<br>(Take off and Landing)        | Int.  |      |         |         |       |       | 2     |       |       |      |
|   | CIS   |      | 586     | 265     | 48    | 194   | 248   | 187   | 0.75  | 0.32 |
|   | Dom.  |      | 3,511   | 2,324   | 1,236 | 900   | 1,031 | 741   | 0.72  | 0.21 |
|   | Total | N.A  | 4,097   | 2,589   | 1,284 | 1,094 | 1,279 | 930   | 0.73  | 0.23 |
| Passenger<br>(Dispatch and disembarkation)<br>(000) | Int.  |      |         |         |       |       | 0.8   |       |       |      |
|   | CIS   |      |         |         |       |       | 17.9  | 9.5   | 0.53  |      |
|   | Dom.  |      |         |         |       |       | 22.4  | 16.3  | 0.73  |      |
|   | Total | N.A  | 178.0   | 98.1    | 41.3  | 42.0  | 40.3  | 26.6  | 0.66  | 0.15 |
| Cargo<br>(Dispatch and disembarkation)              | Int.  |      |         |         |       |       |       |       |       |      |
|   | CIS   |      |         |         |       |       |       |       |       |      |
|   | Dom.  |      |         |         |       |       |       |       |       |      |
|   | Total | N.A  | 5,553.0 | 1,436.0 | 898.0 | 340.0 | 433.0 | 116.0 | 0.27  | 0.02 |

### 3.6.3 Airfield Facilities (Namangan)

#### (1) Aerodrome Geographical Data

- Geographical coordinates      N    40° 59' 05''  
   E    071° 33' 27''
- Aerodrome elevation             519 meters
- Aerodrome reference temperature N/A
- Magnetic variation                4° E (1995)

#### (2) Runway

The surfacing of the runway comprises a bituminous concrete pavement constructed in 1985 with dimensions of 3,000 meters long and 45 meters wide, and then extended in 1994 with dimensions 270 meters long and 45 meters wide at the west of the original runway.

In general, the surface of the extended portion of the runway appears to be in good condition. However, the surface of the original runway appears to be in poor condition and the following defects were observed during the site inspection:

- Longitudinal and transverse cracklings;
- Alligator type cracklings;
- Raveling and weathering;
- Patching.

Strength of the runway is reported to be PCN 33/F/C/X/T.

The pavement structure of the original runway is as follows:

- 24 cm             bituminous concrete (surface and base course);
- 15 cm             crushed aggregate (upper sub-base course);
- 40 cm             sand/gravel ( lower sub-base course);
- Subgrade             clay silt

The pavement structure of the extended portion of the runway is as follows:

- 16 cm             bituminous concrete (surface and base course);
- 15 cm             crushed aggregate (upper sub-base course);
- 25 cm             sand/gravel (lower sub-base course);
- Subgrade clay/silt

The mean longitudinal slope of the runway is 1.58% according to AIP information and does not comply with ICAO standards (maximum longitudinal slope: not exceed 1 percent) for airplane reference field length with code number 4.

#### (3) Taxiway

Taxiway system consists of three exit taxiways and one parallel taxiway/apron taxiway. The surfacing of the taxiways comprises a bituminous concrete pavement constructed in 1985. The width of the taxiways is 20 meters each.

In general, the surface of the taxiway appears to be in poor condition, and exhibits the same defects as the original runway.

Strength of the taxiways are reported as follows:

- No.1 exit taxiway PCN 34/F/C/X/T;
- No.2 exit taxiway PCN 37/F/C/X/T;
- No.3 exit taxiway PCN 34/F/C/X/T;
- Parallel taxiway/apron taxiway PCN 37/F/C/X/T.

The pavement structure of the taxiway is as follows:

- 24 cm bituminous concrete (surface and base course);
- 15 cm crushed aggregate (upper sub-base course);
- 40 cm sand/gravel (lower sub-base course);
- Subgrade clay silt

#### (4) Apron

The surfacing of the apron comprises a bituminous concrete pavement constructed in 1985 and expanded in 1994. There are ten (10) aircraft positions, of which five (5) positions are for B-767, B-757, TU-154, IL-86 and IL-76 class aircraft and two (2) positions for YK-40 and AN-24 class aircraft.

In general, the surface of the expanded portion of the apron appears to be in good condition. However, the surface of the original apron appears to be in poor condition and exhibits the same defects as the original runway.

Strength of the existing apron is reported to be PCN 37/F/C/X/T and the pavement structure is as follows:

- 15 cm bituminous concrete (surface and base course);
- 15 cm crushed aggregate (upper sub-base course);
- 40 cm sand/gravel (lower sub-base course);
- Subgrade clay silt

There is another isolated apron and its connection taxiway on the west of the main apron. The surfacing of the apron and the taxiway comprises a bituminous concrete pavement constructed in 1994. The surface of the apron and the taxiway appears to be in good condition, and no major defects were observed during the site inspection.

Strength of the apron and the taxiway is reported to be PCN 34/F/C/X/T and the pavement structure is as follows:

- 15 cm bituminous concrete (surface and base course);
- 15 cm crusher run (upper sub-base course);
- 40 cm sand/gravel (lower sub-base course);
- Subgrade clay silt .

(5) Drainage

Open channel system is adopted as a rain water drainage system for the airfield facilities. There is a concrete box culvert with dimensions of 2 meters high and 2 meters wide across the runway to the outside for irrigation.

**3.6.4 Terminal Area Facilities (Namangan)**

(1) Passenger Terminal Building

The terminal area is located at the east end of the runway and classified into two (2) blocks, namely, passenger terminal building area and administration offices and other buildings area.

The main passenger terminal building was constructed in 1978 having 2 stories and 4,219 m<sup>2</sup> in floor area. Departure building was constructed in 1984 at the south side of the main terminal building, in which there are security check and passport control counter. There is no building for arrival passengers nor facilities.

In the main passenger terminal building, there are coffee shops, shops and NAC's offices.

(2) Cargo Terminal Building

There is no specific cargo building, but handling of air cargo is made currently in the warehouse. In 1986, the airport handled about 6,000 tons of cargo, especially agricultural products, but, the volume of handled cargo in 1996 decreased to 100 tons. Construction of a new cargo building with refrigerating storage was suspended after completion of its structure works due to lack of appropriate fund.

(3) Control Tower and Operation Building

Control tower and operation building with a floor area of 46 m<sup>2</sup> was constructed in 1979 just beside the main terminal building.

(4) Fire Station

Fire station is located at the middle of the runway and its floor area is 450 m<sup>2</sup>

(5) Other Buildings

VIP building is located at the east side of the passenger terminal building.

**3.6.5 Air Navigation Facilities (Namangan)**

(1) Radio Navaids and radio telecommunication

Most of the radio telecommunication equipment was manufactured more than 10 years ago. There is a shortage of spare parts. Aerodrome radar display and landing radar (PAR) display were installed at radar control building that was located in the vicinity of RW-10 threshold. Outline of existing radio navaids and radio telecommunication facilities is as follows :



**Table 3.6.2 Radio Nav aids and Telecommunication Facilities (Namangan)**

| Equipment  | Manufacturer                                    | Date of Installation                 | Frequency (MHz)                    | Remarks                    |
|--|---|--------------------------------------|------------------------------------|----------------------------|
| 1. ILS<br>ILZ<br>GP<br>LMM<br>LOM  | Russia  | 1996                                 | 110.1<br>110.1<br>0.676<br>0.329   | ID:ISA<br>RWY 28           |
| 2. ATC AG<br>Airdrome  | Russia  | 1987                                 | 119.2                              |                            |
| 3. RADAR<br>ASR<br>SSR<br>PAR  | Russia<br>Russia<br>Czech                       | 1996<br>1996<br>1984                 | 800 band<br>1000 band<br>9000 band | 115 kW<br>1.2 kW<br>150 kW |
| 4. AFTN<br>MSS   | Russia  | 1986                                 |                                    |                            |
| 5. OTHERS<br>Tape recorder<br>VDF<br>IFF<br>Radio Link<br>Inter City Network | Hungary<br>Russia<br>Russia<br>Russia<br>Russia | 1989<br>1987<br>1980<br>1984<br>1988 | 400                                | 16 ch<br>AMS, point-point  |

(2) Airfield lighting and power supply system

The airfield lighting system was installed 13 years ago and there is a problem of shortage of spare parts, but operational function is normal condition. Condition of power supply for each individual facility is good. Back-up engine generators were installed to each facility. Outline of existing airfield lighting facilities is as follows :

**Table 3.6.3 Existing Airfield Lighting Facilities (Namangan)**

| Equipment             | Manufacturer | Date of Installation | Remarks                          |
|-----------------------|--------------|----------------------|----------------------------------|
| 1. Approach Light     | Czech        | 1984                 | RWY 28                           |
| 2. Runway Edge Light  | Czech        | 1984                 |                                  |
| 3. Threshold Light    | Czech        | 1984                 |                                  |
| 4. Taxiway Edge Light | Czech        | 1984                 |                                  |
| 5. Turning Pad Light  | Czech        | 1984                 |                                  |
| 6. Apron Flood Light  | USSR         | 1984                 |                                  |
| 7. Engine Generator   | USSR         | 1980                 | 3 phase 3 wires 400 V<br>50 kWx1 |
| 8. Others             |              | 1983                 |                                  |

**3.7 Andizhan Airport**

**3.7.1 General (Andizhan)**

Andizhan is the capital of the Andizhan Province with a population of more than 300 thousand

and its population density is the highest in Uzbekistan having 437.8 men/Km<sup>2</sup>, which is higher than that in Moscow. The Province has less than 1 percent of Uzbekistan's territory, but it accounts for 9 percent of total population.

Andizhan is one of the oldest towns in the Fergana Valley and has developed industries such as motorcar manufacturing by joint enterprise, machines manufacturing, oil production, affiliate of Tashkent Aircraft Production Company, cotton processing and light textile.

Andizhan airport is located about 7 kilometers south-west of the center of Andizhan. The airport was constructed in 1980, and is administrated and operated by the military, except the public facilities, such as the terminal building, the east apron and its connection taxiway No. 8. There are few residents area around the airport. Airport layout plan was not provided to the Study Team.

### 3.7.2 Air Traffic Volume (Andizhan)

Current air traffic of Andizhan airport is as shown in Table 3.7.1. At present, there are scheduled flights between Domodedovo (Moscow) and Tashkent. Recent departure passengers have been changed from 55 thousand to 60 thousand with a slight increasing trend.

Table 3.7.1 Air Traffic Volume (Andizhan)

| Item   |       | 1990    | 1991    | 1992  | 1993  | 1994  | 1995  | 1996  |
|--|-------|---------|---------|-------|-------|-------|-------|-------|
| Aircraft movements<br>(Take off and Landing) | Int.  |         |         |       |       |       |       |       |
|  | CIS   |         |         |       |       |       |       |       |
|  | Dom.  |         |         |       |       |       |       |       |
|  | N.S   |         |         |       |       |       |       |       |
| Total  |       | N.A     | N.A     | N.A   | 3,572 | 2,988 | 3,194 | 2,971 |
| Passenger<br>(Dispatch)<br>(000)             | Int.  |         |         |       |       |       |       |       |
|  | CIS   |         |         |       |       |       |       |       |
|  | Dom.  |         |         |       |       |       |       |       |
|  | Total | 166.7   | 193.6   | 116.6 | 66.4  | 54.4  | 58.7  | *     |
| Cargo<br>(Dispatch)<br>(ton)                 | Int.  |         |         |       |       |       |       |       |
|  | CIS   |         |         |       |       |       |       |       |
|  | Dom.  |         |         |       |       |       |       |       |
|  | Total | 1,803.4 | 1,215.6 | 581.1 | 134.7 | 91.2  | 46.2  | *     |

### 3.7.3 Air Field Facilities (Andizhan)

#### (1) Aerodrome Geographical Data

- Geographical coordinates      N 40° 43' 57''  
E 072° 17' 57''
- Aerodrome elevation            475 meters
- Aerodrome reference temperature 38°C
- Magnetic variation              4° E (1994)

(2) Runway

The surfacing of the runway comprises a cement concrete pavement constructed in 1980 with dimensions of 2,900 meters long and 45 meters wide. Strength of the runway is reported to be PCN 14/R/A/W/T (100 T). The mean longitudinal slope of the runway is 0.17 % according to AIP information.

Andizhan airport has a plan to construct a new parallel runway being 3,500 m long and 50 m width for civil aviation use with 150 m separation to the existing runway.

(3) Taxiway

The taxiway system consists of seven exit taxiways and one parallel taxiway for joint-use by the military and NAC, and one connection taxiway No.8 to the east apron.

The surfacing of the taxiways comprises a bituminous concrete pavement except exit taxiways No.1 and No.5, which comprises a cement concrete pavement, constructed in 1980. Among the taxiways, the connection taxiway No.8 was re-paved in 1996.

In general, the surface of the connection taxiway No.8, which was the only taxiway inspected by the Study Team, appears to be in good condition and no major defects were observed during the site inspection.

The width of the taxiways are reported as follows:

- No.1 exit taxiway 26m;
- No.2 exit taxiway 18m;
- No.3 exit taxiway 15m;
- No.4 exit taxiway 26m;
- No.5 exit taxiway 26m;
- No.6 exit taxiway 10m;
- No.7 exit taxiway 20m;
- No.8 connection taxiway 23m;
- Parallel taxiway N/A

Strengths of the taxiways are reported as follows:

- No.1 exit taxiway PCN 14/R/A/W/T (100 T);
- No.2 exit taxiway N/A;
- No.3 exit taxiway PCN 62/F/C/X/T (100 T);
- No.4 exit taxiway PCN 62/F/C/X/T (100 T);
- No.5 exit taxiway PCN 14/R/A/W/T (100 T);
- No.6 exit taxiway NA;
- No.7 exit taxiway PCN 20/F/C/Y/T (100 T);
- No.8 connection taxiway PCN 38/F/C/X/T (100 T);
- Parallel taxiway N/A.

The pavement structure of the connection taxiway No.8 is as follows:

- 25 cm bituminous concrete (surface and base course);
- 24 cm crushed aggregate (upper sub-base course);
- 55 cm gravel (lower sub-base course);
- Subgrade clay-sand/silt

#### (4) Apron

The surfacing of the east apron comprises a bituminous concrete pavement constructed originally in 1980 and re-paved in 1996. There are nine aircraft positions, of which one is for IL-76, five for TU-154 and three for YK-40 and AN-24.

In general, the surface of the east apron appears to be in good condition and no major defects were observed during the site inspection.

Strength of the east apron is reported to be PCN 24/F/C/Y/T and the pavement structure is as follows:

- 25 cm bituminous concrete (surface and base course);
- 24 cm crushed aggregate (upper sub-base course);
- 55 cm gravel (lower sub-base course).
- Subgrade clay/sand silt

#### (5) Drainage

Pumping-up and underground piping system is adopted as an underground and a rain water drainage system for the airfield facilities. It seems that the existing drainage system is sufficient functionally because of the low precipitation of this area.

### 3.7.4 Terminal Area Facilities (Andizhan)

#### (1) Passenger Terminal Building

The existing terminal building having 2 stories was constructed in 1979 by Andizhan city and its capacity is 300 passengers/hour.

At present, there are 5 daily flights between Tashkent with Yak-40 and 1 flight per week via Karshi Airport using a Tu-154. Before independence, Andizhan Airport had handled more than 200 thousand passengers, but currently reduced to about 50 thousand passengers.

The existing passenger terminal building is located in the center of the civil aviation area and there is enough space for future expansion around the building, which is used for flower gardens.

Regarding departure passenger flow, a newly constructed waiting hall in 1996 is on second floor and departure passengers go down to ground floor for boarding by walk from this hall. Generally, most of local airport the passengers are handled on one floor level.

The ground floor under the departure waiting hall is used as the arrival area having a belt conveyor, passport control and custom facilities.

#### (2) Cargo Terminal Building

Previously the airport had handled about 1,800 tons of air cargo, but recently handled 7 tons

of cargo from January to September 1996. A cargo terminal building located at the existing VIP building was already removed. Occasionally, temporary tent type warehouses are installed as needed.

(3) Control Tower and Operation Building

The existing control tower managed by both military and NAC is located in the military area. There is a plan to construct a new tower adjacent to the middle of the runway.

(4) Administration Building

There is no administration building, but office space for NAC is prepared in the passenger terminal building.

(5) Fire Station

Fire station is managed by the military.

(6) Other Buildings

There is a VIP building constructed by Andizhan city which is located to the left side and a garage for a vehicle on the right side of the passenger terminal building respectively.

### 3.7.5 Air Navigation Facilities (Andizhan)

(1) Radio Nav aids and Telecommunications

Aeronautical nav aids (LMM, LOM) and part of air traffic control facilities were installed by the military section. According to the airport staff, they are planning to install new nav aids and ATC facilities by the province budget.

Table 3.7.2 Radio Nav aids and Telecommunications under control by NAC(Andizhan)

| Equipment   | Manufacturer                | Date of Installation | Frequency (MHz)       | Remarks          |
|---|-----------------------------|----------------------|-----------------------|------------------|
| 1. ILS<br>ILZ<br>GP                                     | Russia                      | 1988                 | 110.5<br>329.6        | RWY 04           |
| 2. ATC<br>AG<br>Airdrome                                | Russia                      | 1987                 | 128.0                 |                  |
| 3. RADAR<br>ASR<br>SSR                                  | Russia                      | 1988                 | 800 band<br>1000 band | 115 kW<br>1.2 kW |
| 4. AFIN<br>MSS  | Russia                      | 1991                 |                       |                  |
| 5. OTHERS<br>Tape recorder<br>VDF<br>Inter City Network | Hungary<br>Russia<br>Russia | 1986<br>1990<br>1988 |                       | 16 ch            |

(2) Airfield Lighting

Airfield lighting facilities, such as approach light system, runway light and taxiway light were installed by the military section. Apron flood light were installed by NAC. According to the airport staff, they are planning to install new airfield lighting facilities by the province budget.

### (3) Meteorological Facilities

Meteorological observation system is provided in accordance with the ICAO standard. Current weather and trend forecast information is given to each air traffic control section. According to the airport staff, they are planning to install new meteorological facilities by province budget.

**Table 3.7.3 Existing Aeronautical Meteorological Facilities (Andizhan)**

| Equipment                              | Manufacturer | Date of Installation | Remarks |
|--|--------------|----------------------|---------|
| 1. Windvane and Anemometer             | Russian      | 1982                 |         |
| 2. Air and Dew point Temperature Meter | Russian      | 1982                 |         |
| 3. Barometer                           | Russian      | 1982                 |         |

## 3.8 Fergana Airport

### 3.8.1 General (Fergana)

Fergana was founded in 1976 as the regional center of Fergana Valley under the former Soviet Union. Presently Fergana has grown into the third-largest city in Uzbekistan with a population of 182 thousand. In Fergana, there are several industries such as oil processing including aviation fuel, fertilizer manufacturing, chemistry production, machine assembly as well as textile and silk fabric.

Fergana airport is located about 3 km west of the center of Fergana. In 1938, the first Fergana airport was opened as a cargo transportation airport. In 1965, the runway was extended to 2,000m long, then, in 1988 and 1992, improvement work to accommodate IL76 was made including extension of the runway to 2,860 m long.

The airport is a joint-use aerodrome administrated and operated by the military, except the public facilities such as the north apron and its connection taxiway No. 6, and was constructed in 1978.

### 3.8.2 Air Traffic Volume (Fergana)

Current air traffic volume at Fergana airport is as shown Table 3.8.1. At present, there are three (3) or four (4) scheduled flights per day between Tashkent with An-24 or Tu-154, and one (1) weekly scheduled flight to Moscow by Tu-153. Occasionally, there are chartered flights between India, Pakistan, Syria UAE and freighters with other CIS countries. Air passengers traffic for the past three years was constantly approx. 50 thousand. The airport, next to the Tashkent Airport, handled the second largest volume of cargo. Although cargo volume handled at Tashkent and other airports was recently reduced to 20-30% of the same in 1991, but decrease of cargo volume in Fergana Airport was 50% only of the same in 1991. This record means there is a high latent demand in Fergana airport.

**Table 3.8.1 Air Traffic Volume (Fergana)**

| Item   |       | 1990    | 1991    | 1992    | 1993    | 1994    | 1995    | 1996  | 96/95 | 96/91 |
|--|-------|---------|---------|---------|---------|---------|---------|-------|-------|-------|
| Aircraft movements<br>(Take off and Landing) | Int.  |         |         |         |         |         |         |       |       |       |
|  | CIS   |         |         |         |         |         |         |       |       |       |
|  | Dom.  |         |         |         |         |         |         |       |       |       |
|  | N.S   |         |         |         |         |         |         |       |       |       |
|  | Total | N.A     | N.A     | N.A     | 2,690   | 2,567   | 2,758   | 3,097 | 1.12  | -     |
| Passenger<br>(Dispatch)<br>(000)             | Int.  |         |         |         |         |         |         |       |       |       |
|  | CIS   |         |         |         |         |         |         |       |       |       |
|  | Dom.  |         |         |         |         |         |         |       |       |       |
|  | Total | 164.6   | 167.8   | 104.7   | 52.8    | 48.2    | 52.3    | *     | 0.00  | 0.00  |
| Cargo<br>(Dispatch)<br>(ton)                 | Int.  |         |         |         |         |         |         |       |       |       |
|  | CIS   |         |         |         |         |         |         |       |       |       |
|  | Dom.  |         |         |         |         |         |         |       |       |       |
|  | Total | 3,849.0 | 3,077.0 | 1,663.0 | 2,094.2 | 1,852.0 | 1,857.7 | *     | 0.00  | 0.00  |

### 3.8.3 Airfield Facilities (Fergana)

#### (1) Aerodrome Geographical Data

- Geographical coordinates           N 40° 21' 30''  
  E 071° 44' 42''
- Aerodrome elevation                 625 meters
- Aerodrome reference temperature   35°C
- magnetic variation                   4°E (1995)

#### (2) Runway

The runway with dimensions of 2,860 meters long and 50 meters wide has the compass orientation 180°-360° against the prevailing wind direction of 90°-270°. The surfacing of the runway comprises a bituminous concrete pavement constructed originally in 1978 and re-paved in 1991. Strength of the runway is reported to be PCN 50/F/B/W/T (170T) and the pavement structure is as follows:

- 28 -38 cm                               bituminous concrete (surface and base course)
- 40 cm                                     gravel (sub-base course)
- Subgrade                                sand/granular

The mean longitudinal slope of the runway is 1.4% according to AIP information and does not comply with ICAO standards for aeroplane reference field length with code number 4.

#### (3) Taxiway

Taxiway system consists of four exit taxiways and one parallel taxiway for joint-use by the military and NAC, and one connection taxiway No.6 to the north apron for civil aviation use.

The surfacing of the taxiways comprises a bituminous concrete pavement constructed in 1978. Among the taxiways, the connecting taxiway No.6 was re-paved in 1991.

In general, the surface of the connecting taxiway No.6, which was the only one to be inspected by the JICA Study Team, appears to be in good condition and no major defects were observed during the site inspection.

The widths of each taxiway are reported as follows:

- No.1 exit taxiway 18 meters
- No.2 exit taxiway 18 meters
- No.3 exit taxiway 18 meters
- No.4 exit taxiway 18 meters
- No.5 taxiway (abolished)
- No.6 connection taxiway 24 meters
- Parallel taxiway 18 meters.

Strengths of each taxiway are reported as follows:

- No.1 exit taxiway PCN 29/F/B/W/T
- No.2 exit taxiway PCN 28/F/B/X/T
- No.3 exit taxiway PCN 28/F/B/X/T
- No.4 exit taxiway PCN 28/F/B/X/T
- No.5 taxiway (abolished)
- No.6 connecting taxiway PCN 28/F/B/W/T
- Parallel taxiway PCN 22/F/B/X/T~29/F/B/W/T

The pavement structure of the connecting taxiway No.6 is as follows:

- 26 cm bituminous concrete (surface and base course)
- 24 cm gravel (sub-base course)
- Subgrade sand/gravel

#### (4) Apron

The surfacing of the north apron comprises a bituminous concrete pavement constructed in 1978 and re-paved in 1991. There are nine (9) aircraft positions for IL-76, TU-154, TU-134, YK-40, AN-24 and other light aircraft. In general, the surface of the north apron appears to be in good condition and no major defects were observed during the site inspection. Strength of the north apron is reported to be PCN 24/F/B/X/T and the pavement structure is as follows:

- 19 cm bituminous concrete (surface and base course)
- 20 cm gravel (sub-base concrete)
- Subgrade sand/granular

#### (5) Drainage

No drainage system is installed for the airfield facilities, because of the nature of the soil and the low precipitation of this area.



### **3.8.4 Terminal Area Facilities (Fergana)**

#### **(1) Passenger Terminal Buildings**

The existing passenger terminal building was constructed of reinforcement concrete in 1988 in the civil aviation area, which is at the northern part of the airport boundary. The building has 2 stories with a capacity of 200 passengers/peak hour. Passengers are handled on the first floor only. Facilities and space for arrival passengers are not provided in the terminal building. Arrival passengers walk through a passage without a ceiling after disembarking to the curbside. International arrival space is under rehabilitation.

Floor layout of the building is extremely common as seen in other airports in Uzbekistan, in which there are wider and bleak public hall, closed type check-in booth, shops and snack.

#### **(2) Cargo Building**

Cargo terminal building was constructed of reinforcement concrete at the west side in the civil aviation area, of which half is used by Uzaeronavigation office.

Major air cargo goods are fruits and perishable vegetable for Tashkent and Moscow.

#### **(3) Control Tower and Operation Building**

Air traffic control is made mainly by military in the joint-use control tower.

#### **(4) Administration Building**

There is no particular administration building, but office space for NAC is provided on the second floor of the passenger terminal building.

#### **(5) Fire Station**

NAC has no fire and rescue station in the airport and activities of fire fighting and rescue is managed by the military.

#### **(6) Other Buildings**

The existing VIP building was converted in 1988 from the former passenger building constructed in 1963 upon completion of the existing passenger terminal building.

Garage and storage buildings are located to the west side of the VIP Building.

### **3.8.5 Air Navigation Facilities (Fergana)**

#### **(1) Radio Nav aids and Radio Telecommunication**

Radio Nav aids and radio telecommunication were mainly installed and managed by the military. According to the airport staff, the existing ILS is planned to be replaced by the ILS in Bukhara, which will be renewed by the Three Airport Modernization Project.

Radio telecommunication under control of Uzaeronavigation of NAC are shown below.

**Table 3.8.2 UZAERO's Radio Telecommunication Facilities**

| Equipment                  | Manufacturer | Date of Installation | Frequency (MHz) | Remarks     |
|----------------------------|--------------|----------------------|-----------------|-------------|
| 1. ATC<br>AG<br>Airdrome   | Russia       | 1988                 | 129.5           |             |
| 2. AFIN<br>MSS             | Russia       | 1986                 |                 |             |
| 3. OTHERS<br>Tape recorder | Hungary      | 1986                 |                 | 16 ch.      |
| VDF                        | Russia       | 1988                 |                 |             |
| HF                         | Russia       | 1986                 | 4.83, 4.145     | point-point |
| Inter City Network         | Russia       | 1988                 |                 |             |

**(2) Airfield Lighting and Power Supply System**

Airfield lighting facilities such as approach light system, runway light and taxiway lights were installed by the military section in 1987. Apron flood light were installed by NAK in 1987.

According to the airport staff, the airfield lighting system of Samarkand airport is to be moved to the Fergana airport later this year.

Two sets of emergency engine generator with the specification of 3 phase, 3 wires, 400V 75 kW for the air field lighting system and radio telecommunication facility were installed by NAK in 1987.

**(3) Meteorological Facilities**

Meteorological observation system is provided in accordance with the ICAO standard as shown below. Current weather and trend forecast information is given to each air traffic control section of military and NAC, and also Fergana airport meteorological division plays a role as a weather observation center for Fergana Province.

**Table 3.8.3 Existing Aeronautical Meteorological Facilities(Fergana)**

| Equipment                                 | Manufacturer | Date of Installation | Remarks    |
|---|--------------|----------------------|------------|
| 1. Wind vane and Anemometer               | Russian      | 1988                 |            |
| 2. Air and Dew point<br>Temperature Meter | Russian      | 1982                 |            |
| 3. Barometer                              | Russian      | 1982                 |            |
| 4. Rain Gauge                             | Russian      | 1982                 |            |
| 5. Ceilometer                             | Russian      | 1984                 |            |
| 6. RVR Equipment                          | Russian      | 1982                 | Panel type |
| 7. Facsimile Recorder                     | Russian      | 1982                 |            |
| 8. Weather Telegraph                      | Russian      | 1982                 | HF and I/L |
| 9. Others                                 |              |                      |            |

**3.9 Kokand Airport**

**3.9.1 General (Kokand)**

Kokand is one of the major cities in Fergana Province with a population of 189 thousand. In the history of Kokand city, at the beginning of the 18<sup>th</sup> century, Kokand was erected as a citadel on the

Silk Road by one of the Uzbek tribe, named Shakhrukhbiy.

In 1920s, Kokand became a major city in the Fergana Valley. Presently in Kokand there are several enterprises of light and heavy processing industries including a gas apparatus production plant and machine building plants.

The Kokand airport is located about 4 km south of the center of Kokand city. The first Kokand airport was operated at another place. The present Kokand airport was opened in 1977 with a runway of 1,600 m long and passenger terminal building. In the past, there was a plan for a runway extension to 3,000 m long and land use around the airport was controlled, but work was not executed to date.

### 3.9.2 Air Traffic Volume (Kokand)

Current air traffic volume at Kokand airport is as shown Table 3.9.1. At present, there is only one (1) daily flight between Tashkent with An-24 or Yak-40. Air passenger traffic in 1996 was 11 thousand. Passenger and cargo traffic has been decreasing to 14% and 1% of the same in 1991.

Table 3.9.1 Air Traffic Volume (Kokand)

| Item   |       | 1990  | 1991  | 1992  | 1993  | 1994  | 1995  | 1996  | 96/95 | 96/91 |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aircraft movements<br>(Take off and Landing) | Int.  | -     | -     | -     | -     | -     | -     | -     | -     | -     |
|  | CIS   | 56    | 48    | 2     | 2     | 2     | -     | -     | -     | -     |
|  | Dom.  | 2,888 | 2,864 | 1,622 | 788   | 620   | 1,160 | 692   | 0.60  | 0.24  |
|  | N.S   | 40    | 254   | 558   | 482   | 1,954 | 6,128 | 1,148 | 0.19  | 4.52  |
|  | Total | 2,984 | 3,166 | 2,182 | 1,272 | 2,576 | 7,288 | 1,840 | 0.25  | 0.58  |
| Passenger<br>(Dispatch)<br>(000)             | Int.  | -     | -     | -     | -     | -     | -     | -     | -     | -     |
|  | CIS   | 0.1   | 0.0   | -     | 0.0   | 0.0   | -     | -     | -     | -     |
|  | Dom.  | 49.7  | 81.9  | 56.3  | 17.1  | 12.5  | 23.7  | 11.2  | 0.47  | 0.14  |
|  | Total | 49.7  | 81.9  | 56.3  | 17.1  | 12.5  | 23.7  | 11.2  | 0.47  | 0.14  |
| Cargo<br>(Dispatch)                          | Int.  | -     | -     | -     | -     | -     | -     | -     | -     | -     |
|  | CIS   | 87.6  | 62.7  | -     | -     | 4.0   | -     | -     | -     | -     |
|  | Dom.  | 145.7 | 75.2  | 43.9  | 4.7   | 7.9   | 7.3   | 1.0   | 0.14  | 0.01  |
|  | Total | 233.3 | 137.9 | 43.9  | 4.7   | 11.9  | 7.3   | 1.0   | 0.14  | 0.01  |

### 3.9.3 Airfield Facilities (Kokand)

#### (1) Aerodrome Geographical Data

- Geographical coordinates N 40° 26'  
E 070° 59'
- Aerodrome elevation 500 meters
- Aerodrome reference temperature 34° C
- Magnetic variation 4° E

## (2) Runway

The surfacing of the runway comprises a bituminous concrete pavement constructed in 1977 with the dimensions of 1,600 meters long and 40 meters wide. In general, the surface of the runway appears to be in poor condition, and the following defects were observed during the site inspection:

- Longitudinal and transverse cracks;
- Alligator type cracks;
- Raveling and weathering;
- Patching.

The runway was planned to be extended by 1300 meters on the west of the existing runway to facilitate TU-154 and IL-76 aircraft operation. However, the extension work of the runway has been suspended due to lack of budget. Strength of the runway is reported to be PCN 12/F/A/X/T and the pavement structure of the existing runway is as follows:

- 10-14 cm bituminous concrete (surface and base course)
- 25cm sand/gravel (sub-base course)
- Subgrade- granular

The mean longitudinal slope of the existing runway is 0.25% according to the AIP information.

## (3) Taxiway

The taxiway system consists of three exit taxiways and one parallel taxiway. The surfacing of the taxiways comprises a bituminous concrete pavement constructed in 1977. The widths of the taxiways are as follows:

- No.1 exit taxiway 14 meters;
- No.2 exit taxiway 16 meters;
- No.3 exit taxiway 14 meters;
- Parallel taxiway 14 meters.

In general, the surface of the taxiways appears to be in poor condition, and exhibits the same defects as the runway, although the extent of the damage is more, and No.3 exit taxiway and the parallel taxiway are closed at the present time. Strength of the taxiways is reported to be PCN 11/F/A/X/T and the pavement structure is as follows:

- 9 cm bituminous concrete (surface and base course)
- 25 cm sand/granule (sub-base course)
- Subgrade granular

## (4) Apron

The apron system consists of two aprons, with the main apron constructed in the terminal area and the other situated on the west of the parallel taxiway for light aircraft, such as AN-2 and helicopter K-26. The surfacing of the main apron comprises a bituminous concrete pavement constructed in 1977. There are three (3) aircraft positions for Yak-40 and An-24.

In general, the surface of the main apron appears to be in poor condition, and exhibits the same defects as the runway, although the extent of the damage is more. The west apron appears to be in very poor condition with widespread random and block pattern cracking being particularly extensive. Strength of the main apron is reported to be PCN 7/F/A/X/T and the pavement structure is as follows:

- 9 cm bituminous concrete (surface and base course)
- 25 cm sand/gravel (sub-base course)
- Subgrade granular

(5) Drainage

No drainage system is adopted as a rain water drainage system for the airfield facilities, because of the nature of soil and the low precipitation of this area.

### 3.9.4 Terminal Area Facilities (Kokand)

(1) Passenger Terminal Buildings

Terminal area is located in the middle of the airport. There are two (2) passenger buildings in the area, namely, main terminal building and departure lounge building.

The main terminal building was constructed of reinforcement concrete structure in 1977. The building has 2 stories with a capacity of 100 passengers/peak hour. Facilities in the main building are public hall, check-in booth, post office, clinic for pilot and airport staff, and baby room.

In departure lounge building, there are security check, passport control and waiting space. The building is in poor condition compared with the main terminal building.

Facilities and space for arrival passengers is not provided in the terminal building. Arrival passengers must walk through a no ceiling passage after disembarking to the curbside.

(2) Cargo Building

Presently, demand of cargo in the airport is reduced to a very low volume, and only a small volume of mail is handled.

Particular cargo terminal building is not provided. Handling of cargo has been made in the small cargo storage.

(3) Control Tower and Operation Building

Control tower and operation building is situated in a part of the main terminal building.

(4) Administration Building

Administration Building is situated next to control tower and operation building.

(5) Fire Station

Fire station is located at west part in the terminal area.

(6) Other Buildings

In the terminal area, there is a VIP building, hanger for small aircraft and a fuel storage tank.

3.9.5 Air Navigation Facilities (Kokand)

(1) Radio Nav aids and Telecommunication Facility

Most of the equipment for radio nav aids and air traffic control was installed more than 15 years ago. Shortages of spare parts is currently a serious problem to maintain the equipment.

The radar display for aerodrome control was installed in the tower control room. The ACC room is located on the first floor of the operation building. There were two sets of ACC radar console, one is being used for civil ATC and the other is for military purposes.

Table 3.9.2 Existing Radio Nav aids and Telecommunication Facilities (Kokand)

| Equipment   | Manufacturer  | Date of Installation                         | Frequency(MHz)                     | Remarks   |
|---|---|--|------------------------------------|---|
| 1. NAV AIDS<br>LOM<br>MM  | Russia<br>Russia  | 1990<br>1984                                 | 0.4<br>75                          |   |
| 2. ATC A/G<br>Aerodrome<br>ACC<br>Emergency   | Russia  | 1993   | 134.5<br>132.1<br>121.5            |   |
| 3. RADAR<br>ASR<br>SSR<br>En-route  | Russia  | 1986   | 800 band<br>1000 band<br>3000 band | 115 kW<br>1.2 kW<br>700 kW  |
| 4. AFIN<br>AMSS<br>Terminal   | Taiwan<br>Russia  | 1996   |                                    | 16 ch   |
| 5. OTHERS<br>Tape recorder<br>VDF<br>HF<br>Radio Link<br>Inter City Network<br>Engine Generator | Hungary<br>Russia<br>Russia<br>Russia<br>Russia<br>Russia | 1986<br>1985<br>1986<br>1988<br>1988<br>1986 | 4.728<br>400<br>2000               | 16 ch<br>AMS, point-point<br>Tower - LOM<br>Tower-Namangan<br>KDP:3phase 3wires<br>490V 200kWx2 |

(2) Airfield Lighting and Power Supply System

The airfield lighting was dismantled in September 1996. The condition of power supply for each individual facility is good, but power supply equipment was manufactured more than 20 years ago. Back-up engine generators were installed at each facility.

(3) Meteorological Facilities

The weather observation yard is located near the Apron. The meteorological observation system is provided in accordance with the ICAO standard. The current weather and trend forecast information is given to each air traffic control section, and also Kokand airport meteorological division plays a role as a weather observation center for Kokand city.

**Table 3.9.3 Existing Aeronautical Meteorological Facilities (Kokand)**

| Equipment                             | Manufacturer | Date of Installation | Remarks    |
|---------------------------------------|--------------|----------------------|------------|
| 1. Windvane and Anemometer            | Russian      | 1988                 |            |
| 2. Air and Dewpoint Temperature Meter | Russian      | 1982                 |            |
| 3. Barometer                          | Russian      | 1996                 |            |
| 4. Rain Gauge                         | Russian      | 1982                 |            |
| 5. Ceilometer                         | Russian      | 1982                 |            |
| 6. RVR Equipment                      | Russian      | 1982                 | Panel type |
| 7. Facsimile Recorder                 | Russian      | 1982                 |            |
| 8. Weather Telegraph                  | Russian      | 1982                 | HF and L/L |
| 9. Others                             |              |                      |            |

### 3.10 Samarkand Airport

#### 3.10.1 General (Samarkand)

Samarkand, the capital of Samarkand Province, is one of the most ancient towns in Uzbekistan. In 1970, Samarkand celebrated its 2500<sup>th</sup> anniversary. Before the 13<sup>th</sup> century the center of Samarkand was a vast hilly territory now called Afrasib, which is now one of ancient tourist spots ranked with the Registan.

Presently, Samarkand is the second largest city in Uzbekistan with a population of 360 thousand. Major industries in Uzbekistan are machine manufacturing, metal processing, chemical industries and agriculture of cotton and grain plantation

Samarkand airport, located about 8 km north of the city center, was opened as a airfield in 1927 and expanded largely with a paved runway in 1935. From 1966 to 1970, runway was extended to the present length of 3,100 m and the existing terminal building was also constructed. Now a modernization project is ongoing with the financial assistance of Japan.

#### 3.10.2 Air Traffic Volume (Samarkand)

Current air traffic volume at Samarkand airport is as shown Table 3.10.1. At present, there are scheduled flight between Domodedovo (Moscow) by Tu-154 and Tashkent with An-24 or Yak-40. Departure passenger traffic at Samarkand has been from 60 thousands to 40 thousands for the past three years.

Table 3.10.1 Air Traffic Volume (Samarkand)

| Item   |       | 1990    | 1991    | 1992    | 1993  | 1994  | 1995  | 1996  |
|--|-------|---------|---------|---------|-------|-------|-------|-------|
| Aircraft movements<br>(Take off and Landing) | Int.  |         |         |         |       |       |       |       |
|  | CIS   |         |         |         |       |       |       |       |
|  | Dom.  |         |         |         |       |       |       |       |
|  | N.A   |         |         |         |       |       |       |       |
| Total  |       | N.A.    | N.A.    | N.A.    | 2,707 | 2,070 | 2,370 | 2,008 |
| Passenger<br>(Dispatch)<br>('000)            | Int.  |         |         |         |       |       |       |       |
|  | CIS   |         |         |         |       |       |       |       |
|  | Dom.  |         |         |         |       |       |       |       |
|  | Total | 534.4   | 491.4   | 177.3   | 67.9  | 61.7  | 45.6  | *     |
| Cargo<br>(Dispatch)<br>(ton)                 | Int.  |         |         |         |       |       |       |       |
|  | CIS   |         |         |         |       |       |       |       |
|  | Dom.  |         |         |         |       |       |       |       |
|  | Total | 3,488.8 | 2,157.1 | 1,275.6 | 511.9 | 579.0 | 143.7 | *     |

#### 3.10.3 Airfield Facilities (Samarkand)

##### (1) Modernization Project

Modernization of the Samarkand airport started as one of the airports under the Three Local Airports Modernization Project in 1996 with the financial assistance from the Overseas Economic Cooperation Fund of Japan. The main objectives of the Project are to modernize the existing three local airports, namely Samarkand Airport, Bukhara Airport and Urgench Airport, as international gateways in order to encourage the economic development of



Uzbekistan. The project is planned to be implemented into two stages and the implementation work of first stage is now being conducted. The Project is anticipated to be completed at the end of 1999.

Regarding the airfield facilities in Samarkand airport, the existing runway, taxiway and apron are physically getting old and outdated today. Furthermore, due to the recent introduction of international flight services, the runway, taxiway and apron are showing inadequacy in accordance with ICAO standards.

The improvement plan for airfield facilities in the modernization project at Samarkand airport includes the following improvement plans;

- Bituminous overlay of the existing runway, taxiway and apron
- Construction of runway shoulders;
- Widening of the existing taxiways;

(2) Aerodrome Geographical Data of the Airport

- |                                   |                                   |
|-----------------------------------|-----------------------------------|
| • Geographical coordinates        | N 39° 42' 06''<br>E 066° 59' 06'' |
| • Aerodrome elevation             | 678 meters                        |
| • Aerodrome reference temperature | 36°C                              |
| • Magnetic variation              | 4° E (1994)                       |

(3) Runway

The surfacing of the central portion of the runway comprises a cement concrete pavement constructed in 1966 with dimensions of 3,100 meters long and 49 meters wide. The surfacing of both end parts of the runway comprises a bituminous concrete pavement with dimensions 350 meters long and 49 meters wide at each end. The strength of the runway is reported to be PCN 29/R/C/X/T and is expected to be PCN 53/R/C/X/T after improvement. The pavement structure after overlay has the following thickness:

a) Central portion

- |            |                              |
|------------|------------------------------|
| • 22-24 cm | bituminous concrete overlay; |
| • 22~24 cm | cement concrete slab;        |
| • 18 cm    | sand/gravel (sub-base).      |

b) Both end portions

- |         |   |
|---------|---|
| • 28 cm | bituminous concrete (surface and base course) |
| • 23 cm | gravel (upper sub-base course)                |
| • 40 cm | sand/gravel (lower sub-base course)           |

The mean longitudinal slope of the runway is 0.42% according to AIP information.

(4) Taxiway

The taxiway system consists of three exit taxiways and one parallel taxiway. The surfacing of the taxiways comprises a cement concrete pavement constructed in 1966 and were re-paved by bituminous concrete 10 cm thick in 1996. The strength of the existing taxiways are reported as follows:

- No.1 exit taxiway PCN 23/R/B/X/T;
- No. 2 exit taxiway PCN 25/R/B/X/U;
- No. 3 exit taxiway PCN 18/R/B/X/T;
- Parallel taxiway PCN 25~29/R/B/X/U,T.

The strength after overlay of the taxiway is expected to be PCN 44/R/B/X/T. Pavement structure after overlay has the following thickness:

- 5-10 cm bituminous concrete overlay;
- 10 cm bituminous concrete;
- 27 cm cement concrete slab;
- 18 cm sand/gravel(sub-base)

The width of the existing taxiways is 18m~21m and are planned to be 23 m in the Project in accordance with ICAO standards.

#### (5) Apron

The surfacing of the main apron comprises a cement concrete pavement constructed in 1966. There are twenty five (25) aircraft positions, of which nine (9) are for TU-154 and IL-18 class aircraft and sixteen (16) for TU-134, YaK-40 and AN-24 class aircraft.

The surface of the main apron appears to be in poor condition and is now expected to be overlaid partially by bituminous concrete with 5~15 cm thick. Strength of the existing main apron is reported to be PCN 29/R/B/X/T and is expected to be PCN 44/R/B/X/T after pavement overlay. The pavement structures are as follows:

##### a) Existing portion

- 27 cm cement concrete slab
- 18 cm sand/gravel sub-base

##### b) Improved portion

- 5-15 cm bituminous concrete overlay
- 27 cm cement concrete slab
- 18 cm sand/gravel sub-base.

#### (6) Drainage

Underground piping system is adopted as a rain water drainage system for the airfield facilities. Collected water is lead to the open channel through pipe culverts. It seems that the existing drainage system is sufficient functionally.

### 3.10.4 Terminal Area Facilities (Samarkand)

#### (1) Modernization Project

Modernization project in Samarkand airport includes the following building works:

- Construction of international arrival building
- Renovation of existing passenger terminal building
- Renovation of cargo building

- Construction of control tower & operation building
- Construction of fire station

**(2) Passenger Terminal Building**

The terminal complex is located near the east end of the runway having an area of about 50 hectares. In this area, there is the passenger building, control tower and other buildings and facilities.

The existing terminal building constructed in 1970 has a floor area of 5,340 m<sup>2</sup> in 2 stories of reinforcement concrete structure. The building was only for domestic use in the former Soviet Union era. Recently, the inside of the building was modified and divided by a partition wall so as to handle international flights. Facility for arrival passenger is located in the other building next to the passenger building terminal building.

In the modernization project, the international arrival building is to be constructed in the first stage, and renovation of the existing passenger terminal building will be made in the second stage.

**(3) Control Tower and Operation Building**

The existing control tower and operation building, located to the west of the passenger terminal building, has a floor area of about 1,590 m<sup>2</sup> with 2 stories for office and equipment space and 4 stories for control tower. New control tower and operation building with a floor area of 750 m<sup>2</sup> is to be constructed under the modernization project.

**(4) Cargo Terminal Building**

There are two cargo storage buildings with office space and one truck weighing station. After independence, cargo demand declined extremely, so these facilities are not fully used. In the modernization project, these buildings are to be rehabilitated.

**3.10.5 Air Navigation Facilities (Samarkand)**

**(1) Modernization Project**

Modernization Project includes the following items for Air Navigation Facilities;

- Installation of ILS conforming to the ICAO standards
- Installation of airfield lighting
- Installation of NDB, VDF and ASR/SSR
- Installation of ATC communication facilities
- Installation of AFTN and Meteorological facilities
- Installation of electric power supply system

**(2) Radio Nav aids and Telecommunication Facilities**

The existing radio nav aids and telecommunication facilities are as shown below.

**Table 3.10.2 Existing Radio Nav aids and Telecommunication Facilities (Samarkand)**

| Equipment  | Manufacturer  | Date of Installation                         | Frequency (MHz)  | Remarks   |
|--|---|--|--|---|
| 1. ILS<br>ILZ<br>GP<br>IMM<br>LOM  | Thomson   | 1997   | 109.5<br>332.6<br>1.055<br>0.52                                      | ID: IMZ<br>RWY 09                                 |
| 2. ATC<br>A/G<br>Airdrome<br>App/Circle<br>Ground<br>APP<br>APP<br>ACC<br>ACC<br>Emergency | Russia  | 1988   | 118.3<br>133.0<br>121.8<br>123.7<br>120.8<br>134.3<br>135.1<br>121.5 |   |
| 3. RADAR<br>ASR<br>SSR<br>En-route   | Russia  | 1986   | 800 band<br>1000 band<br>3000 band                                   | 150 kW<br>1.2 kW<br>4.8 MW                        |
| 4. AFTN<br>AMSS  | IBM   | 1995   |  | 16 ch (IBM)                                       |
| 5. OTHERS<br>RSBN<br>Tape recorder<br>VDF<br>HF<br>Radio Link<br>Inter City Network        | Russia<br>Hungary<br>Russia<br>Russia<br>Russia<br>Russia | 1990<br>1986<br>1986<br>1986<br>1986<br>1986 | 900 band<br><br><br><br><br>2000                                     | NAV system<br>16 ch<br>AMS,RTTY<br>30 ch OM-Tower |

**(3) Airfield Lighting and Power Supply System**

The existing radio nav aids and telecommunication facilities are as shown below:

**Table 3.10.3 Existing Airfield Lighting Facilities (Samarkand)**

| Equipment                | Manufacturer | Date of Installation | Remarks                                       |
|--------------------------|--------------|----------------------|---|
| 1. Approach Light        | TESLA        | 1987                 | RWY 09  |
| 2. Simple Approach Light | TESLA        | 1987                 | RWY 27  |
| 3. Runway Edge Light     | TESLA        | 1987                 |   |
| 4. Threshold Light       | TESLA        | 1987                 |   |
| 5. Taxiway Edge Light    | TESLA        | 1987                 |   |
| 6. Taxiing Guidance Sign | TESLA        | 1987                 |   |
| 7. Turning Pad Light     | TESLA        | 1987                 |   |
| 8. Apron Flood Light     | USSR         | 1983                 |   |
| 9. Engine Generator      | USSR         | 1980                 | 1P2, 1P3<br>3 phase 3 wires 400v<br>150 kVAx2 |
| 10. Others               |              |                      |   |

**(4) Meteorological Facilities**

The existing radio nav aids and telecommunication facilities are as shown below:

**Table 3.10.4 Existing Aeronautical Meteorological Facilities (Samarkand)**

| Equipment                             | Manufacturer | Date of Installation | Remarks     |
|---------------------------------------|--------------|----------------------|-------------|
| 1. Windvane and Anemometer            | Russian      | 1986                 |             |
| 2. Air and Dewpoint Temperature Meter | Russian      | 1986                 |             |
| 3. Barometer                          | Russian      | 1986                 |             |
| 4. Rain Gauge                         | Russian      | 1986                 |             |
| 5. Rain Sonde                         | Russian      | 1986                 |             |
| 6. Ceilometer                         | Russian      | 1986                 |             |
| 7. RVR Equipment                      | Russian      | 1986                 | Panel type  |
| 8. Facsimile Recorder                 | Russian      | 1986                 |             |
| 9. Weather Radar                      | Russian      | 1986                 |             |
| 10. Weather Information System        | Russian      | 1986                 | VHF channel |

### 3.11 Termez Airport

#### 3.11.1 General (Termez)

Termez city is the capital of Sukhandaria Province, with a population of about 107 thousand, and it is located just on the frontiers of Uzbekistan, separated by the Amu-Darya river with Afghanistan. During the former Soviet Union era, it was a restricted area not only for foreigners but for other people who were not residents of the city.

The airport is located 9 km north of the city center and has a 3,000 m-long runway. Initially, the airport was opened in 1952, and the runway was extended to the present length of 3,000 m in 1972.

In 1989, improvement of the runway by placing precast reinforcement concrete slabs and overlay work of the taxiway pavement was made in order to accept Tu-154 and IL-76 operation. In 1993, a certification of international airport under MAK regulations was obtained.

In the terminal area, an administration building was constructed in 1955, the passenger terminal building and fire station in 1979 respectively, then, a small hanger was completed in 1981, and a new control tower was installed in 1989.

Sarassiva airport located to the frontiers with Tajikistan was managed and operated under the control of Termez airport as an annex airport since August 1976.

#### 3.11.2 Air Traffic Volume (Termez)

Current air traffic volume of Termez airport is as shown in Table 3.11.1. At present, there are three (3) daily flights between Tashkent with Yak-40 and An-24, and one (1) weekly flight between Moscow via Nukus by Tu-154. Before 1994, there were scheduled flights between Almaty, Ashgabad, Minerralniye Vody in CIS countries and Samarkand, Andizhan, Fergana, Namangan and Bukhara in Uzbekistan.

Passenger volume in 1996 was 82 thousand domestic passengers and approximate 4 thousand CIS route passengers. Compared with the traffic volume in 1991, passenger traffic declined to 39 percent, in particular, passengers on CIS route decreased to 13 percent.

Table 3.11.1 Air Traffic Volume (Termez)

| Item  |       | 1990  | 1991  | 1992  | 1993  | 1994  | 1995  | 1996  | 96/95 | 96/94 |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aircraft movements<br>(Take off and Landing)        | Int.  | -     | -     | -     | -     | -     | -     | -     |       |       |
|   | CIS   | -     | 448   | 490   | 250   | 134   | 106   | 90    | 0.85  | 0.20  |
|   | Dom.  | 7,638 | 6,006 | 5,272 | 3,956 | 3,200 | 3,176 | 2,882 | 0.91  | 0.48  |
|   | N.S   | 128   | 132   | 14    | 38    | 28    | 506   | 434   | 0.86  | 3.29  |
|   | Total | 7,766 | 6,586 | 5,776 | 4,244 | 3,362 | 3,788 | 3,406 | 0.90  | 0.52  |
| Passenger<br>(Dispatch and disembarkation)<br>(000) | Int.  | -     | -     | -     | -     | -     | -     | -     |       |       |
|   | CIS   | -     | 28.2  | 15.0  | 7.3   | 8.1   | 6.3   | 3.8   | 0.60  | 0.13  |
|   | Dom.  | 230.9 | 210.7 | 145.8 | 101.1 | 84.5  | 79.6  | 82.3  | 1.03  | 0.39  |
|   | Total | 230.9 | 238.9 | 160.8 | 108.4 | 92.6  | 85.9  | 86.1  | 1.00  | 0.36  |
| Cargo<br>(Dispatch and disembarkation)              | Int.  | -     | -     | -     | -     | -     | -     | -     |       |       |
|   | CIS   | -     | 613.5 | 190.2 | 96.6  | 38.0  | 14.4  | 11.4  | 0.79  | 0.02  |
|   | Dom.  | 446.8 | 81.7  | 63.9  | 55.1  | 153.1 | 58.6  | 41.0  | 0.70  | 0.50  |
|   | Total | 446.8 | 695.2 | 254.1 | 151.7 | 191.1 | 73.0  | 52.4  | 0.72  | 0.08  |

### 3.11.3 Airfield Facilities (Termez)

#### (1) Aerodrome Geographical Data

- Geographical coordinates N 37° 17' 11''  
E 067° 18' 33''
- Aerodrome elevation 313 meters
- Aerodrome reference temperature 38° C
- Magnetic variation 3° E (1995)

#### (2) Runway

The surfacing of the runway comprises a precast reinforced concrete pavement constructed in 1989 with dimensions of 3,000 meters long and 42 meters wide. In general, the surface of the runway appears to be in rather good condition, although some lack of joint sealing was observed during the site inspection. Strength of the runway is reported to be PCN 19/R/A/X/U and the pavement structure is as follows:

- 14 cm precast reinforced concrete slab
- 5cm sand leveling course
- 20 cm crush run upper sub-base
- 50 cm gravel lower sub-base
- Sandy silt subgrade

The mean longitudinal slope of the runway is 0.14% according to AIP information.

#### (3) Taxiway

The taxiway system consists of two exit taxiways, one parallel taxiway and three onnection taxiways. The surfacing of the taxiways comprises a bituminous concrete pavement constructed in 1989. The widths of the taxiways are as follows:

- No.1 exit taxiway                      20 meters;
- No.2 exit taxiway                      20 meters;
- Parallel taxiway                        42 meters;
- No.3 connection taxiway            20 meters.
- No.4 connection taxiway            30 meters
- No.5 connection taxiway            8 meters

In general, the surface of the taxiways appears to be in rather good condition, although longitudinal and transverse cracking was observed during the site inspection. Strengths of the taxiways are reported as follows:

- No.1 exit taxiway                      PCN 62/F/C/Y/T
- No.2 exit taxiway                      PCN 62/F/C/Y/T
- Parallel taxiway                        PCN 62/F/C/Y/T
- No.3 connection taxiway            PCN 30/F/C/Y/T
- No.4 connection taxiway            PCN 24/F/C/Y/T
- No.5 connection taxiway            PCN 12/F/C/Y/T

The pavement structure of the exit taxiways and No.3 connection taxiway is as follows:

- 20 cm                                      bituminous concrete (surface and base course)
- 20 cm                                      crusher run ( upper sub-base course)
- 50 cm                                      sand/gravel (lower sub-base course)
- Subgrade                                 sandy silt

The pavement structure of the parallel taxiway is as follows:

- 9 cm                                        bituminous concrete (surface and base course)
- 22 cm                                      crushed aggregate (upper sub-base course)
- 55 cm                                      sand/gravel (lower sub-base course)
- Subgrade                                 sandy silt

The pavement structure of No.4 and No.5 connection taxiways is as follows:

- 12 cm                                      bituminous concrete (surface and base course)
- 10 cm                                      crushed aggregate (upper sub base course)
- 18 cm                                      sand/gravel (lower sub-base course)
- Subgrade                                 sandy silt

#### (4) Apron

The apron system consists of two aprons, and the main apron is located in the terminal area and the other is situated to the east of the main apron for light aircraft such as the AN-2. The surfacing of the main apron comprises a bituminous concrete pavement constructed in 1989. There are seven aircraft positions, of which two positions are for TU-154 and five positions for YaK-40 and AN-24. In general, the surface of the main apron appears to be in

rather good condition, although longitudinal and transverse cracks were observed during the site inspection.

Strength of the main apron is reported to be PCN 62/F/C/Y/T and the pavement structure is as follows:

- 20 cm bituminous concrete (surface and base course)
- 20 cm crushed aggregate ( upper sub-base course)
- 50 cm sand/gravel (lower sub-base course)
- Subgrade sandy silt (subgrade)

The surfacing of the other apron comprises a cement concrete pavement constructed in 1989. There are about thirty (30) aircraft positions for light aircraft AN-2. In general the surface of the apron for light aircraft appears to be in very poor condition and the following defects were observed during the site inspection:

- longitudinal and transverse cracks;
- corner breaks;
- joint seal damage;
- scaling;
- settlement and fault;
- shattered slab
- spalling

The pavement structure of the apron for light aircraft is as follows:

- 22 cm cement concrete slab
- 50 cm sand/gravel sub-base
- Subgrade sandy silt

#### (5) Drainage

No drainage system is adopted as a rain water drainage system for the airfield facilities.

### 3.11.4 Terminal Area Facilities (Termez)

#### (1) Passenger Terminal Building

The terminal area is located near the east part of runway, which is generally divided into two blocks, namely, passenger handling block in the east part and administration block in west part.

The passenger terminal building was constructed of reinforcement concrete structure in 1979 at the center of the east block. Floor area is 2,200 m<sup>2</sup> with 1 story. Facilities in the building are public hall, check-in booth, office restaurant and pharmacy.

The departure lounge is provided separately to the passenger building, in which there are security check, passport control and waiting space. The building and lounge is in poor condition.

Facilities and space for arrival passengers is not provided in the terminal building. Arrival passengers have to walk through a no ceiling passage after disembarking to the curbside.



(2) Cargo Terminal Building

Cargo had been handled at a storage area in the administration block, but presently the demand has decreased extremely.

(3) Control Tower and Operation Building

The control tower located on the second floor of the terminal building is currently not in function. Air traffic control is being made in the starter building at the runway ends and the ATC room in the terminal building.

(4) Administration Building

The administration building is located to the east of the passenger building. It was constructed of brick structure with 1 story and a floor area of 420 m<sup>2</sup> in 1955.

(5) Fire Station

The fire station is located to the east of the VIP building. It was constructed of brick structure with 1 story and a floor area of 216 m<sup>2</sup> in 1979.

(6) Other Building

In the terminal area, there is the VIP building constructed by Termez city, 600 m<sup>2</sup> -wide hanger for An-2 constructed in 1981, fuel tank with a capacity 1,600 kl and garage.

(7) Access Road and Car Park

Access road to the airport has 2 lanes with 15 m wide. Capacity of the car park is 80 vehicles and its area is 1,200 m<sup>2</sup>.

(8) Utilities

Electric power is supplied with 2 lines from the main line, 36/6 kv to the main transformers of 400 kvA in the airport.

Water supply is made from wells in the airport and supply capacity is about 29 kl per day.

Sewage is treated by chemistry cleaning method and its capacity is 36 m<sup>3</sup>/hour.

External telephones, 12 lines.

### 3.11.5 Air Navigation Facilities (Termez)

(1) Radio Nav aids and Telecommunication

Most of the equipment for radio nav aids and air traffic control was installed more than 10 years ago, and there's a problem of shortage of spare parts. Aerodrome control radar display and traffic radar control display were installed in the same room in the passenger terminal building.

Outline of existing radio nav aids and radio telecommunication facilities is as follows :

**Table 3.11.2 Existing Radio Nav aids and Telecommunications (Termez)**

| Equipment   | Manufacturer                                    | Date of Installation                 | Frequency (MHz)                    | Remarks                       |
|---|---|--------------------------------------|------------------------------------|-------------------------------|
| 1. ILS<br>ILZ<br>GP<br>1MM<br>LOM   | Russia  | 1990                                 | 110.3<br>335.0<br>0.193<br>0.398   | ID: INO<br>RWY 25             |
| 2. VOR / DME  | ALCATEL   | 1987                                 | 113.4<br>1168, 1105                | VOR 100w<br>DME 1kw<br>ID: NO |
| 3. ATC A/G<br>Airdrome<br>ACC<br>Emergency                                  | Russia  | 1988                                 | 118.6<br>134.3<br>121.5            |                               |
| 4. RADAR<br>ASR<br>SSR<br>En-route  | Russian   | 1985<br>1985<br>1988                 | 800 band<br>1000 band<br>3000 band | 115kw<br>1.2kw<br>850kw       |
| 5. AFTN<br>MSS  | Russia  | 1982                                 |                                    | teletype                      |
| 6. OTHERS<br>Tape recorder<br>VDF<br>HF<br>Radio Link<br>Inter City Network | Hungary<br>Russia<br>Russia<br>Russia<br>Russia | 1986<br>1985<br>1989<br>1988<br>1988 | 4.185, 2.635                       | RTTY                          |

**(2) Airfield Lighting and Power Supply System**

The airfield lighting system was installed 8 years ago, except taxiway edge lights. Taxiway edge light are outdated, but well maintained. Power supply equipment was manufactured more than 20 years ago, but it is in good condition. Back-up engine generators were installed to each facility. Outline of existing airfield lighting facilities is as follows :

**Table 3.11.3 Existing Airfield Lighting Facilities (Termez)**

| Equipment                | Manufacturer | Date of Installation | Remarks   |
|--------------------------|--------------|----------------------|---|
| 1. Approach Light        | Russia       | 1989                 | RWY 25  |
| 2. Runway Edge Light     | Russia       | 1989                 |   |
| 3. Threshold Light       | Russia       | 1989                 |   |
| 4. Taxiway Edge Light    | Czech        | 1971                 |   |
| 5. Taxiing Guidance Sign | Russia       | 1989                 |   |
| 6. Turning Pad Light     | Russia       | 1989                 |   |
| 7. Apron Flood Light     | Russia       | 1982                 |   |
| 8. Engine Generator      | Russia       | 1989                 | AFL : 3 phase 3 wires, 400 V, 50 kWx2<br>KDP : 3 phase 3 wires<br>400 V, 100kWx1<br>50 kWx1 |
| 9. Others                |              |                      |   |

**(3) Meteorological Facilities**

Weather observation yard is located at the Starter Control Building near the end of the Runway. The meteorological observation system is provided in accordance with ICAO standards. The current weather and trend forecast information is given to each air traffic control section, and also Termez airport meteorological division plays a role as a weather

observation center in Shukhadaria Province. Outline of existing aeronautical meteorological facilities is as shown below.

**Table 3.11.4 Existing Aeronautical Meteorological Facilities ((Termez)**

| Equipment                             | Manufacturer | Date of Installation | Remarks                      |
|---------------------------------------|--------------|----------------------|------------------------------|
| 1. Windvane and Anemometer            | Russian      | 1986                 |                              |
| 2. Air and Dewpoint Temperature Meter | Russian      | 1986                 |                              |
| 3. Barometer                          | Russian      | 1986                 |                              |
| 4. Rain Gauge                         | Russian      | 1986                 |                              |
| 5. Ceilometer                         | Russian      | 1986                 |                              |
| 6. RVR Equipment                      | Russian      | 1990                 | Transmission meter and panel |
| 7. Facsimile Recorder                 | Russian      | 1986                 |                              |
| 8. Weather Information System         | Russian      | 1986                 | VHF channel                  |
| 9. Others                             |              |                      |                              |

### 3.12 Karshi Airport

#### 3.12.1 General (Karshi)

Karshi city is one of the capital of in Kashkadarya Province with a population of 190 thousand.

Karshi is known as the center of the gas and oil industry in Uzbekistan, because there is one of the biggest gas processing plant in Shurtan, which is near to Karshi. Furthermore, it is said that deposits of natural gas in Kashkadarya are the biggest in Uzbekistan and almost 3/4<sup>th</sup> of gas in Uzbekistan is produced there.

Karshi airport is located 5 km north of the city center. The airport was constructed with a 1,200 m-long runway by the military in 1954, and was transferred to civil aviation use in 1957. In 1987, the runway was extended to the existing length of 2,900 m. Up to the present, terminal buildings were reconstructed three times, and the latest building was built in 1988.

#### 3.12.2 Air Traffic Volume (Karshi)

Current air traffic volume at Karshi airport is as shown in Table 3.12.1. At present, there are three (3) daily flights between Tashkent with Yak-40 and An-24, and two (2) weekly flights between Domodedovo (Moscow) via Andizhan by Tu-154. Before 1994, there were scheduled flights between Almaty, Ashgabad, Minerralniye Vody in CIS countries and Samarkand, Andizhan, Fergana, Namangan and Bukhara in Uzbekistan.

Air passenger traffic in 1996 was 26 thousands departure passengers, and since 1993 passenger traffic has increased slightly.

**Table 3.12.1 Air Traffic Volume (Karshi)**

| Item   |       | 1990  | 1991  | 1992  | 1993  | 1994  | 1995  | 1996  | 96/95 | 96/91 |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aircraft movements<br>(Take off and Landing) | Int.  | -     | -     | -     | -     | -     | -     | -     |       |       |
|  | CIS   | 908   | 964   | 444   | 196   | 244   | 352   | 138   | 0.39  | 0.14  |
|  | Dom.  | 6,478 | 6,040 | 2,826 | 1,908 | 1,936 | 2,118 | 2,198 | 1.04  | 0.36  |
|  | N.S   | 1,200 | 820   | 145   | 85    | 64    | 386   | 494   | 1.28  | 0.60  |
|  | Total | 8,586 | 7,824 | 3,415 | 2,189 | 2,244 | 2,856 | 2,830 | 0.99  | 0.36  |
| Passenger<br>(Dispatch)<br>(000)             | Int.  | -     | -     | -     | -     | -     | -     | -     |       |       |
|  | CIS   | 80.5  | 66.8  | 3.1   | 4.2   | 6.6   | 11.5  | 4.0   | 0.35  | 0.06  |
|  | Dom.  | 77.6  | 80.6  | 65.6  | 18.9  | 19.8  | 22.2  | 22.4  | 1.01  | 0.28  |
|  | Total | 158.1 | 147.4 | 68.7  | 23.1  | 26.4  | 33.7  | 26.4  | 0.78  | 0.18  |
| Cargo<br>(Dispatch)<br>(ton)                 | Int.  | -     | -     | -     | -     | -     | -     | -     |       |       |
|  | CIS   | 59.7  | 178.9 | 14.0  | 5.8   | 17.9  | 16.5  | 2.7   | 0.16  | 0.02  |
|  | Dom.  | 73.2  | 56.4  | 20.7  | 3.1   | -     | 2.4   | 1.8   | 0.75  | 0.03  |
|  | Total | 132.9 | 235.3 | 34.7  | 8.9   | 17.9  | 18.9  | 4.5   | 0.24  | 0.02  |

### 3.12.3 Airfield Facilities (Karshi)

#### (1) Aerodrome Geographical Data

- Geographical coordinates N 38° 48'  
E 065° 46'
- Aerodrome elevation 374 meters
- Aerodrome reference temperature NA
- Magnetic variation 4° E (1994)

#### (2) Runway

The surfacing of the runways comprises a bituminous concrete pavement constructed in 1987 with dimensions of 2,900 meters long and 42 meters wide.

The surfacing of the runway was partially re-paved (1400 meters from the 16 threshold) with 6 cm thick bituminous concrete in 1991 and re-paving of the remaining portion has been suspended due to a lack of finance.

In general, the surface of the re-paved portion of the runway appears to be in rather good condition although longitudinal and transverse cracks were observed during the site inspections. However, the surface of the remaining portion of the runway appears to be in very poor condition and the following defects were observed during the site inspection:

- large cracks in the longitudinal and transverse directions;
- alligator cracks ;
- raveling and weathering;

Strength of the runway is reported to be PCN 17/F/B/X/E and the pavement structures of the runway are as follows:

#### a) Re-paved portion;

- 46 cm bituminous concrete (surface and base course);
- 40 cm gravel (sub-base course);

- Subgrade                      silt
- b) Remaining portion ;
- 40 cm                              bituminous concrete (surface and base course)
  - 40cm ~ 80 cm                      gravel (sub-base course)
  - Subgrade                              clay sand/silt

The mean longitudinal slope of the runway is 0.1% according to the AIP information.

(3) Taxiway

The taxiway system consists of four exit taxiways and one parallel taxiway. The surfacing of the taxiways comprises a bituminous concrete pavement constructed in 1987. In general, the surface of the taxiways appears to be in very poor condition and exhibits the same defects as the original portion of the runway. Width of the taxiways is reported to be 20 meters.

Strength of the taxiways is reported to be PCN 12~17/F/B/X/T and the pavement structure is as follows:

- 24 cm                              bituminous concrete (surface and base course)
- 20 cm                              gravel (sub-base course)
- Subgradesilt

(4) Apron

The surfacing of the apron comprises a bituminous concrete pavement constructed in 1987. There are ten aircraft positions for YaK-40 and AN-24 class aircraft. In general, the surface of the apron appears to be in very poor condition and exhibits the same defects as the original portion of the runway. Strength of the apron is reported to be PCN 16~18 /F/B/X/T and the pavement structure is as follows:

- 20 cm                              bituminous concrete (surface and base course)
- 30 cm                              gravel (sub-base course)
- Subgrade                              silt

(5) Drainage

Pumping-up and underground piping system is adopted as an underground and rain water drainage system for the airfield facilities. It seems that the existing drainage system is sufficient functionally because of the low precipitation of this area.

**3.12.4 Terminal Area Facilities (Karshi)**

(1) Passenger Terminal Building

The terminal area is located in the area between the runway and a road passing parallel to the runway in front of the terminal area.

The passenger terminal building was constructed of reinforcement concrete structure with 2 stories in 1988. The floor area is 2,400 m<sup>2</sup> with a capacity of 200 passengers per hour. Facilities in the building are public hall, check-in booth, post office, bank, baby room, catering, and a barber.

Facilities and space with baggage claim for arrival passengers is provided in the terminal building. This area was formerly used for CIS flights.

(2) Cargo Terminal Building

Cargo handling is to be done in the passenger terminal building, but currently, there is no cargo demand.

(3) Control Tower and Operation Building

The former terminal building constructed in 1958 is being used for the control tower, operation building and administration building of NAC since 1988.

(4) Fire Station

The fire station was constructed of brick structure with 1 story and a floor area of 216 m<sup>2</sup> in 1979.

(5) Other Building

In the terminal area, there is a VIP building, hangers, fuel tank area, garage and storage.

3.12.5 Air Navigation Facilities (Karshi)

(1) Radio Nav aids and Telecommunication

Existing equipment for radio nav aids and air traffic control facilities were installed around 10 years ago, but a part of the radio telecommunication equipment was manufactured more than 15 years ago. There is a problem of shortages of spare parts. Airdrome radar display was installed at the tower control room for airdrome control. The outline of existing radio nav aids and radio telecommunication facilities is as follows :

Table 3.12.2 Existing Radio Nav aids and Telecommunication Facilities (Karshi)

| Equipment   | Manufacturer                                    | Date of Installation                 | Frequency (MHz)                  | Remarks          |
|---|---|--------------------------------------|----------------------------------|------------------|
| 1. ILS<br>ILZ<br>GP<br>LMM<br>LOM   | Russia  | 1994                                 | 109.1<br>109.1<br>0.301<br>0.622 | RWY 16           |
| 2. ATC AG<br>Airdrome   | Russia  | 1988                                 | 124.4                            |                  |
| 3. RADAR<br>ASR<br>SSR  | Russia  | 1990                                 | 800 band<br>1000 band            | 115 kW<br>1.2 kW |
| 4. AFTN   | Russia  | 1987                                 |                                  | teletype         |
| 5. OTHERS<br>Tape recorder<br>VDF<br>HF<br>Radio Link<br>Inter City Network | Hungary<br>Russia<br>Russia<br>Russia<br>Russia | 1989<br>1987<br>1989<br>1988<br>1987 |                                  | 16 ch<br>RTTY    |

(2) Airfield Lighting and power supply system

The airfield lighting system was installed 15 years ago and there is a problem of shortages of spare parts, but operational function is in normal condition. The condition of power supply for each individual facility is good. Back-up engine generators were installed for each individual facility.

**Table 3.12.3 Existing Airfield Lighting Facilities (Karshi)**

| Equipment                | Manufacturer | Date of Installation | Remarks                                |
|--------------------------|--------------|----------------------|--|
| 1. Approach Light        | Czech        | 1982                 | RWY 09, 27                             |
| 2. Runway Edge Light     | Czech        | 1982                 |  |
| 3. Threshold Light       | Czech        | 1982                 |  |
| 4. Taxiway Edge Light    | Czech        | 1982                 |  |
| 5. Taxiing Guidance Sign | Czech        | 1982                 |  |
| 6. Turning Pad Light     | Czech        | 1982                 |  |
| 7. Apron Flood Light     | Czech        | 1982                 |  |
| 8. Engine Generator      | USSR         | 1989                 | AFL : 3 phase 3 wires<br>400 V 50 kWx2 |
|                          | USSR         | 1978                 | KDP : 3 phase 3 wires<br>400 V 50 kWx2 |
| 9. Others                |              |                      |  |

**(3) Meteorological Facilities**

Meteorological observation system is provided in accordance with ICAO standard. Current weather and trend forecast information is given to each air traffic control section, and also Karshi airport meteorological division plays a role as a weather observation center for Kashkadarya Province.

**Table 3.12.4 Existing Aeronautical Meteorological Facilities (Karshi)**

| Equipment                             | Manufacturer | Date of installation | Remarks    |
|---------------------------------------|--------------|----------------------|------------|
| 1. Windvane and Anemometer            | Russian      | 1986                 |            |
| 2. Air and Dewpoint Temperature Meter | Russian      | 1986                 |            |
| 3. Barometer                          | Russian      | 1986                 |            |
| 4. Rain Gauge                         | Russian      | 1986                 |            |
| 5. Ceilometer                         | Russian      | 1986                 |            |
| 6. RVR Equipment                      | Russian      | 1986                 | Panel type |
| 7. Others                             |              |                      |            |

**3.13 Bukhara Airport**

**3.13.1 General (Bukhara)**

Bukhara is the capital of Bukhara Province with a population of 238 thousand and is one of the ancient cities in Central Asia. Throughout all time, Bukhara remained as the center of the caravan trade route between Europe and Asia.

Today Bukhara has become a major industrial, culture and tourism center of Uzbekistan, and major industries are gas, oil, cotton processing, Astrakhan textile and cocoon processing.

The Bukhara airport was opened in 1938 with an unpaved runway. In 1964, a paved runway, taxiway, and apron and terminal building was completed and air navigation facilities in 1968. Thereafter, the existing facilities including the runway and terminal building were completed in 1980

### 3.13.2 Air Traffic Volume (Bukhara)

The current air traffic volume for Bukhara airport is as shown in Table 3.13.1. At present, there are scheduled flight to Domodedovo (Moscow) and Tashkent from Bukhara airport. Recent traffic tendency is stable at a level having approx. 40-50 thousands.

**Table 3.13.1 Air Traffic Volume (Bukhara)**

| Item                               |       | 1990  | 1991  | 1992  | 1993  | 1994  | 1995  | 1996  | 96/95 | 96/91 |
|------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aircraft<br>movements<br>(Landing) | Int.  |       |       |       |       |       |       |       |       |       |
|                                    | CIS   |       |       |       |       |       |       |       |       |       |
|                                    | Dom.  |       |       |       |       |       |       |       |       |       |
|                                    | N.S   |       |       |       |       |       |       |       |       |       |
|                                    | Total | 4,163 | 4,348 | 2,396 | 1,351 | 1,537 | 1,423 | 2,576 |       |       |
| Passenger<br>(Dispatch)<br>('000)  | Int.  |       |       |       |       |       |       |       |       |       |
|                                    | CIS   |       |       |       |       |       |       |       |       |       |
|                                    | Dom.  |       |       |       |       |       |       |       |       |       |
|                                    | Total | 199.5 | 195.0 | 78.0  | 34.6  | 42.1  | 44.1  | *     |       |       |
| Cargo<br>(Dispatch)<br>(ton)       | Int.  |       |       |       |       |       |       |       |       |       |
|                                    | CIS   |       |       |       |       |       |       |       |       |       |
|                                    | Dom.  |       |       |       |       |       |       |       |       |       |
|                                    | Total | 976   | 1,191 | 397   | 73    | 283   | 112   | *     |       |       |

### 3.13.3 Airfield Facilities (Bukhara)

#### (1) Modernization Project

Modernization of the Bukhara airport started as one of airports under the Three Local Airports Modernization Project in 1996 with financial assistance from the Overseas Economic Cooperation Fund of Japan. The main objectives of the Project is to modernize the existing three local airports, namely Samarkand Airport, Bukhara Airport and Urgench Airport, as international gateways in order to encourage the economic development of Uzbekistan.

The project is planned to be implemented in two stages and the implementation work of the first stage is now being conducted. The Project is anticipated to be completed at the end of 1999.

Regarding airfield facilities at Bukhara airport, the existing runway, taxiway and apron are physically getting old and outdated today. Furthermore, due to the recent introduction of international flight services, the runway, taxiway and apron are showing inadequacy in accordance with ICAO standards.

The improvement plan for airfield facilities in the modernization project at Bukhara airport includes the following improvement plans;

- Bituminous overlay of the existing runway, taxiway and apron
- Construction of runway shoulders;
- Widening of the existing taxiways;



(2) Aerodrome Geographical Data

- geographical coordinates N 39° 46'30";  
E 064° 28'48";
- airdrome elevation 229m;
- airdrome reference temperature 35°C;
- magnetic variation 5°E (1995).

(3) Runway

The surfacing of the runway comprises a cement concrete pavement constructed in 1980 with dimensions of 3000 meters long and 45 meters wide. The surface of the runway appears to be in poor condition and is now being overlaid 12 cm thick by bituminous concrete.

Strength of the runway is reported to be PCN 17/R/A/X/T and is expected to be PCN 35/R/A/X/T after re-paving.

The improved pavement structure is as follows:

- 13 cm bituminous concrete overlay;
- 29 cm cement concrete slab;
- 20 cm sand cement (upper sub-base);
- 40 cm sand/gravel (lower sub-base)

The mean longitudinal slope of the runway is 0.17% according to AIP information.

(4) Taxiway

The main taxiway system consists of two exit taxiways and one parallel taxiway between the runway and the west apron. The surfacing of the main taxiways comprises a bituminous concrete pavement constructed in 1980. The surface of the main taxiways appears to be in poor condition and are now planned to be repaved with 10 cm thick bituminous concrete. Strength of the main taxiways is reported to be PCN 31/F/C/Y/T and is expected to be PCN 59/F/C/Y/T after re-paving. The improved pavement structure is as follows:

- 10 cm bituminous concrete overlay (surface course);
- 12 cm bituminous concrete (base course);
- 20 cm gravel (upper sub-base course)
- 50 cm sand/gravel (lower sub-base course).

The widths of the main taxiways are 22 meters and are expected to be 23 meters in accordance with ICAO standards.

The widths of the other taxiways are 10-18 meters and strength of the taxiways are reported to be PCN 26/F/C/Y/T.

(5) Apron

The west apron system consists of two aprons, and apron No. 1 is utilized as the main apron. The surfacing of the main apron comprises a cement concrete pavement constructed in 1980.

There are four (4) aircraft positions, of which two (2) are for A-310-300 class aircraft and two (2) for YK-40 and AN-24 class aircraft.

The surface of the main apron appears to be in rather good condition and strength of the main apron is reported to be PCN 25/R/A/X/T and the pavement structure is as follows:

- 33 cm cement concrete slab;
- 20 cm sand cement (upper sub-base);
- 40 cm sand/gravel (lower sub-base)

The surfacing of apron No.2 comprises a bituminous concrete pavement constructed in 1980. Strength of apron No.2 is reported to be PCN 21/F/A/X/T and the pavement structure is as follows:

- 18 cm bituminous concrete (surface and base course);
- 20 cm sand/gravel (sub-base course).

**(6) Drainage**

Open channel system is adopted as a rain water drainage system for the airfield facilities. It seems that the existing drainage is sufficient functionally because of the low precipitation of this area.

**3.13.4 Terminal Area Facilities (Bukhara)**

**(1) Modernization Project**

Modernization project in Bukhara airport includes the following building works:

- Construction of international passenger building
- Completion of existing half-constructed passenger terminal building
- Renovation of new cargo building
- Construction of control tower & operation building

**(2) Passenger Terminal Building**

The existing passenger terminal building is a small brick building of 1,100 m<sup>2</sup> large. This building is already aged and its space is not enough to handle current passenger volume.

Construction of a new terminal building of 8,400 m<sup>2</sup>-floor area was started with the airport's budget well before independence, but, the work has not progressed smoothly due to a lack of budget. NAC desired to complete the building by the Japanese fund, therefore, completion work was included in the Three Airports Modernization Project.

**(3) Control Tower and Operation Building**

The existing control tower and operation building, located at the center of the existing terminal area, was the former passenger building having a floor area of 1,320 m<sup>2</sup>.

**(4) Cargo Terminal Building**

The cargo handling facilities are located near the existing apron and compose of three buildings, which are of brick storage with an office, a storage of steel structure and wooden stage.

**(5) Administration Building**

The administration building is located next to the cargo handling facilities in the existing terminal area. It is of two stories brick structure and is approx. 790 m<sup>2</sup>.

(6) Utilities

Power is supplied by the city with two 10 kv lines. Water is supplied by the city through water main of 300 mm diameter. Hot water is supplied from the boiler plant in the airport. Natural gas is supplied for the boilers. Sewage from the airport is transferred to the city treatment plant through a sewage main of 219 mm diameter.

3.13.5 Air Navigation Facilities (Bukhara)

(1) Radio Nav aids and Telecommunication

Modernization project has been done by Japanese loan assistance since 1996 for the improvement of radio nav aids and radio telecommunication. Outline of existing radio nav aids and telecommunication facilities is as follows:

Table 3.13.2 Existing Radio Nav aids and Telecommunications (Bukhara)

| Equipment   | Manufacturer                                    | Date of Installation                 | Frequency (MHz)                           | Remarks                                  |
|---|---|--------------------------------------|---|--|
| 1. ILS<br>LLZ<br>GP<br>LMM<br>LOM   | Thomson   | 1997                                 | 110.3<br>335.0<br>0.795<br>0.39           | ID: IUIH<br>RWY 01                       |
| 2. ATC A/G<br>Airdrome<br>Approach<br>Local<br>Emergency<br>Standby         | Russia  | 1985                                 | 124.6<br>124.6<br>131.0<br>121.5<br>124.0 |  |
| 3. RADAR<br>ASR<br>SSR  | Russia  | 1984                                 | 800 band<br>1900 band                     | 150 kW<br>1.2 kW                         |
| 4. AFIN<br>MSS  | Russia  | 1982                                 |   | teletype                                 |
| 5. OTHERS<br>Tape recorder<br>VDF<br>HF<br>Radio Link<br>Inter City Network | Hungary<br>Russia<br>Russia<br>Russia<br>Russia | 1986<br>1986<br>1986<br>1985<br>1985 | 2000                                      | 16 ch<br>AMS, RITY<br>30 ch OM-<br>Tower |

(2) Airfield Lighting and Power Supply System

The modernization project has been done by Japanese loan assistance since 1996 for the improvement of airfield lighting facilities. Outline of existing airfield lighting facilities is as follows:

**Table 3.13.3 Existing Airfield Lighting Facilities (Bukhara)**

| Equipment                | Manufacturer | Date of Installation | Remarks  |
|--------------------------|--------------|----------------------|--|
| 1. Approach Light        | Czech        | 1980                 | RWY 01   |
| 2. Simple Approach Light | Czech        | 1980                 | RWY 19   |
| 3. Runway Edge Light     | Czech        | 1980                 |  |
| 4. Threshold Light       | Czech        | 1980                 |  |
| 5. Taxiway Edge Light    | Czech        | 1980                 |  |
| 6. Taxiing Guidance Sign | Czech        | 1980                 |  |
| 7. Taxiway Guard Light   | Czech        | 1980                 |  |
| 8. Turning Pad Light     | Czech        | 1980                 |  |
| 9. Engine Generator      | Poland       | 1980                 | TP 2, TP 3<br>3phase 3wires 400V,<br>150 kVAx2 |
| 10. Others               |              |                      |  |

**(3) Meteorological facilities**

The modernization project has been done by Japanese loan assistance since 1996 for the improvement of meteorological facilities. The outline of existing aeronautical meteorological facilities is as follows :

**Table 3.13.4 Existing Aeronautical Meteorological Facilities (Bukhara)**

| Equipment                             | Manufacturer | Date of Installation | Remarks                      |
|---------------------------------------|--------------|----------------------|------------------------------|
| 1. Windvane and Anemometer            | Russian      | 1986                 |                              |
| 2. Air and Dewpoint Temperature Meter | Russian      | 1986                 |                              |
| 3. Barometer                          | Russian      | 1986                 |                              |
| 4. Rain Gauge                         | Russian      | 1986                 |                              |
| 5. Ceilometer                         | Russian      | 1986                 |                              |
| 6. RVR Equipment                      | Russian      | 1992                 | transmission meter and panel |
| 7. Facsimile Recorder                 | Russian      | 1986                 |                              |
| 8. Weather Information System         | Russian      | 1986                 | VHF channel                  |
| 9. Others                             |              |                      |                              |

**3.14 Navoi Airport**

**3.14.1 General (Navoi)**

Navoi city, the capital of Navoi Province, has a population of 114 thousand and is located on the way to Bukhara from Samarkand. Navoi is a very young town, but a fast growing industrial town in Zarafshan Valley under the former Soviet Union. Major industries is exploitation of natural gas, chemical industries, non-ferrous metallurgy, and light and food industries.

The airport is located 25 km southwest of the city center in desert area. There are a few residence areas at the west side of the terminal area. The airport having a 1,410 m-long runway was opened in 1958, which is the most recent opened airport in Uzbekistan. After improvement work in 1979 and 1980, construction of a new terminal was carried out in 1986. Then, the runway extension work to 2,830 m long was being conducted up to 1991, but, its work is in suspension due to lack of budget.

### 3.14.2 Air Traffic Volume (Navoi)

The current air traffic volume of Navoi airport is as shown in Table 3.14.1. At present, there are two (2) daily flights between Tashkent with Yak-40, and number of departure passengers in 1996 was 11 thousand. Formerly, there were more than thirty-four flights per day between CIS countries as well as Tashkent, Samarkand and Uchkuduk.

Table 3.14.1 Air Traffic Volume (Navoi)

| Item  |       | 1990-1995 | 1996 |
|---|-------|-----------|------|
| Aircraft movements<br>(Take off and Landing)          | Int.  |           | 1    |
|   | CIS   |           | 1    |
|   | Dom.  | N.A.      | 572  |
|   | N.S   |           | 9    |
|   | Total |           | 583  |
| Passenger<br>(Dispatch and disembarkation)<br>(000)   | Int.  |           | 0.0  |
|   | CIS   | N.A.      | 0.0  |
|   | Dom.  |           | 11.1 |
|   | Total |           | 11.1 |
| Cargo (ton)<br>(Dispatch and disembarkation)<br>(ton) | Int.  |           |      |
|   | CIS   | N.A.      | N.A. |
|   | Dom.  |           |      |
|   | Total |           |      |

### 3.14.3 Airfield Facilities (Navoi)

#### (1) Aerodrome Geographical Data

- geographical coordinates N 40° 07';  
E 065° 12';
- aerodrome elevation 347 m;
- aerodrome reference temperature NA;
- magnetic variation 5°E

#### (2) Runway

The surfacing of the runway comprises a bituminous concrete pavement constructed in 1980 with dimensions of 1410 meters long and 45 meters wide. The surfacing of the runway was partially repaved (1250 meters from 07 threshold) with 4 cm thick bituminous concrete in 1994 and repaving of the remaining portion has been suspended due to a lack of finance.

In general, the surface of the repaved portion of the runway appears to be in rather good

condition, although longitudinal and transverse cracks were observed during the site inspections. However, the surface of the remaining portion of the runway appears to be in poor condition and the following defects were observed during the site inspection:

- large cracks in the longitudinal and transverse directions;
- alligator cracks;
- raveling and weathering.

Strength of the runway is reported to be PCN 7/F/B/Y/T and the pavement structures are as follows:

a) Repaved portion

- 12 cm bituminous concrete (surface and base course);
- 14 cm gravel (sub base course);
- Subgrade silt

b) Remaining portion

- 8 cm bituminous concrete (surface and base course);
- 14 cm gravel (sub-base course);
- Subgrade silt

The mean longitudinal slope of the runway is 0.21% according to AIP information. The runway was planned to be extended with dimensions of 1,420 meters long and 45 meters wide to the west of the existing runway and constructed partially by precast reinforced concrete in 1994. However, due to the lack of budget, the extension of the runway has been suspended. The pavement structure of the extended portion is as follows:

- 14 cm precast reinforced concrete slab;
- 20 cm concrete slab;
- Sub-base sand/gravel
- Subgrade silt

(3) Taxiway

The taxiway system consists of two exit taxiways. The surfacing of the west taxiway, as the main taxiway comprises a bituminous concrete pavement constructed in 1980.

Width of the main taxiway is reported to be 18 meters. In general, the surface of the main taxiway appears to be in poor condition and exhibits the same defects as the runway, with widespread random and block pattern cracks being particularly extensive.

Strength of the main taxiways is reported to be PCN 8/F/B/Y/T and the pavement structure is as follows:

- 8 cm bituminous concrete (surface and base course);
- 14 cm gravel (sub-base course);
- Subgrade silt

The surfacing of the east taxiway comprises a bituminous concrete pavement, constructed 1980. Width of the taxiway is reported to be 9 meters to facilitate AN-2 aircraft.

In general, the surface of the east taxiway appears to be in a poor condition and exhibits the same defects as the main taxiway, although the extent of the damage is worse, and the east taxiway is closed at the present time. The parallel taxiway and west exit taxiway were constructed by precast reinforced concrete in 1994. However, due to the runway extension being incomplete the taxiways are closed at the present time.

The pavement structure of the taxiways are the same as the extended portion of the runway.

**(4) Apron**

The apron system consists of two aprons, and the main apron is located in the terminal area and the other situated on the east of the main apron for light aircraft, such as the AN-2.

The surfacing of the main apron comprises a bituminous concrete pavement constructed in 1980. There are four (4) aircraft positions for YaK-40 and AN-24. In general, the surface of the main apron appears to be in poor condition and exhibits the same defects as the main taxiway. Strength of the main apron is reported to be PCN 11/F/B/Y/T and the pavement structure is as follows:

- 8 cm bituminous concrete (surface and base course);
- 14 cm gravel (sub-base course);
- Subgradesilt

The surfacing of the east apron comprises a bituminous concrete pavement constructed in 1980. There are six aircraft positions for AN-2. In general, the surface of the east apron appears to be in poor condition and exhibits the same defects as the east taxiway, and the east apron is closed at the present time.

The main apron was planned to be expanded to the east of the existing apron and partially constructed by precast reinforced concrete in 1994. However, because of only partial completion of the expansion, the expanded apron is closed at the present time.

**(5) Drainage**

There is a large open ditch on the south of the runway along with the boundary of the airport. No other drainage system is adopted as a rain water drainage system for the airfield facilities.

**3.14.4 Terminal Area Facilities (Navoi)**

**(1) Passenger Terminal Building**

Terminal area is located near the east end of the runway. The number of facilities in the terminal area is rather less compared with other airport, and its layout is in good.

The terminal building located at the center of the terminal area was constructed of reinforcement concrete structure of 2 stories, and its floor area is 4,000 m<sup>2</sup>. There is enough space for expansion to the east side of the building. There are no arrival facilities.

**(2) Cargo Terminal Building**

There are no facilities for cargo handling. Presently, there is little demand for cargo.

**(3) Control Tower and Operation Building**

The control tower and operation building is located to the west side of the passenger terminal building. It was constructed of reinforcement concrete structure in 1986.

(4) Administration Building

The administration building is located 100 m east of the passenger terminal building. There is a small space for VIP handling provided in the building. There is no independent VIP building as commonly seen in other airports.

(5) Fire Station

The fire station is located at the east side of the terminal building with two (2) parking space for fire pump.

(6) Other Buildings

Storage house and fuel tank farm is also laid in the terminal area. Between the administration building and fuel tank farm, a military area is provided.

(7) Utilities

Electric power is supplied from the city with 10 kv-2 lines. Water is from a well in the terminal area. Hot water and gas is not provided. Number of telephone lines are 25 lines.

3.14.5 Air Navigation Facilities (Navoi)

(1) Radio Nav aids and Telecommunication

Existing equipment for radio nav aids and air traffic control facilities were installed more than 10 years ago, and there's a problem of shortages of spare parts. A part of radio telecommunication equipment was manufactured more than 15 years ago, but the operational function is in normal condition. The Traffic Radar (ARSR) was installed 2 km from the east side of the airport and has performed auxiliary functions of the Tashkent Area Control Center (ACC). The outline of existing radio nav aids and telecommunication facilities is shown below:

Table 3.14.2 Existing Nav aids and Telecommunication (Navoi)

| Equipment   | Manufacturer                                    | Date of Installation                 | Frequency (MHz)         | Remarks                                  |
|---|---|--------------------------------------|-------------------------|--|
| 1. NAV AIDS<br>LOM<br>LMM   | Russia  | 1985<br>1990                         | 1.030<br>0.508          | 2 sets                                   |
| 2. ATC A/G<br>Airdrome<br>ACC<br>Emergency                                  | Russia  | 1987                                 | 131.0<br>133.3<br>121.5 |  |
| 3. RADAR<br>En-route  | Russia  | 1987                                 | 3000 band               | 700 kW                                   |
| 4. AFTN   | Russia  | 1987                                 |                         | Teletype                                 |
| 5. OTHERS<br>Tape recorder<br>VDF<br>HF<br>Radio Link<br>Inter City Network | Hungary<br>Russia<br>Russia<br>Russia<br>Russia | 1987<br>1987<br>1991<br>1991<br>1987 | <br><br><br>2000        | 16 ch<br>AMS, RTTY<br>30 ch OM-<br>Tower |
| 6. Engine Generator   | Russia  | 1989                                 |                         | 3 phase 3 wires<br>400 V<br>200 kVA      |



(2) Airfield Lighting

There were no airfield lighting facilities installed at the airport. There were obstruction lights and security lights on the apron.

(3) Meteorological Facilities

Meteorological observation system is provided in accordance with ICAO standards. The current weather and trend forecast information is given to each air traffic control section, and also Navoi airport meteorological division plays a role as a weather observation center for Navoi Province. The outline of existing aeronautical meteorological facilities is as follows:

**Table 3.14.3 Existing Aeronautical Meteorological Facilities (Navoi)**

| Equipment                             | Manufacturer | Date of Installation | Remarks    |
|---------------------------------------|--------------|----------------------|------------|
| 1. Windvane and Anemometer            | Russian      | 1986                 |            |
| 2. Air and Dewpoint Temperature Meter | Russian      | 1986                 |            |
| 3. Barometer                          | Russian      | 1986                 |            |
| 4. Rain Gauge                         | Russian      | 1986                 |            |
| 5. Ceilometer                         | Russian      | 1986                 |            |
| 6. RVR Equipment                      | Russian      | 1986                 | Panel type |
| 7. Others                             |              |                      |            |

(4) Power Supply System

The condition of power supply for each individual facility is good, but the power supply equipment was manufactured more than 20 years ago. Back-up engine generators were installed for each individual facility.

**3.15 Urgench Airport**

**3.15.1 General (Urgench)**

Urgench, the capital of Khorezm Province, has a population of 138 thousand. Khiva, one of the historical tourism centers of the Islamic religion and Silk Route's Oasis cities is located 33 km southwest of Urgench. Major industries in Urgench are cotton cultivation and processing, oil factory, light and food industries and building materials.

Urgench airport is located about 5 km east of the city center. In 1929, the airport was started as a supply base airfield. During 1967 to 1979, the airport facilities were constructed each by each including runway and terminal building. Presently, the airport has a 3,000 m-long runway and is being served for CIS and domestic flights.

**3.15.2 Air Traffic Volume (Urgench)**

Current air traffic of Urgench airport is as shown in Table 3.15.1. At present, there are scheduled flights between Domodedovo (Moscow) via Namangan and Tashkent. For the past three years, departure passengers have slightly increased.

Table 3.15.1 Air Traffic Volume (Urgench)

| Item  |       | 1990    | 1991  | 1992  | 1993  | 1994  | 1995  | 1996  |
|---|-------|---------|-------|-------|-------|-------|-------|-------|
| Aircraft<br>movements<br>(Take off<br>and<br>Landing) | Int.  |         |       |       |       |       |       |       |
|   | CIS   |         |       |       |       |       |       |       |
|   | Dom.  |         |       |       |       |       |       |       |
|   | N.A   |         |       |       |       |       |       |       |
|   | Total | N.A.    | N.A.  | N.A.  | 3,054 | 2,555 | 3,954 | 2,834 |
| Passenger<br>(Dispatch)<br>(000)                      | Int.  |         |       |       |       |       |       |       |
|   | CIS   |         |       |       |       |       |       |       |
|   | Dom.  |         |       |       |       |       |       |       |
|   | Total | 263.2   | 232.5 | 108.0 | 48.7  | 59.9  | 68.5  | *     |
| Cargo<br>(Dispatch )<br>(ton)                         | Int.  |         |       |       |       |       |       |       |
|   | CIS   |         |       |       |       |       |       |       |
|   | Dom.  |         |       |       |       |       |       |       |
|   | Total | 1,154.9 | 763.6 | 243.9 | 80.8  | 252.2 | 133.6 | *     |

### 3.15.3 Airfield Facilities (Urgench)

#### (1) Modernization Project

Modernization of the Urgench airport started as one of the airports under the Three Local Airports Modernization Project in 1996 with the financial assistance from the Overseas Economic Cooperation Fund of Japan. The main objectives of the Project is to modernize the existing three local airports, namely Samarkand Airport, Bukhara Airport and Urgench Airport, as international gateways in order to encourage the economic development of Uzbekistan.

The project is planned to be implemented in two stages and the implementation work of the first stage is now being conducted. The Project is anticipated to be completed at the end of 1999.

Regarding the airfield facilities in Urgench airport, the existing runway, taxiway and apron are physically getting old and outdated today. Furthermore, due to the recent introduction of international flight services, the runway, taxiway and apron are showing inadequacy in accordance with ICAO standards.

Improvement plans for airfield facilities in the modernization project at Urgench airport includes the following improvement plans;

- Bituminous overlay of the existing runway, taxiway and apron
- Construction of runway shoulders;
- Widening of the existing taxiways;

#### (2) Aerodrome Geographical Data

- geographical coordinates                             N 41° 34' 30''  
   E 060° 38' 30''
- aerodrome elevation                                   97 meters

- aerodrome reference temperature      NA
- magnetic variation                      5° E (1994)

(3) Runway

The surfacing of the runway comprises a bituminous concrete pavement constructed in 1966 with dimensions of 3,000 meters long and 44 meters wide. Strength of the runway is reported to be PCN 38~57/F/B/W/T and is expected to be PCN 46~57/ F/B/W/T after reinforcement.

The pavement structure is as follows:

- a) Existing portion
  - 37~51 cm bituminous concrete (surface and base course);
  - 30~40 cm gravel (sub-base course);
- b) Improved portion
  - 9 cm bituminous concrete overlay (surface and base course)
  - 27 cm bituminous concrete
  - 40 cm gravel (sub-base course).

The mean longitudinal slope of the runway is 0.0% according to AIP information.

(4) Taxiway

The taxiway system consists of three exit taxiways and one parallel taxiway and No.1 exit taxiway is utilized as a main exit taxiway. The surfacing of the taxiways comprises a bituminous concrete pavement constructed in 1966.

Strength of the existing taxiways are reported to be as follows:

- No.1 exit taxiway      PCN 38/F/B/X/T
- No.2 exit taxiway      PCN 16/F/C/X/T
- No.3 exit taxiway      PCN 16/F/C/X/T
- Parallel taxiway      PCN 38/F/B/W/T

Strength of the main exit taxiway is expected to be PCN 47/F/B/W/T after reinforcement.

The pavement structures of the existing taxiways are as follows:

- a) No.1, No.2 exit taxiway and parallel taxiway
  - 27 cm bituminous concrete (surface and base concrete)
  - 40 cm gravel (sub-base course)
- b) No.3 exit taxiway
  - 9 cm bituminous concrete (surface and base course)
  - 40 cm gravel (sub-base course)

The improved pavement structure of the main exit taxiway will be as follows:

- 9 cm bituminous concrete overlay (surface and base course)
- 27 cm bituminous concrete

- 40 cm gravel (sub-base course).

The widths of the existing taxiways are 21 meters and the width of the main exit taxiway is expected to be 23 meters category with ICAO standards.

**(5) Apron**

The apron system consists of two aprons and the No. 1 apron is used for scheduled flights as a main apron. The surfacing of the apron comprises a bituminous concrete pavement constructed in 1966.

Strength of the existing aprons is reported to be PCN 38/F/B/W/T and the strength of the improved portion of the main apron is expected to be PCN 47/F/B/W/T.

The pavement structures are as follows:

**a) Existing portion**

- 27 cm bituminous concrete (surface and base course)
- 40 cm gravel (sub-base course)

**b) Improved portion**

- 9 cm bituminous concrete overlay (surface and base course)
- 27 cm bituminous concrete
- 40 cm gravel (sub-base course);

**(6) Drainage**

Underground piping system is adopted as a rain water drainage system for the airfield facilities. Collected water is lead to the open channel through pipe culverts and then discharged into the river located along the airport boundary. The existing system seems to be maintained in good condition.

**3.15.4 Terminal Area Facilities (Urgench)**

**(1) Modernization Project**

Modernization project in Urgench airport includes the following building works;

- Expansion and renovation of existing passenger terminal building
- Construction of international passenger terminal building
- Construction of new control tower and operation building
- Construction of new cargo building

**(2) Passenger Terminal Building**

The terminal area is located along the road parallel to the runway is approx. 1,200 m long, composing of three blocks, passenger and cargo handling, airport administration, and aircraft maintenance, respectively.

In the passenger and cargo handling block, at the western part of the terminal area, passenger building, cargo storage, air traffic control tower and other facilities are located.

In the central area is the airport administration block, administration building, fire station, building for pilots and some aircraft maintenance facilities are located.

The eastern part is aircraft maintenance block, aircraft maintenance hangers, workshops,

garages and related facilities are located.

Existing passenger terminal building has a floor area of 3,420 m<sup>2</sup> with 2 stories of reinforcement concrete structure. This building was constructed as a domestic terminal building during the Soviet Union era. Therefore, for handling international flights or more passenger traffic, there are the following problems;

- no passenger guidance
- poor baggage handling devices
- mixture of international and domestic passengers
- no customs inspection
- no toilet available in the lounges and main lobby
- no security inspection on check-in baggage
- poor facility for arrival passengers

After careful study on various alternative methods to solve the above situation, NAC decided to construct new a international passenger building, and its implementation is being executed as one of the works under the Three Local Airports Modernization Project.

(3) Cargo Terminal Building

Cargo handling facilities are located between the passenger terminal building and the control tower. It was the former passenger terminal building.

(4) Control Tower and Operation Building

The control tower is located to the east of the passenger terminal building, of which the structure is reinforced concrete with 3 stories and of 570 m<sup>2</sup> including operation building of 1 story.

(5) Fire Station

The fire station is located at the center of the terminal area. It has three (3) bays for fire fighting vehicles and other related facilities. The total floor area is 410 m<sup>2</sup>.

(6) Administration Building

The administration building is located at the center of the terminal area. It has a floor area of approx. 265 m<sup>2</sup> of one story brick structure.

(7) Other Buildings

There is a boiler plant, aircraft maintenance hangars, VIP building, fuel tank farm and so on other than the above mentioned facilities.

(8) Access Road and Car Parking

The access road for the terminal area directly connected to Urgench city is composed of two lanes in each direction and is 25 m wide. Car parking for the passenger terminal building is located along the circulation road in front of and beside the building, and its capacity is assumed to be 80 lots.

(9) Utilities

Electric power is supplied by the city with two (2) 10 kv lines. Water is also supplied by the city through a water main of 150 mm diameter. Natural gas is supplied by the city to the

passenger terminal building and the boiler plant. Hot water is supplied for heating of buildings. Sewage is treated by the city through a sewage main of 150 mm diameter.

### 3.15.5 Air Navigation Facilities (Urgench)

#### (1) Radio Nav aids and Telecommunication

The modernization project has been done by Japanese loan assistance since 1996 for the improvement of radio nav aids and radio telecommunication. The outline of existing radio nav aids and radio telecommunication facilities is as follows:

**Table 3.15.2 Existing Radio Nav aids and Telecommunication (Urgench)**

| Equipment  | Manufacturer                                    | Date of Installation                 | Frequency (MHz)                  | Remarks           |
|--|---|--------------------------------------|----------------------------------|-------------------|
| 1. ILS<br>ILZ<br>GP<br>LMM<br>LOM  | Thomson   | 1997                                 | 111.7<br>333.5<br>0.983<br>0.485 | ID: RMY<br>RWY 31 |
| 2. ATC A/G<br>Airdrome<br>Approach<br>Emergency<br>Standby                   | Russia  | 1990                                 | 118.3<br>126.0<br>121.5<br>124.0 |                   |
| 3. RADAR<br>ASR<br>SSR   | Russia  | 1984                                 | 800 band<br>1000 band            |                   |
| 4. AFIN<br>MSS   | Russia  | 1982                                 |                                  | teletype          |
| 5. OTHERS<br>Tape recorder<br>VDF<br>IBF<br>Radio Link<br>Inter City Network | Hungary<br>Russia<br>Russia<br>Russia<br>Russia | 1986<br>1986<br>1986<br>1980<br>1986 |                                  | 16 ch             |

#### (2) Airfield Lighting and Power Supply System (Urgench)

The modernization project has been done by Japanese loan assistance since 1996 for the improvement of airfield lighting facilities. The outline of existing airfield lighting facilities is as follows:

**Table 3.15.3 Existing Airfield Lighting Facilities (Urgench)**

| Equipment                | Manufacturer | Date of Installation | Remarks                                      |
|--------------------------|--------------|----------------------|--|
| 1. Approach Light        | TESLA        | 1987                 | RWY 31                                       |
| 2. Simple Approach Light | TESLA        | 1987                 | RWY 13                                       |
| 3. Runway Edge Light     | TESLA        | 1987                 |  |
| 4. Threshold Light       | TESLA        | 1987                 |  |
| 5. Taxiway Edge Light    | TESLA        | 1987                 |  |
| 6. Taxiing Guidance Sign | TESLA        | 1987                 |  |
| 7. Turning Pad Light     | TESLA        | 1987                 |  |
| 8. Apron Flood Light     | USSR         | 1983                 |  |
| 9. Engine Generator      | USSR         | 1980                 | 3 phase 3 wires 400 V<br>50 kVAx1, 100 kVAx1 |
| 10. Others               |              |                      |  |

**(3) Meteorological Facilities**

The modernization project has been done by Japanese loan assistance since 1996 for the improvement of the meteorological facilities. The outline of existing aeronautical meteorological facilities is as follows:

**Table 3.15.4 Existing Aeronautical Meteorological Facilities (Urgench)**

| Equipment                             | Manufacturer | Date of Installation | Remarks     |
|---------------------------------------|--------------|----------------------|-------------|
| 1. Windvane and Anemometer            | Russian      | 1986                 |             |
| 2. Air and Dewpoint Temperature Meter | Russian      | 1986                 |             |
| 3. Barometer                          | Russian      | 1986                 |             |
| 4. Rain Gauge                         | Russian      | 1986                 |             |
| 5. Ceilometer                         | Russian      | 1986                 |             |
| 6. RVR Equipment                      | Russian      | 1986                 | Panel type  |
| 7. Facsimile Recorder                 | Russian      | 1986                 |             |
| 8. Weather Information System         | Russian      | 1986                 | VHF channel |
| 9. Others                             |              |                      |             |

**3.16 Nukus Airport**

**3.16.1 General (Nukus)**

Nukus is the capital of Republic of Karakalpakstan, which has a population of about 1.4 million. Major industries in Nukus are agri-products of cotton processing and rice, textile and small machine manufacture and repair.

The Nukes airport is located 7 km north-west of the city and has a 3,000 m-long runway. The area around the airport is mainly flat glass land, but a small part is occupied are residence area around the airport.

In around 1934, the airport was initiated as a small aircraft airfield. In 1960, substantial expansion work was made and the existing runway was constructed in 1980. The administration building was completed in 1952, control tower in 1967, passenger terminal building in 1970 and cargo terminal building in 1976.

### 3.16.2 Air Traffic Volume (Nukus)

The current air traffic volume is as shown in Table 3.16.1. At present, there are two (2) daily flights between Tashkent with Tu-154 or Yak-40, and one (1) weekly flight between Moscow. Passenger traffic in 1996 was 5 thousand for CIS routes and 55 thousand for domestic flights. Total passengers in 1996 decreased to about 20 % of the total passenger load of 330 thousand in 1991, but, since 1994, total passengers have increased at the growth rate of 15%.

Table 3.16.1 Air Traffic Volume (Nukus)

| Item   |      | 1990   | 1991   | 1992  | 1993  | 1994  | 1995  | 1996  | 96/95 | 96/91 |
|--|------|--------|--------|-------|-------|-------|-------|-------|-------|-------|
| Aircraft<br>movements<br>(Take off<br>and Landing) | Int. | -      | -      | -     | -     | -     | -     | -     |       |       |
|  | CIS  | 9,892  | 8,024  | 1,682 | 578   | 984   | 906   | 540   | 0.60  | 0.07  |
|  | Dom. | 36,212 | 14,328 | 6,728 | 3,958 | 3,326 | 4,084 | 3,656 | 0.90  | 0.26  |
|  | N.A  | 764    | 694    | 616   | 506   | 498   | 448   | 392   | 0.88  | 0.56  |
| Total  |      | 46,868 | 23,046 | 9,026 | 5,042 | 4,808 | 5,438 | 4,588 | 0.84  | 0.20  |
| Passenger<br>(Dispatch)<br>(000)                   | Int. | -      | -      | -     | -     | -     | -     | -     |       |       |
|  | CIS  | 70     | 65     | 15    | 7     | 6     | 7     | 5     | 0.71  | 0.08  |
|  | Dom. | 280    | 265    | 115   | 43    | 39    | 43    | 55    | 1.28  | 0.21  |
| Total  |      | 350    | 330    | 130   | 50    | 45    | 50    | 60    | 1.20  | 0.18  |
| Cargo<br>(Dispatch)<br>(ton)                       | Int. | -      | -      | -     | -     | -     | -     | -     |       |       |
|  | CIS  | 750    | 350    | 115   | 10    | 20    | 8     | 6     | 0.75  | 0.02  |
|  | Dom. | 1,850  | 760    | 305   | 40    | 55    | 27    | 17    | 0.63  | 0.02  |
| Total  |      | 2,600  | 1,110  | 420   | 50    | 75    | 35    | 23    | 0.66  | 0.02  |

### 3.16.3 Airfield Facilities (Nukus)

#### (1) Aerodrome Geographical Data

- geographical coordinates N 42° 29' 18''  
E 059° 37' 24''
- aerodrome elevation 76 meters
- aerodrome reference temperature NA
- magnetic variation 5°E (1994)

#### (2) Runway

The surfacing of the runway comprises a precast reinforced concrete pavement constructed in 1980 with dimensions of 3000 meters long and 48 meters wide. In general, the surface of the runway appears to be in poor condition and the following defects were observed during the site inspection:

- longitudinal, transverse and diagonal cracks;
- corner breaks;
- joint-seal damages;
- scaling;
- spalling;
- patching.



Strength of the runway is reported to be PCN 20/R/A/X/T and the pavement structure is as follows:

- 18 cm precast reinforced concrete slab;
- 5 cm sand cement leveling course;
- 10 cm crusher run (upper sub-base);
- 50 cm gravel (lower sub-base)
- Subgrade sandy silt

The mean longitudinal slope of the runway is 0.03% according to AIP information.

### (3) Taxiway

The taxiway system consists of three exit taxiways, one parallel taxiway and three connection taxiways. The surfacing of the taxiways comprises a bituminous concrete pavement constructed in 1980. The widths of the taxiways are as follows:

- No.1 exit taxiway 38 meters
- No.2 exit taxiway 22 meters
- No.3 exit taxiway 22 meters
- No.4 connection taxiway 40 meters
- No.5 parallel taxiway 45 meters
- No.6 connection taxiway 16 meters
- No.7 connection taxiway 18 meters.

In general, the surface of the taxiways appears to be in poor condition and the following defects were observed during the site inspection:

- longitudinal and transverse cracking;
- alligator cracking;
- block cracking;
- raveling and weathering;
- rutting;
- depressions;
- patching.

Strengths of the taxiway are reported as follows:

- No.1 exit taxiway PCN 42/F/B/X/T
- No.2 exit taxiway PCN 42/F/B/X/T
- No.3 exit taxiway PCN 42/F/B/X/T
- No.4 connection taxiway PCN 35/F/B/X/T
- No.5 parallel taxiway PCN 26/F/B/X/T
- No.6 connection taxiway (65 T)

- No.7 connection taxiway (65 T)

The pavement structures of the taxiway are as follows:

a) No.1 taxiway ~ No.3 taxiway

- 18 cm bituminous concrete (surface and base course);
- 10 cm crusher run (upper sub-base course);
- 50 cm sand/gravel (lower sub-base course)
- Subgrade sandy silt

b) No. 4 taxiway

- 32 cm bituminous concrete (surface and base course);
- 22 cm crusher run (sub base course);
- Subgrade sandy silt

c) No. 5 taxiway

- 31 cm bituminous concrete (surface and base course);
- 22 cm crusher run (sub-base course);
- Subgrade sandy silt

d) No.6 and No.7 taxiway

- 6 cm bituminous concrete (surface course);
- 15 cm crusher run (sub-base course);
- Subgrade sandy silt

(4) Apron

The surfacing of the apron comprises a bituminous concrete pavement constructed in 1980. There are eight aircraft positions, of which two (2) positions are for TU-154, one (1) position for IL-62 and five (5) positions for YaK-40 and AN-24.

In general, the surface of the apron appears to be in a poor condition and exhibits the same defects as the taxiways.

Strength of the apron is reported to be PCN 35/F/B/X/T and the pavement structure is as follows:

- 30 cm bituminous concrete (surface and base course);
- 10 cm crusher run (upper sub-base course);
- 40 cm sand/gravel (lower sub-base course);
- Subgrade sandy silt

No.5 parallel taxiway is occasionally used as temporary aircraft positions for IL-86 and other aircraft and at present, No.7 connection taxiway is used as aircraft positions for AN-2.

(5) Drainage

No drainage system is adopted as a rain water drainage system for the airfield facilities.

### **3.16.4 Terminal Area Facilities (Nukus)**

#### **(1) Passenger Terminal Building**

The terminal area is located at the center part to the runway. Buildings in the terminal area are arranged along the access road passing parallel to the runway. The passenger terminal building constructed in 1969 is situated at the southern part of the terminal area. The building is the oldest in the twelve (12) airports, and has a floor area of 2,200 m<sup>2</sup> large of two stories with a capacity of 200 passengers per hour.

In the building, lobby, check-in booth, offices, snack, post office, shop and first aid are located on the first floor, and office and operation rooms on the second floor.

The existing building has passed for about 30 years, and its condition is superannuated. Construction of a new passenger terminal building started at the north side of the existing terminal building before independence, but, actual work executed was only excavation for foundations, then the work was suspended due to lack of budget.

#### **(2) Cargo Terminal Building**

The cargo terminal building is located to the north of the passenger terminal building.

#### **(3) Administration Building**

The administration building is situated at the north side of the cargo terminal building. There are some other buildings for administration staff around the administration building. All buildings are superannuated, so a new administration building with five stories is presently under construction.

#### **(4) Fire Station**

The fire station is located at the north side of the control tower.

#### **(5) Other Building**

VIP building, garage, maintenance facilities for An-2, fuel tank farm are also provided in the terminal area. Military facilities are located on the opposite side of the terminal area of the runway.

#### **(6) Control Tower and Operation Building**

The control tower and operation building are located between Taxiways No. 5 and No.7. Space for the operation rooms are provided in the terminal building.

### **3.16.5 Air Navigation Facilities (Nukus)**

#### **(1) Radio Navaids and Telecommunication**

Existing equipment for radio navaids and air traffic control facilities were installed more than 10 years ago, and most of the radio telecommunication equipment was manufactured more than 15 years ago. There is a problem of shortages of spare parts, but the operational functions are in normal condition. Traffic Radar (ARSR) was installed at the airport and has performed the function of Nukus Area Control Center (ACC). The outline of existing radio navaids and radio telecommunication facilities is as follows:

**Table 3.16.2 Existing Radio Nav aids and Telecommunication (Nukus)**

| Equipment   | Manufacturer                                    | Date of Installation                 | Frequency (MHz)                                    | Remarks                            |
|---|---|--------------------------------------|--|------------------------------------|
| 1. ILS<br>ILZ<br>GP<br>LMM<br>LOM   | Russia  | 1988                                 | 110.3<br>335.0<br>0.888<br>0.435                   | RWY 33                             |
| 2. ATC<br>Airdrome<br>Circle<br>Approach<br>Starter<br>ACC (lower)<br>ACC (upper)   | Russia  | 1979-90                              | 121.3<br>121.3<br>125.5<br>120.0<br>129.3<br>132.2 |                                    |
| 3. RADAR<br>ASR<br>SSR<br>En-route  | Russia  | 1986<br>1986<br>1989                 | 800 band<br>1000 band<br>3000 band                 | 115 kW<br>1.2 kW<br>700 kW         |
| 4. AFIN<br>MSS  | Russia  | 1982                                 |  | teletype                           |
| 5. OTHERS<br>RSBN<br>Tape recorder<br>VDF<br>HF<br>Radio Link<br>Inter City Network | Russia<br>Hungary<br>Russia<br>Russia<br>Russia | 1981<br>1986<br>1986<br>1986<br>1986 | 900 band   | NAV system<br>16 ch<br>point-point |

**(2) Airfield Lighting and Power Supply System**

The airfield lighting system was installed 17 years ago, and there is a problem of shortages of spare parts, but the operational functions are in normal condition. The condition of power supply for each individual facility is good. Back-up engine generators were installed for each individual facility. The outline of existing airfield lighting facilities is as follows:

**Table 3.16.3 Existing Airfield Lighting Facilities (Nukus)**

| Equipment                | Manufacturer | Date of Installation | Remarks   |
|--------------------------|--------------|----------------------|---|
| 1. Approach Light        | Russia       | 1980                 | RWY 33  |
| 2. Simple Approach Light | Russia       | 1980                 | RWY 15  |
| 3. Runway Edge Light     | Russia       | 1980                 |   |
| 4. Threshold Light       | Russia       | 1980                 |   |
| 5. Taxiway Edge Light    | Russia       | 1980                 |   |
| 6. Taxiing Guidance Sign | Russia       | 1980                 |   |
| 7. Turning Pad Light     | Russia       | 1980                 |   |
| 8. Apron Light           | Russia       | 1980                 |   |
| 9. Engine Generator      | Russia       | 1980                 | AFL : 3 phase 3 wires<br>400V, 200 kWx1<br>KDP : 3 phase 3 wires<br>400V 100 kWx1 |
| 10. Others               |              |                      |   |

**(3) Meteorological Facilities (Nukus)**

The weather observation yard is located at the starter control position. The meteorological observation system is provided in accordance with ICAO standards. The current weather and trend forecast information is given to each air traffic control section, and also Nukus

airport meteorological division plays a role as a weather observation center for Karakalpakstan Autonomous Republic. Outline of existing aeronautical meteorological facilities is as follows:

**Table 3.16.4 Existing Aeronautical Meteorological Facilities (Nukus)**

| Equipment                             | Manufacturer | Date of Installation | Remarks                      |
|---------------------------------------|--------------|----------------------|------------------------------|
| 1. Windvane and Anemometer            | Russian      | 1986                 |                              |
| 2. Air and Dewpoint Temperature Meter | Russian      | 1986                 |                              |
| 3. Barometer                          | Russian      | 1986                 |                              |
| 4. Rain Gauge                         | Russian      | 1986                 |                              |
| 5. Ceilometer                         | Russian      | 1986                 |                              |
| 6. RVR Equipment                      | Russian      | 1990                 | Transmission meter and panel |
| 7. Facsimile Recorder                 | Russian      | 1986                 |                              |
| 8. Weather Telegraph                  | Russian      | 1986                 |                              |
| 9. Weather Information System         | Russian      | 1986                 | VHF channel                  |
| 10. Others                            | Russian      | 1986                 |                              |

### **3.17 New Tashkent Airport Project**

#### **3.17.1 Historical Background**

Removal of the existing Tashkent Airport has been debated and studied by the then civil aviation organization since the 1980s. In the former Soviet Union era, the Tashkent Airport had acted as one of the international gateways within the former Soviet Union.

However, it was pointed out that its location, only about 5 km from Tashkent city has hampered not only development of the airport, but also expansion plans to Tashkent city, furthermore, such environmental impact as aircraft noise pollution and radiation by radio nav aids and other equipment has caused damages to the habitants around the airport.

By Decree No.114 dated April 30, 1991, removal of the existing Tashkent Airport by 2000 was authorized. Resolution of the Cabinet of Ministers No.68-F dated March 2,1992, an ad-hoc committee was organized in order to select the best site for the new airport construction. The committee studied and selected three (3) sites from eight (8) possible sites paying attention to minimal alienation of the irrigated area, possibilities of simultaneous operation of both the new airport and the existing airport until the completion of the new airport and minimal disturbances of cities by aircraft noise.

After comparative evaluation among the three sites, a site situated 45 km from Tashkent cities and 12 km from Chinaz in the region of Chinaz occupied by the Sovkhoses, Yanguyabad and Ishanabad, was recommended by the Committee to the Cabinet of Ministers for approval.

By the Resolution of the Cabinet of Ministers, No.345 dated July 24, 1992, the said site was approved with authorization to realizing a feasibility study for the new airport and removal of the existing airport through NAC as an executing agency.

In 1993, three feasibility studies for the new airport project were conducted by distinct groups. At first, a feasibility study for construction of a new international airport at the abovementioned site was carried out by the Kazairproject in Kazakhstan. Secondly, a feasibility study was conducted by a group of SOFINERA and Aeroports de Paris (ADP). Thirdly, a complex feasibility study was carried out by a group headed by Institute "TashNliGenplan".

Thereafter, the site firstly selected for a new airport was canceled due to its close location on the border with Kazakhstan. Site selection was newly made and a site near Almazar village in Chinaz between State Road M-39 and Railway lines was selected.

#### **3.17.2 Outlined Scope of the Project**

##### **(1) Demand Forecast**

According to the Study reports prepared by "TashNliGenplan", demand forecast of air traffic for the New Tashkent Airport was made by a group of Scientific & Technical Office "Transit" and Scientific Institute of Civil Aviation in Moscow, based on the traffic tendencies during 20 years from 1970 to 1991, and its results is as follows;

**Table 3.17.1 Demand Forecast for New Tashkent Airport Project**

| Type of Traffic                            | 2005        | 2010         | 2015         |
|--|-------------|--------------|--------------|
| <b>A. Passengers in million</b>            |             |              |              |
| Domestic Lines                             | 1.25        | 2.90         | 3.25         |
| International & CIS Lines                  | 3.75        | 8.60         | 9.75         |
| <b>Total</b>                               | <b>5.00</b> | <b>11.50</b> | <b>13.00</b> |
| <b>B. Cargo in thousand tons</b>           |             |              |              |
| Domestic Lines                             | 1.8         | 1.8          | 2.2          |
| International & CIS Lines                  | 68.2        | 80.2         | 91.8         |
| <b>Total</b>                               | <b>70.0</b> | <b>82.0</b>  | <b>94.0</b>  |
| <b>C. Mail in thousand tons</b>            |             |              |              |
| Domestic Lines                             | 38.2        | 43.5         | 46.8         |
| International & CIS Lines                  | 7.8         | 8.5          | 9.2          |
| <b>Total</b>                               | <b>46.0</b> | <b>52.0</b>  | <b>56.0</b>  |
| <b>D. Take-off and Landing in thousand</b> | <b>30.9</b> | <b>69.8</b>  | <b>78.7</b>  |

Regarding the fleet to be operated, it was planned that domestic flight services should be served by Yak-42, Tu-334, IL-114 and L-610, for international flights services by DMS-IL-96, B-747, A340-200, DMS-Yak-42 and Tu-334 and for freight by IL-76, An-70 and An-72.

(2) Scope of the Project

Major facilities of the Project was planned with the following requirements;

- **Runway** Two runways of 4,730 m and 4,300 m long with cement concrete pavement
- **Terminal Building** For the year 2005 target 49,360 m<sup>2</sup>  
For the year 2015 target 57,598 m<sup>2</sup>
- **Cargo Building** International 2005 600 tons capacity  
2015 1,200 tons capacity  
Domestic 2005 100 tons capacity
- **Nav aids and ATC Facilities** ILS, ASR/SSR, Airfield Lighting, Met. Facilities, ATC Facilities, and Tower
- **Aircraft Maintenance Facilities** Year 2005 13,498 m<sup>2</sup>  
Year 2015 21,113 m<sup>2</sup>
- **Car Park** 300 units
- **Fuel Storage** 22,000 m<sup>2</sup>

- **Other Facilities**
  - Catering Factory 1,000 – 2,500 meals per hour
  - Hotel 700 beds for 2005  
1,800 beds for 2015
  - Training complex, fire fighting building, storage
- **Airport Staff** 340-440 staff

### (3) Estimated Project Cost

Cost required for implementation of the Project at the former site was estimated as shown below.

**Table 3.17.2 Project Cost**

| Cost Item   | Cost in Million Rubles |
|---|------------------------|
| 1) Land acquisition & site preparation  | 211.0                  |
| 2) Earthwork drainage and inundation protection   | 16.72                  |
| 3) Pavements  | 204.35                 |
| 4) Terminal Complex   | 111.23                 |
| 5) Auxiliary Facilities and Services  | 61.86                  |
| 6) Power Supply System  | 8.44                   |
| 7) Transport and Communication Facilities   | 9.26                   |
| 8) Exterior Engineering Network Facilities<br>(Water supply, Sewage system, Heating & Gas Supply) | 13.26                  |
| 9) Site Management  | 6.92                   |
| 10) Additional Expenses   | 137.40                 |
| <b>Total Project Cost</b>   | <b>780.44</b>          |
| <b>Construction of Airport Access</b>   |                        |
| a) Speedy Railway (Second Variant)  | 232.3                  |
| b) Highway from M-39 (Second Variant)   | 107.24                 |

### 3.17.3 Characteristics of the Site

After the cancellation of the former site for the new airport construction, further studies and investigations were not conducted, therefore, information related to the new site is very limited.

The new site is located 40 km southwest from Tashkent, near Almazar village in Chinaz, and between State Road M-39 and Railway lines as shown in Fig. 3.17.1. Location and runway orientation at the new site is not exactly decided to this date. The required area is estimated at 1,500 ha, in which area there are approx. 500 inhabitants.



(1) Topography

The new site is located at the altitude between approx. 330 m and 360 m above sea level, and is inclined gradually from north to southeast with rather flat topography. There are several streams and small rivers.

(2) Land Use

Land use around the site is mainly used for agricultural farm, and five settlements and village are scattered. Almazar is located about 4 km southwest of the site, and Yangiyul is 15 km northwest of the same. In determination of runway direction and flight course for the new airport, these matters should be taken into account.

(3) Weather

According to the explanation of NAC, prevailing wind direction is north east, and it is almost the same direction at the existing Tashkent Airport.

However, exact runway direction should be determined based on the wind observation records around the site, then it is recommended to install meteorological observation facilities at the site to collect weather data.

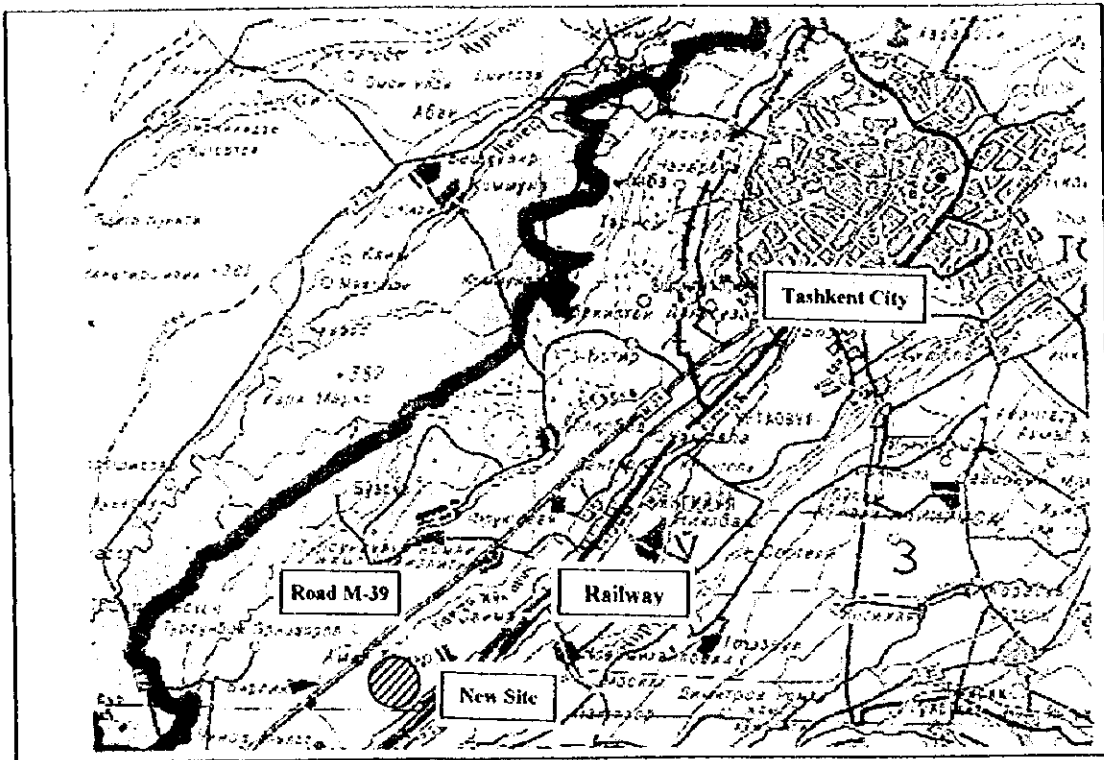
(4) Airspace

The new site is located 40 km southwest of the existing Tashkent airport. Above the site, SID and STAR air routes using radio beacons of SYRDARYA and TOYTEPA are established. Considering the possibility of simultaneous operation of two airports, the runway direction of the new airport it will be desirable to be the same direction as the existing runway (08/26) at Tashkent Airport in order to avoid intersection of both flight courses and overlap of airspace.

However, it will be difficult due to limited available area between M-39 and the railway lines. Therefore, a detailed study will be required for establishment of airspace for the new airport including rearrangement of airspace for both airports.

(5) Obstacles

The area around the site is mainly covered by a cotton farm, and there is no high structures or projected topography except the microwave tower located to the north of the site. This tower should be taken into account for determination of runway orientation.



**Fig. 3.17.1 Site for New Tashkent Airport**