4.2.10 Air Traffic Demand by Airport

Summarizing the previous study related to air traffic demand forecast, the air traffic demand by airports and air route are shown in **Table 4.2.55** to **Table 4.2.63**.

Among the three case of air traffic demand forecasts, the forecast demand of Case 1, the medium Case, is to be adopted for the master planning.

Table 4.2.55 Annual Air Passenger Traffic and Weekly Aircraft Movements by Airports (Case I)

Airport	Category	Annual Air Passenger Traffic (Departure and Arrival) (000)					Weekly Aircraft Movements (Departure and Arrival)				
		2000	2005	2010	2015	2020	2000	2005	2010	2015	2020
Tashkent	Domestic	786	927	1,079	1,241	1,411	326	334	342	346	370
	Inter-CIS	556	809	1,069	1,360	1,651	102	140	176	212	258
	International	512	734	963	1,194	1,410	66	94	124	150	182
	Total	1,854	2,470	3,111	3,795	4,475	494	568	642	708	810
Namangan	Domestic	211	288	349	416	489	116	158	172	200	208
	Inter-CIS	58	85	115	146	182	10	14	20	26	30
	International	0	16	21	27	33	0	2	2	4	4
	Total	269	389	485	589	704	126	174	194	230	242
Andizhan	Domestic	396	508	609	719	837	194	220	228	230	230
	Inter-CIS	68	100	135	175	214	12	16	24	30	38
	International	0	17	22	28	35	0	2	2	4	4
	Total	464	625	766	922	1,086	206	238	254	264	272
Fergana	Domestic	377	458	573	674	783	184	200	218	232	216
	Inter-CIS	75	117	158	197	241	14	22	30	34	42
	International	71	73	114	145	192	10	10	14	18	24
	Total	523	648	845	1,016	1,216	208	232	262	284	282
Kokand	Domestic	14	17	19	47	54	8	10	10	26	30
	Inter-CIS	0	0	0	0	0	0	0	0	0	0
	International	0	0	0	0	0	0	0	0	0	0
	Total	14	17	19	47	54	8	10	10	26	30
Samarkand	Domestic	199	267	318	373	460	110	126	132	146	166
	Inter-CIS	84	119	168	214	258	16	20	32	40	46
	International	77	102	139	191	233	10	14	16	24	30
	Total	360	488	625	778	951	136	160	180	210	242
Termez	Domestic	217	268	351	418	491	106	112	130	148	138
	Inter-CIS	35	55	74	94	115	4	10	12	16	20
	International	0	0	15	18	22	0	0	2	2	2
	Total	252	323	440	530	628	110	122	144	166	160
Karshi	Domestic	123	179	217	259	304	68	100	110	106	120
	Inter-CIS	56	81	109	139	174	10	14	18	24	30
	International	0	14	19	24	30	0	2	2	4	4
	Total	179	274	345	422	508	78	116	130	134	154
Bukhara	Domestic	197	238	282	331	383	96	116	108	124	108
	Inter-CIS	65	91	126	161	205	12	16	22	30	38
	International	25	69	93	102	140	4	8	10	14	18
	Total	287	398	501	594	728	112	140	140	168	164
Navoi	Domestic	25	55	90	105	121	14	30	48	56	68
	Inter-CIS	45	72	96	122	149	8	12	16	20	26
	International	0	0	0	15	19	0	0	0	2	2
	Total	70	127	186	242	289	22	42	64	78	96
Urgench	Domestic	296	387	489	603	703	112	126	144	174	182
	Inter-CIS	31	50	71	90	107	6	10	14	16	18
	International	14	21	13	32	56	2	2	2	4	6
	Total	341	458	573	725	866	120	138	160	194	206
Nukus	Domestic	176	212	252	296	370	84	100	110	112	128
	Inter-CIS	57	83	112	142	178	10	14	18	24	30
	International	0	0	15	20	24	0	0	2	2	4
	Total	233	295	379	458	572	94	114	130	138	162
others	Domestic	57	68	79	91	103	30	36	44	48	56
	Inter-CIS	0	0	0	0	0	0	0	0	0	0
	International	0	0	0	0	0	0	0	0	0	0
	Total	57	68	79	91	103	30	36	44	48	56
Total	Domestic	3,073	3,871	4,708	5,573	6,508	1,448	1,668	1,796	1,918	2,020
	Inter-CIS	1,131	1,663	2,232	2,839	3,478	204	288	382	472	576
	International	699	1,015	1,414	1,796	2,192	92	134	176	228	280
	Total	4,906	6,579	8,354	10,208	12,178	1,744	2,090	2,354	2,618	2,876

Table 4.2.56 Weekly Aircraft Movements (Departure and Arrival) by Aircraft Type (Case 1)

subject to MP : Mini Plane
SJ : Small Jet
MJ : Medium Jet
LJ : Large Jet

Airport	Category	2000				2005				2010				2015				2020			
		MP	SJ	MJ	LJ	MP	SJ	MJ	LJ	MP	SJ	MJ	LJ	MP	SJ	MJ	LJ	MP	SJ	MJ	LJ
Tashkent	Domestic	214	112	0	0	174	146	14	0	114	212	16	0	126	150	70	0	146	122	102	0
	Inter-CIS	32	14	56	0	28	30	82	0	20	46	96	14	24	44	128	16	28	52	158	20
	International	0	0	66	0	0	0	94	0	0	0	112	12	0	0	138	12	0	0	166	16
	Total	246	126	122	0	202	176	190	0	134	258	224	26	150	194	336	28	174	174	426	36
Namangan	Domestic	116	0	0	0	158	0	0	0	144	28	0	0	170	30	0	0	132	76	0	0
	Inter-CIS	2	2	6	0	4	2	8	0	4	4	12	0	6	4	16	0	8	4	18	0
	International	0	0	0	0	0	0	2	0	0	0	2	0	0	0	4	0	0	0	4	0
	Total	118	2	6	0	162	2	10	0	148	32	14	0	176	34	20	0	140	80	22	0
Andizhan	Domestic	162	32	0	0	162	58	0	0	124	104	0	0	80	136	14	0	54	148	28	0
	Inter-CIS	2	2	8	0	4	2	10	0	6	4	14	0	8	4	18	0	10	6	22	0
	International	0	0	0	0	0	0	2	0	0	0	2	0	0	0	4	0	0	0	4	0
	Total	164	34	8	0	166	60	12	0	130	108	16	0	88	140	36	0	64	154	54	0
Fergana	Domestic	154	30	0	0	144	56	0	0	118	100	0	0	94	124	14	0	48	140	28	0
	Inter-CIS	4	2	8	0	8	4	10	0	10	6	14	0	10	4	20	0	12	6	24	0
	International	0	0	10	0	0	0	10	0	0	0	14	0	0	0	18	0	0	0	24	0
	Total	158	32	18	0	152	60	20	0	128	106	28	0	104	128	52	0	60	146	76	0
Kokand	Domestic	8	0	0	0	10	0	0	0	10	0	0	0	26	0	0	0	30	0	0	0
	Inter-CIS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	International	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	8	0	0	0	10	0	0	0	10	0	0	0	26	0	0	0	30	0	0	0
Samarkand	Domestic	110	0	0	0	98	28	0	0	88	44	0	0	84	62	0	0	72	94	0	0
	Inter-CIS	6	2	8	0	6	2	12	0	10	6	16	0	12	6	22	0	14	6	26	0
	International	0	0	10	0	0	0	14	0	0	0	16	0	0	0	24	0	0	0	30	0
	Total	116	2	18	0	104	30	26	0	98	50	32	0	96	68	46	0	86	100	56	0
Termez	Domestic	90	16	0	0	70	42	0	0	70	60	0	0	86	48	14	0	36	88	14	0
	Inter-CIS	0	0	4	0	2	2	6	0	2	2	8	0	4	2	10	0	4	4	12	0
	International	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	2	0
	Total	90	16	4	0	72	44	6	0	72	62	10	0	90	50	26	0	40	92	28	0
Karshi	Domestic	68	0	0	0	100	0	0	0	96	14	0	0	64	42	0	0	74	46	0	0
	Inter-CIS	2	2	6	0	4	2	8	0	4	2	12	0	6	4	14	0	8	4	18	0
	International	0	0	0	0	0	0	2	0	0	0	2	0	0	0	4	0	0	0	4	0
	Total	70	2	6	0	104	2	10	0	100	16	14	0	70	46	18	0	82	50	22	0
Bukhara	Domestic	82	14	0	0	100	16	0	0	52	56	0	0	62	62	0	0	14	80	14	0
	Inter-CIS	4	2	6	0	4	2	10	0	6	4	12	0	10	4	16	0	12	6	20	0
	International	0	0	4	0	0	0	8	0	0	0	10	0	0	0	14	0	0	0	18	0
	Total	86	16	10	0	104	18	18	0	58	60	22	0	72	66	30	0	26	86	52	0
Navoi	Domestic	14	0	0	0	30	0	0	0	48	0	0	0	56	0	0	0	68	0	0	0
	Inter-CIS	0	2	6	0	2	2	8	0	4	2	10	0	4	4	12	0	6	4	16	0
	International	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
	Total	14	2	6	0	32	2	8	0	52	2	10	0	60	4	14	0	74	4	18	0
Urgench	Domestic	50	62	0	0	70	42	14	0	46	82	16	0	68	78	28	0	78	44	60	0
	Inter-CIS	2	0	4	0	2	2	6	0	4	2	8	0	6	2	8	0	6	2	10	0
	International	0	0	2	0	0	0	2	0	0	0	2	0	0	0	4	0	0	0	6	0
	Total	52	62	6	0	72	44	22	0	50	84	26	0	74	80	40	0	84	46	76	0
Nukus	Domestic	70	14	0	0	84	16	0	0	82	28	0	0	52	60	0	0	72	42	14	0
	Inter-CIS	2	2	6	0	4	2	8	0	4	2	12	0	6	4	14	0	8	4	18	0
	International	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	4	0
	Total	72	16	6	0	88	18	8	0	86	30	14	0	58	64	16	0	80	46	36	0
others	Domestic	30	0	0	0	36	0	0	0	44	0	0	0	48	0	0	0	56	0	0	0
	Inter-CIS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	International	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	30	0	0	0	36	0	0	0	44	0	0	0	48	0	0	0	56	0	0	0
Total	Domestic	1,168	280	0	0	1,236	401	28	0	1,036	728	32	0	1,016	792	140	0	880	880	260	0
	Inter-CIS	56	30	118	0	68	52	168	0	74	80	214	14	96	82	278	16	116	98	342	20
	International	0	0	92	0	0	0	134	0	0	0	164	12	0	0	216	12	0	0	264	16
	Total	1,224	310	210	0	1,304	456	330	0	1,110	808	410	26	1,112	874	634	28	996	978	866	36

Table 4.2.57 Annual Air Cargo Traffic and Annual Cargo Freighter Movements by Airports (Case I)

Airport	Category	Annual Air Cargo Traffic (Departure and Arrival) (tons)					Annual Freighter Movements (Departure and Arrival)				
		2000	2005	2010	2015	2020	2000	2005	2010	2015	2020
Tashkent	Domestic	904	1,753	2,668	3,612	4,669	0	0	0	0	0
	Inter-CIS	4,908	7,830	10,953	14,310	17,807	112	204	286	396	496
	International	15,285	20,771	27,670	32,294	37,210	740	992	1,334	1,530	1,760
	Total	21,097	30,354	41,291	50,216	59,686	852	1,196	1,620	1,926	2,256
Namangan	Domestic	243	514	863	1,221	1,617	0	0	0	0	0
	Inter-CIS	367	587	825	1,078	1,314	2	8	8	12	22
	International	769	1,189	1,633	2,093	2,569	46	66	96	120	146
	Total	1,379	2,320	3,321	4,392	5,530	48	74	104	132	168
Andizhan	Domestic	455	961	1,506	2,111	2,771	0	0	0	0	0
	Inter-CIS	729	1,166	1,637	2,145	2,675	18	40	56	76	94
	International	0	528	726	930	1,142	0	26	38	46	58
	Total	1,184	2,655	3,869	5,186	6,588	18	66	94	122	152
Fergana	Domestic	431	867	1,417	1,979	2,590	0	0	0	0	0
	Inter-CIS	1,161	1,880	2,640	3,441	4,299	48	88	122	166	201
	International	3,260	4,512	6,666	8,543	12,039	170	250	370	474	674
	Total	4,855	7,259	10,723	13,966	18,928	218	338	492	610	878
Kokand	Domestic	17	32	48	139	180	0	0	0	0	0
	Inter-CIS	0	0	0	0	0	0	0	0	0	0
	International	0	0	0	0	0	0	0	0	0	0
	Total	17	32	48	139	180	0	0	0	0	0
Samarkand	Domestic	229	505	786	1,094	1,521	0	0	0	0	0
	Inter-CIS	520	819	1,178	1,538	1,911	4	8	14	20	30
	International	2,820	3,777	5,275	7,856	9,611	142	200	294	426	516
	Total	3,569	5,101	7,239	10,488	13,073	146	208	308	446	546
Termez	Domestic	249	506	867	1,228	1,625	0	0	0	0	0
	Inter-CIS	311	510	716	935	1,166	6	10	18	24	32
	International	0	0	317	407	499	0	0	14	18	24
	Total	560	1,016	1,900	2,570	3,290	6	10	32	42	56
Karshi	Domestic	142	339	537	760	1,005	0	0	0	0	0
	Inter-CIS	804	1,286	1,806	2,360	2,952	32	54	78	106	134
	International	0	583	801	1,026	1,260	0	30	44	52	66
	Total	946	2,208	3,144	4,146	5,217	32	84	122	158	200
Bukhara	Domestic	227	450	698	971	1,266	0	0	0	0	0
	Inter-CIS	613	945	1,335	1,744	2,216	20	30	44	56	70
	International	688	3,925	5,393	5,792	7,678	30	220	306	362	464
	Total	1,528	5,320	7,426	8,507	11,160	50	250	350	418	534
Navoi	Domestic	29	103	223	308	399	0	0	0	0	0
	Inter-CIS	855	1,404	1,971	2,575	3,212	32	66	96	130	158
	International	0	0	0	1,120	1,374	0	0	0	64	80
	Total	884	1,507	2,191	4,003	4,985	32	66	96	194	238
Urgench	Domestic	310	731	1,210	1,771	2,326	0	0	0	0	0
	Inter-CIS	381	609	860	1,124	1,398	10	18	28	44	56
	International	315	488	380	2,555	3,430	14	24	24	146	194
	Total	1,036	1,828	2,450	5,450	7,154	24	42	52	190	250
Nukus	Domestic	202	401	624	867	1,223	0	0	0	0	0
	Inter-CIS	292	467	655	856	1,071	0	0	0	4	4
	International	0	0	291	372	457	0	0	12	16	16
	Total	494	868	1,570	2,095	2,752	0	0	12	20	20
others	Domestic	66	128	195	266	342	0	0	0	0	0
	Inter-CIS	0	0	0	0	0	0	0	0	0	0
	International	0	0	0	0	0	0	0	0	0	0
	Total	66	128	195	266	342	0	0	0	0	0
Total	Domestic	3,536	7,319	11,641	16,358	21,535	0	0	0	0	0
	Inter-CIS	10,941	17,503	24,575	32,108	40,052	281	526	750	1,034	1,300
	International	23,139	35,773	49,153	62,987	77,298	1,142	1,808	2,532	3,254	3,998
	Total	37,616	60,595	85,369	111,453	138,885	1,426	2,334	3,282	4,288	5,298

Table 4.2.58 Annual Air Passenger Traffic and Weekly Aircraft Movements by Airports (Case 2)

Airport	Category	Annual Air Passenger Traffic (Departure and Arrival) ('000)					Weekly Aircraft Movements (Departure and Arrival)				
		2000	2005	2010	2015	2020	2000	2005	2010	2015	2020
Tashkent	Domestic	810	1,004	1,237	1,520	1,858	314	338	316	368	416
	Inter-CIS	602	938	1,355	1,836	2,435	102	150	212	278	358
	International	525	775	1,046	1,306	1,630	66	100	134	168	208
	Total	1,937	2,717	3,638	4,662	5,923	482	588	692	814	982
Namangan	Domestic	218	311	400	509	674	120	161	192	206	230
	Inter-CIS	63	100	145	204	270	10	16	26	36	46
	International	0	17	23	30	53	0	2	2	4	6
	Total	281	428	568	743	997	130	182	220	246	282
Andizhan	Domestic	408	550	699	881	1,188	182	232	222	232	294
	Inter-CIS	74	118	174	239	324	12	20	30	42	58
	International	0	17	24	32	70	0	2	4	4	10
	Total	482	685	897	1,152	1,582	194	254	256	278	362
Fergana	Domestic	389	496	657	826	1,112	186	200	228	230	278
	Inter-CIS	81	138	196	269	350	14	26	34	48	64
	International	72	78	124	176	177	10	12	14	22	24
	Total	542	712	977	1,271	1,639	210	238	276	300	366
Kokand	Domestic	15	18	22	58	158	8	10	12	30	86
	Inter-CIS	0	0	0	0	0	0	0	0	0	0
	International	0	0	0	0	0	0	0	0	0	0
	Total	15	18	22	58	158	8	10	12	30	86
Samarkand	Domestic	206	289	365	511	667	101	128	142	170	212
	Inter-CIS	91	147	213	292	384	16	30	40	52	68
	International	80	107	151	213	269	10	14	20	26	34
	Total	377	543	729	1,016	1,320	130	172	202	248	314
Termez	Domestic	223	290	402	537	766	106	130	140	160	202
	Inter-CIS	38	65	94	128	174	6	10	16	22	30
	International	0	0	16	21	26	0	0	2	2	4
	Total	261	355	512	686	966	112	120	158	184	236
Karshi	Domestic	127	191	249	317	428	70	106	112	114	136
	Inter-CIS	60	96	139	194	258	10	16	24	34	44
	International	0	15	21	27	34	0	2	2	4	4
	Total	187	305	409	538	720	80	124	138	152	184
Bukhara	Domestic	203	257	324	405	556	98	116	116	112	160
	Inter-CIS	67	111	160	229	299	12	20	30	42	54
	International	26	72	101	115	162	4	10	14	16	20
	Total	296	440	585	749	1,017	114	146	160	170	234
Navoi	Domestic	26	59	103	128	190	14	34	58	70	104
	Inter-CIS	53	84	121	167	226	10	14	20	28	40
	International	0	0	0	17	21	0	0	0	2	2
	Total	79	143	224	312	437	24	48	78	100	146
Urgench	Domestic	305	419	562	739	953	108	140	152	190	238
	Inter-CIS	37	59	90	127	168	6	10	16	24	30
	International	14	22	14	51	64	2	2	2	6	6
	Total	356	500	666	917	1,185	116	152	170	220	274
Nukus	Domestic	181	230	289	391	517	86	100	112	134	152
	Inter-CIS	61	98	142	198	263	10	16	24	36	46
	International	0	0	17	22	28	0	0	2	2	4
	Total	242	328	448	611	808	96	116	138	172	202
others	Domestic	59	73	90	111	303	32	42	48	60	168
	Inter-CIS	0	0	0	0	0	0	0	0	0	0
	International	0	0	0	0	0	0	0	0	0	0
	Total	59	73	90	111	303	32	42	48	60	168
Total	Domestic	3,169	4,190	5,400	6,933	9,369	1,428	1,720	1,880	2,076	2,676
	Inter-CIS	1,226	1,951	2,828	3,883	5,151	208	328	472	612	838
	International	717	1,103	1,535	2,009	2,534	92	144	196	256	322
	Total	5,112	7,244	9,763	12,825	17,054	1,728	2,192	2,548	2,974	3,836

Table 4.2.59 Weekly Aircraft Movements (Departure and Arrival) by Aircraft Type (Case 2)

subject to MP : Mini Plane
SJ : Small Jet
MJ : Medium Jet
LJ : Large Jet

Airport	Category	2000				2005				2010				2015				2020			
		MP	SJ	MJ	LJ	MP	SJ	MJ	LJ	MP	SJ	MJ	LJ	MP	SJ	MJ	LJ	MP	SJ	MJ	LJ
Tashkent	Domestic	200	100	14	0	148	176	14	0	126	150	70	0	100	158	110	0	124	132	160	0
	Inter-CIS	20	22	60	0	18	38	94	0	24	44	128	16	28	48	180	22	18	70	240	30
	International	0	0	66	0	0	0	92	8	0	0	122	12	0	0	152	16	0	0	188	20
	Total	220	122	140	0	166	214	200	8	150	194	320	28	128	206	442	38	142	202	588	50
Namangan	Domestic	120	0	0	0	150	14	0	0	164	28	0	0	118	88	0	0	76	154	0	0
	Inter-CIS	2	2	6	0	4	2	10	0	6	4	16	0	10	6	20	0	12	6	28	0
	International	0	0	0	0	0	0	2	0	0	0	2	0	0	0	4	0	0	0	6	0
	Total	122	2	6	0	154	16	12	0	170	32	18	0	128	94	24	0	88	160	34	0
Andizhan	Domestic	128	54	0	0	154	78	0	0	78	130	14	0	54	134	14	0	78	140	76	0
	Inter-CIS	2	2	8	0	4	4	12	0	8	4	18	0	12	6	24	0	16	10	32	0
	International	0	0	0	0	0	0	2	0	0	0	4	0	0	0	4	0	0	0	10	0
	Total	130	56	8	0	158	82	14	0	86	134	36	0	66	140	72	0	94	150	118	0
Fergana	Domestic	156	30	0	0	112	88	0	0	110	104	14	0	50	150	30	0	72	134	72	0
	Inter-CIS	4	2	8	0	8	6	12	0	10	4	20	0	14	6	28	0	20	8	36	0
	International	0	0	10	0	0	0	12	0	0	0	14	0	0	0	22	0	0	0	24	0
	Total	160	32	18	0	120	94	24	0	120	108	48	0	64	156	80	0	92	142	132	0
Kokand	Domestic	8	0	0	0	10	0	0	0	12	0	0	0	30	0	0	0	86	0	0	0
	Inter-CIS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	International	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	8	0	0	0	10	0	0	0	12	0	0	0	30	0	0	0	86	0	0	0
Samarkand	Domestic	90	14	0	0	84	14	0	0	82	60	0	0	70	86	14	0	102	80	30	0
	Inter-CIS	6	2	8	0	10	6	14	0	12	6	22	0	16	6	30	0	20	10	38	0
	International	0	0	10	0	0	0	14	0	0	0	20	0	0	0	26	0	0	0	34	0
	Total	96	16	18	0	94	50	28	0	94	66	42	0	86	92	70	0	122	90	102	0
Termez	Domestic	90	16	0	0	52	58	0	0	80	46	14	0	50	94	16	0	92	54	56	0
	Inter-CIS	0	2	4	0	2	2	6	0	4	2	10	0	4	4	14	0	8	4	18	0
	International	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	4	0
	Total	90	18	4	0	54	60	6	0	84	48	26	0	54	98	32	0	100	58	78	0
Karshi	Domestic	70	0	0	0	106	0	0	0	84	28	0	0	58	56	0	0	30	106	0	0
	Inter-CIS	2	2	6	0	4	2	10	0	6	4	14	0	10	4	20	0	12	6	26	0
	International	0	0	0	0	0	0	2	0	0	0	2	0	0	0	4	0	0	0	4	0
	Total	72	2	6	0	110	2	12	0	90	32	16	0	68	60	24	0	42	112	30	0
Bukhara	Domestic	84	14	0	0	86	30	0	0	56	60	0	0	14	84	14	0	44	100	16	0
	Inter-CIS	2	2	8	0	6	2	12	0	10	4	16	0	12	8	22	0	14	8	32	0
	International	0	0	4	0	0	0	10	0	0	0	14	0	0	0	16	0	0	0	20	0
	Total	86	16	12	0	92	32	22	0	66	64	30	0	26	92	52	0	58	108	68	0
Navoi	Domestic	14	0	0	0	34	0	0	0	58	0	0	0	70	0	0	0	104	0	0	0
	Inter-CIS	2	2	6	0	4	2	8	0	4	4	12	0	6	4	18	0	10	6	24	0
	International	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
	Total	16	2	6	0	38	2	8	0	62	4	12	0	76	4	20	0	114	6	26	0
Urgench	Domestic	52	42	14	0	80	46	14	0	50	74	28	0	82	46	62	0	98	66	74	0
	Inter-CIS	2	0	4	0	2	2	6	0	6	2	8	0	6	6	12	0	8	6	16	0
	International	0	0	2	0	0	0	2	0	0	0	2	0	0	0	6	0	0	0	6	0
	Total	54	42	20	0	82	48	22	0	56	76	38	0	88	52	80	0	106	72	96	0
Nukus	Domestic	72	14	0	0	74	26	0	0	52	60	0	0	76	44	14	0	50	86	16	0
	Inter-CIS	2	2	6	0	4	2	10	0	6	4	14	0	10	6	20	0	12	6	28	0
	International	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	4	0
	Total	74	16	6	0	78	28	10	0	58	64	16	0	86	50	36	0	62	92	48	0
others	Domestic	32	0	0	0	42	0	0	0	48	0	0	0	60	0	0	0	168	0	0	0
	Inter-CIS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	International	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	32	0	0	0	42	0	0	0	48	0	0	0	60	0	0	0	168	0	0	0
Total	Domestic	1,116	284	28	0	1,132	560	28	0	1,000	740	140	0	832	940	304	0	1,124	1,052	500	0
	Inter-CIS	44	40	124	0	66	68	194	0	96	82	278	16	128	104	388	22	150	140	518	30
	International	0	0	92	0	0	0	136	8	0	0	184	12	0	0	240	16	0	0	302	20
	Total	1,160	324	244	0	1,198	628	358	8	1,096	822	602	28	960	1,044	932	38	1,274	1,192	1,320	50

Table 4.2.60 Annual Air Cargo Traffic and Annual Cargo Freighter Movements by Airports (Case 2)

Airport	Category	Annual Air Cargo Traffic (Departure and Arrival) (tons)					Annual Freighter Movements (Departure and Arrival)				
		2000	2005	2010	2015	2020	2000	2005	2010	2015	2020
Tashkent	Domestic	1,008	2,119	3,466	5,088	7,032	0	0	0	0	0
	Inter-CIS	5,401	9,358	14,186	19,933	26,886	122	252	390	562	770
	International	15,532	21,506	29,233	33,243	41,130	756	1,018	1,400	1,578	1,904
	Total	21,941	32,983	46,885	58,264	75,048	878	1,270	1,790	2,140	2,674
Namangan	Domestic	270	657	1,121	1,706	2,551	0	0	0	0	0
	Inter-CIS	404	705	1,068	1,507	2,032	4	8	12	22	28
	International	781	1,231	1,726	2,260	2,839	48	68	102	128	158
	Total	1,455	2,593	3,915	5,473	7,422	52	76	114	150	186
Andizhan	Domestic	507	1,161	1,956	2,949	4,497	0	0	0	0	0
	Inter-CIS	802	1,398	2,126	2,998	4,074	26	48	76	108	150
	International	0	547	767	1,005	4,655	0	28	34	50	260
	Total	1,309	3,106	4,849	6,952	13,226	26	76	110	158	410
Fergana	Domestic	484	1,047	1,841	2,765	4,209	0	0	0	0	0
	Inter-CIS	1,278	2,255	3,414	4,819	6,469	58	101	162	224	306
	International	3,313	4,672	7,043	10,593	9,914	174	254	396	592	636
	Total	5,075	7,974	12,298	18,177	20,592	232	358	558	816	942
Kokand	Domestic	19	38	62	194	598	0	0	0	0	0
	Inter-CIS	0	0	0	0	0	0	0	0	0	0
	International	0	0	0	0	0	0	0	0	0	0
	Total	19	38	62	194	598	0	0	0	0	0
Samarkand	Domestic	256	611	1,021	1,711	2,525	0	0	0	0	0
	Inter-CIS	572	1,006	1,525	2,146	2,869	6	10	20	32	46
	International	2,865	3,911	5,573	8,483	10,657	148	210	306	464	568
	Total	3,693	5,528	8,119	12,340	16,071	154	220	326	496	614
Termez	Domestic	278	612	1,127	1,800	2,900	0	0	0	0	0
	Inter-CIS	342	611	927	1,307	1,768	6	18	24	34	50
	International	0	0	335	439	552	0	0	14	20	22
	Total	620	1,223	2,389	3,546	5,220	6	18	38	54	72
Karshi	Domestic	158	410	698	1,061	1,619	0	0	0	0	0
	Inter-CIS	885	1,543	2,339	3,308	4,462	36	66	104	146	204
	International	0	604	846	1,108	1,392	0	32	46	56	74
	Total	1,043	2,557	3,883	5,477	7,473	36	98	150	202	278
Bukhara	Domestic	253	543	907	1,357	2,106	0	0	0	0	0
	Inter-CIS	650	1,140	1,729	2,484	3,337	14	30	54	80	108
	International	699	4,064	5,698	6,254	8,487	30	222	310	384	504
	Total	1,602	5,747	8,334	10,095	13,930	44	252	364	464	612
Navoi	Domestic	32	125	289	430	717	0	0	0	0	0
	Inter-CIS	966	1,683	2,553	3,600	4,868	42	82	130	180	242
	International	0	0	0	1,209	1,519	0	0	0	70	88
	Total	998	1,808	2,842	5,239	7,104	42	82	130	250	330
Urgench	Domestic	379	884	1,572	2,474	3,608	0	0	0	0	0
	Inter-CIS	419	731	1,114	1,588	2,142	12	26	42	60	82
	International	321	505	401	3,019	3,792	14	26	26	170	216
	Total	1,119	2,120	3,087	7,081	9,542	26	52	68	230	298
Nukus	Domestic	225	485	810	1,311	1,959	0	0	0	0	0
	Inter-CIS	321	560	849	1,200	1,619	0	0	2	4	4
	International	0	0	307	402	505	0	0	12	18	18
	Total	546	1,045	1,966	2,913	4,083	0	0	14	22	22
others	Domestic	73	154	253	372	1,148	0	0	0	0	0
	Inter-CIS	0	0	0	0	0	0	0	0	0	0
	International	0	0	0	0	0	0	0	0	0	0
	Total	73	154	253	372	1,148	0	0	0	0	0
Total	Domestic	3,941	8,847	15,123	23,216	35,468	0	0	0	0	0
	Inter-CIS	12,039	20,989	31,830	44,889	60,546	326	644	1,016	1,452	1,990
	International	23,511	37,040	51,929	68,015	85,441	1,170	1,858	2,646	3,530	4,448
	Total	39,491	66,876	98,882	136,120	181,455	1,496	2,502	3,662	4,982	6,438

Table 4.2.61 Annual Air Passenger Traffic and Weekly Aircraft Movements by Airports (Case 3)

Airport	Category	Annual Air Passenger Traffic (Departure and Arrival) ('000)					Weekly Aircraft Movements (Departure and Arrival)				
		2000	2005	2010	2015	2020	2000	2005	2010	2015	2020
Tashkent	Domestic	741	816	891	965	1,040	306	316	326	336	344
	Inter-CIS	480	681	748	874	1,001	90	102	124	142	162
	International	513	701	880	1,068	1,226	68	90	110	136	154
	Total	1,734	2,128	2,519	2,907	3,267	464	508	560	614	660
Namangan	Domestic	176	229	288	324	360	96	126	158	170	180
	Inter-CIS	50	64	78	93	107	10	10	14	16	18
	International	0	15	19	24	28	0	2	2	4	4
	Total	226	308	385	441	495	106	138	174	190	202
Andizhan	Domestic	373	425	503	559	617	190	186	212	226	226
	Inter-CIS	58	75	92	109	125	10	12	16	18	22
	International	0	15	20	25	29	0	2	2	4	4
	Total	431	515	615	693	771	200	200	230	248	252
Fergana	Domestic	356	403	452	501	577	180	192	198	200	218
	Inter-CIS	61	82	101	127	147	10	16	20	24	30
	International	69	69	89	126	150	8	8	12	16	20
	Total	486	554	642	754	874	198	216	230	240	268
Kokand	Domestic	14	15	16	17	18	8	8	8	10	10
	Inter-CIS	0	0	0	0	0	0	0	0	0	0
	International	0	0	0	0	0	0	0	0	0	0
	Total	14	15	16	17	18	8	8	8	10	10
Samarkand	Domestic	188	212	262	290	318	102	106	132	128	132
	Inter-CIS	72	92	109	129	157	14	16	18	24	30
	International	76	108	138	154	198	10	14	18	20	24
	Total	336	412	509	573	673	126	136	168	172	186
Termez	Domestic	204	236	268	325	362	96	112	106	126	134
	Inter-CIS	30	38	50	60	69	4	6	10	10	12
	International	0	0	0	16	19	0	0	0	2	2
	Total	234	274	318	401	450	100	118	116	138	148
Karshi	Domestic	116	133	179	201	224	64	74	98	112	106
	Inter-CIS	44	61	75	88	102	6	10	12	16	16
	International	0	0	17	21	25	0	0	2	2	4
	Total	160	194	271	310	351	70	84	112	130	126
Bukhara	Domestic	186	209	233	257	282	92	102	112	110	118
	Inter-CIS	56	68	83	102	118	12	12	14	18	20
	International	25	51	83	103	106	4	6	10	14	14
	Total	267	328	399	462	506	108	120	136	142	152
Navoi	Domestic	23	26	53	58	89	12	14	30	32	50
	Inter-CIS	39	54	66	78	90	6	10	10	14	16
	International	0	0	0	0	16	0	0	0	0	2
	Total	62	80	119	136	195	18	24	40	46	68
Urgench	Domestic	279	317	382	450	496	122	110	128	154	150
	Inter-CIS	32	37	46	54	63	6	6	8	10	10
	International	0	20	26	15	47	0	2	4	2	6
	Total	311	374	454	519	606	128	118	140	166	166
Nukus	Domestic	143	187	208	230	252	68	86	100	108	114
	Inter-CIS	45	62	76	90	101	8	10	12	16	16
	International	0	0	0	17	20	0	0	0	2	2
	Total	188	249	284	337	376	76	96	112	126	132
others	Domestic	54	60	65	71	76	28	32	36	40	42
	Inter-CIS	0	0	0	0	0	0	0	0	0	0
	International	0	0	0	0	0	0	0	0	0	0
	Total	54	60	65	71	76	28	32	36	40	42
Total	Domestic	2,852	3,266	3,799	4,248	4,710	1,364	1,461	1,611	1,752	1,824
	Inter-CIS	965	1,245	1,524	1,803	2,083	176	210	258	308	352
	International	682	978	1,273	1,569	1,861	90	124	160	202	236
	Total	4,499	5,489	6,596	7,620	8,653	1,630	1,798	2,062	2,262	2,412

Table 4.2.62 Weekly Aircraft Movements (Departure and Arrival) by Aircraft Type (Case 3)

subject to MP : Mini Plane
SJ : Small Jet
MJ : Medium Jet
LJ : Large Jet

Airport	Category	2000				2005				2010				2015				2020			
		MP	SJ	MJ	LJ	MP	SJ	MJ	LJ	MP	SJ	MJ	LJ	MP	SJ	MJ	LJ	MP	SJ	MJ	LJ
Tashkent	Domestic	200	106	0	0	202	100	14	0	186	126	14	0	160	162	14	0	130	198	16	0
	Inter-CIS	30	12	48	0	20	22	60	0	22	26	76	0	16	38	88	0	18	42	102	0
	International	0	0	68	0	0	0	90	0	0	0	102	8	0	0	124	12	0	0	142	12
	Total	230	118	116	0	222	122	164	0	208	152	192	8	176	200	226	12	148	240	260	12
Namangan	Domestic	96	0	0	0	126	0	0	0	158	0	0	0	156	14	0	0	152	28	0	0
	Inter-CIS	2	2	6	0	2	2	6	0	4	2	8	0	4	2	10	0	4	2	12	0
	International	0	0	0	0	0	0	2	0	0	0	2	0	0	0	4	0	0	0	4	0
	Total	98	2	6	0	128	2	8	0	162	2	10	0	160	16	14	0	156	30	16	0
Andizhan	Domestic	174	16	0	0	132	54	0	0	142	70	0	0	136	90	0	0	108	118	0	0
	Inter-CIS	2	2	6	0	2	2	8	0	4	2	10	0	4	2	12	0	4	4	14	0
	International	0	0	0	0	0	0	2	0	0	0	2	0	0	0	4	0	0	0	4	0
	Total	176	18	6	0	134	56	10	0	146	72	12	0	140	92	16	0	112	122	18	0
Fergana	Domestic	164	16	0	0	162	30	0	0	144	54	0	0	114	86	0	0	118	100	0	0
	Inter-CIS	2	2	6	0	6	2	8	0	8	2	10	0	8	4	12	0	10	6	14	0
	International	0	0	8	0	0	0	8	0	0	0	12	0	0	0	16	0	0	0	20	0
	Total	166	18	14	0	168	32	16	0	152	56	22	0	122	90	28	0	128	106	34	0
Kokand	Domestic	8	0	0	0	8	0	0	0	8	0	0	0	10	0	0	0	10	0	0	0
	Inter-CIS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	International	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	8	0	0	0	8	0	0	0	8	0	0	0	10	0	0	0	10	0	0	0
Samarkand	Domestic	102	0	0	0	92	14	0	0	118	14	0	0	84	44	0	0	88	44	0	0
	Inter-CIS	6	2	6	0	6	2	8	0	6	2	10	0	8	4	12	0	10	6	14	0
	International	0	0	10	0	0	0	14	0	0	0	18	0	0	0	20	0	0	0	24	0
	Total	108	2	16	0	98	16	22	0	124	16	28	0	92	48	32	0	98	50	38	0
Fermez	Domestic	82	14	0	0	96	16	0	0	50	56	0	0	68	58	0	0	74	60	0	0
	Inter-CIS	0	0	4	0	0	2	4	0	2	2	6	0	2	2	6	0	2	2	8	0
	International	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
	Total	82	14	4	0	96	18	4	0	52	58	6	0	70	60	8	0	76	62	10	0
Karshi	Domestic	64	0	0	0	74	0	0	0	98	0	0	0	112	0	0	0	78	28	0	0
	Inter-CIS	0	2	4	0	2	2	6	0	2	2	8	0	4	2	10	0	4	2	10	0
	International	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	4	0
	Total	64	2	4	0	76	2	6	0	100	2	10	0	116	2	12	0	82	30	14	0
Bukhara	Domestic	78	14	0	0	88	14	0	0	98	14	0	0	66	44	0	0	72	46	0	0
	Inter-CIS	4	2	6	0	2	2	8	0	4	2	8	0	6	2	10	0	6	2	12	0
	International	0	0	4	0	0	0	6	0	0	0	10	0	0	0	14	0	0	0	14	0
	Total	82	16	10	0	90	16	14	0	102	16	18	0	72	46	24	0	78	48	26	0
Navoi	Domestic	12	0	0	0	14	0	0	0	30	0	0	0	32	0	0	0	50	0	0	0
	Inter-CIS	0	2	4	0	2	2	6	0	2	2	6	0	4	2	8	0	4	2	10	0
	International	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
	Total	12	2	4	0	16	2	6	0	32	2	6	0	36	2	8	0	54	2	12	0
Urgench	Domestic	90	32	0	0	54	42	14	0	72	42	14	0	94	46	14	0	48	86	16	0
	Inter-CIS	2	0	4	0	2	0	4	0	2	2	4	0	2	2	6	0	2	2	6	0
	International	0	0	0	0	0	0	2	0	0	0	4	0	0	0	2	0	0	0	6	0
	Total	92	32	4	0	56	42	20	0	74	44	22	0	96	48	22	0	50	88	28	0
Nukus	Domestic	54	14	0	0	72	14	0	0	84	16	0	0	92	16	0	0	86	28	0	0
	Inter-CIS	0	2	6	0	2	2	6	0	2	2	8	0	4	2	10	0	4	2	10	0
	International	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
	Total	54	16	6	0	74	16	6	0	86	18	8	0	96	18	12	0	90	30	12	0
others	Domestic	28	0	0	0	32	0	0	0	36	0	0	0	40	0	0	0	42	0	0	0
	Inter-CIS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	International	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	28	0	0	0	32	0	0	0	36	0	0	0	40	0	0	0	42	0	0	0
Total	Domestic	1,152	212	0	0	1,152	281	28	0	1,224	392	28	0	1,161	560	28	0	1,056	736	32	0
	Inter-CIS	48	28	100	0	46	40	124	0	58	46	154	0	62	62	184	0	68	72	212	0
	International	0	0	90	0	0	0	124	0	0	0	152	8	0	0	190	12	0	0	224	12
	Total	1,200	240	190	0	1,198	324	276	0	1,282	438	334	8	1,226	622	402	12	1,124	808	468	12

Table 4.2.63 Annual Air Cargo Traffic and Annual Cargo Freighter Movements by Airports (Case 3)

Airport	Category	Annual Air Cargo Traffic (Departure and Arrival) (tons)					Annual Freighter Movements (Departure and Arrival)				
		2000	2005	2010	2015	2020	2000	2005	2010	2015	2020
Tashkent	Domestic	691	1,182	1,673	2,161	2,654	0	0	0	0	0
	Inter-CIS	3,998	5,557	7,125	8,660	10,196	84	138	186	238	284
	International	15,779	20,744	26,926	33,132	35,964	762	1,004	1,328	1,632	1,756
	Total	20,468	27,483	35,724	43,956	48,814	846	1,142	1,514	1,870	2,040
Namangan	Domestic	161	332	541	725	919	0	0	0	0	0
	Inter-CIS	299	416	533	650	768	0	4	4	6	6
	International	778	1,170	1,563	1,956	2,348	48	66	94	112	136
	Total	1,241	1,918	2,637	3,331	4,035	48	70	98	118	142
Andizhan	Domestic	348	615	944	1,254	1,575	0	0	0	0	0
	Inter-CIS	593	825	1,058	1,291	1,524	16	26	34	42	50
	International	0	520	695	869	1,044	0	26	36	42	52
	Total	941	1,960	2,697	3,414	4,143	16	52	70	84	102
Fergana	Domestic	332	584	848	1,123	1,472	0	0	0	0	0
	Inter-CIS	910	1,315	1,686	2,081	2,457	40	56	76	94	108
	International	3,298	4,443	5,933	7,982	9,585	180	256	332	446	534
	Total	4,570	6,342	8,467	11,186	13,514	220	312	408	540	642
Kokand	Domestic	13	21	30	38	47	0	0	0	0	0
	Inter-CIS	0	0	0	0	0	0	0	0	0	0
	International	0	0	0	0	0	0	0	0	0	0
	Total	13	21	30	38	47	0	0	0	0	0
Samarkand	Domestic	175	307	493	650	812	0	0	0	0	0
	Inter-CIS	336	589	743	907	1,096	4	8	10	12	16
	International	2,852	4,292	5,352	6,317	8,835	146	222	298	366	500
	Total	3,363	5,188	6,588	7,874	10,723	150	230	308	378	516
Termez	Domestic	191	341	503	729	924	0	0	0	0	0
	Inter-CIS	253	352	463	564	666	2	8	8	16	16
	International	0	0	0	380	456	0	0	0	18	22
	Total	444	693	966	1,673	2,046	2	8	8	34	38
Karshi	Domestic	108	193	337	451	571	0	0	0	0	0
	Inter-CIS	637	911	1,167	1,424	1,681	26	38	50	58	76
	International	0	0	766	959	1,152	0	0	42	54	58
	Total	745	1,104	2,270	2,834	3,404	26	38	92	112	134
Bukhara	Domestic	173	303	438	577	720	0	0	0	0	0
	Inter-CIS	498	669	857	1,053	1,243	12	18	28	34	38
	International	696	3,571	5,161	6,458	6,498	30	204	290	358	412
	Total	1,367	4,543	6,456	8,088	8,461	42	222	318	392	450
Navoi	Domestic	22	37	99	130	227	0	0	0	0	0
	Inter-CIS	695	994	1,274	1,554	1,834	28	46	64	76	86
	International	0	0	0	0	1,257	0	0	0	0	72
	Total	717	1,031	1,373	1,684	3,318	28	46	64	76	158
Urgench	Domestic	260	459	718	1,008	1,267	0	0	0	0	0
	Inter-CIS	316	431	553	675	796	8	16	22	22	32
	International	0	480	641	454	3,136	0	24	28	28	176
	Total	576	1,370	1,912	2,137	5,199	8	40	50	50	208
Nukus	Domestic	133	271	391	515	643	0	0	0	0	0
	Inter-CIS	231	330	424	517	610	0	0	0	0	4
	International	0	0	0	348	418	0	0	0	16	20
	Total	364	601	815	1,380	1,671	0	0	0	16	24
others	Domestic	50	86	122	158	195	0	0	0	0	0
	Inter-CIS	0	0	0	0	0	0	0	0	0	0
	International	0	0	0	0	0	0	0	0	0	0
	Total	50	86	122	158	195	0	0	0	0	0
Total	Domestic	2,661	4,732	7,137	9,522	12,024	0	0	0	0	0
	Inter-CIS	8,891	12,388	15,882	19,375	22,869	220	358	482	598	716
	International	23,403	35,220	47,038	58,855	70,672	1,166	1,802	2,448	3,072	3,738
	Total	34,958	52,340	70,057	87,752	105,565	1,386	2,160	2,930	3,670	4,454

4.3 Basic Development Strategy for Air Transport Facilities

4.3.1 Overview

After the dissolution of the former Soviet Union, air transport and its facilities have been managed and operated under the control of NAC, which was founded in 1992. During period of the former Soviet Union, Tashkent airport had functioned as one of the international gateways of the air transport network in the Union and regional area., and air passenger traffic volume in Uzbekistan was recorded at more than 6 million in 1990. However, the air passenger traffic in Uzbekistan has been sharply decreasing since the independence. In 1996, the passenger volume declined to less than a quarter of that of 1990 level.

Airport facilities and air navigation facilities were mainly installed in the 1970s-80s, and a large part of them is superannuated. Many projects to improve these airport facilities were planned, but after independence, the implementation was suspended due to budgetary problems and the decline in air traffic demand.

On the other hand, Uzbekistan Airways currently operates more than 75 international and CIS flights a week. Presently, by introducing the western-made aircraft such as A-310, B-767 and RJ-85, NAC has contemplated strengthening and up-grading of its operational capacity.

Taking into consideration the geographical advantage of Tashkent, being located at the cross point between Europe and Southeast Asia, NAC considers that Uzbekistan is to be an air transportation center in the Central Asian region. NAC also places high priority into modernization of the existing Tashkent airport and air navigation systems, and is considering construction of new airports as one of the possible alternatives.

Under these circumstances, taking into account the results of demand forecast described in the previous sub chapter, the basic philosophy for the air route network, airport classification and planning criteria are established as below:

4.3.2 Air Route Network

(1) Future Demand and Basic Premises

In developing the air route networks in the air transport development of Uzbekistan, there are two aspects to be particularly emphasized.

Firstly, if air transport is considered as part of the public transportation system, it is necessary to provide a wide and fair service offering convenience to the public. From this viewpoint, air transport will be expected to meet the followings prerequisites:

- To provide direct air flight services from the nearest airports of the passenger demand area;
- To provide sufficient seat capacity to meet the air traffic demand;
- To provide, on a frequent basis, regular scheduled services to cope with multi-purpose travel needs.

Secondarily, from the viewpoints of airline management and financial profitability, the operation of air transport will need to be managed under a self-supporting system and be business-minded, meeting the following prerequisites:

- To plan and control number of destination airports, in order to operate the airlines' fleet and flight crew efficiently and economically.;

- To provide the optimum seat capacity and flight frequency in order to keep the load factor profitable.

The above two aspects appear contradictory to each other; therefore, it will be important for the planning of air route networks to analyze this carefully in order to keep a balance between these aspects.

The air passenger traffic demand forecast in Uzbekistan are summarized as shown in **Table 4.3.1**.

Table 4.3.1 Air Passenger Demand Forecast

(million)

Airport	Routes	1996(*)	2000	2005	2010	2015	2020
Tashkent	Int. & CIS	1,037	1,068	1,543	2,032	2,554	3,064
	Dom.	681	786	927	1,079	1,241	1,411
Local	Int. & CIS	140	765	1,165	1,614	2,081	2,606
	Dom.	681	2,287	2,944	3,629	4,332	5,097
Subtotal	Int. & CIS	1,177	1,833	2,708	3,646	4,635	5,670
	Dom.	1,362	3,073	3,871	4,708	5,573	6,508
Total		2,539	4,906	6,579	8,354	10,208	12,178

Note : Passenger volume includes both departure and arrival passengers.

Passenger volume in 1996 is the estimated figure due to lack of the statistic data.

(2) Domestic Air Route Networks

Presently, air route networks of domestic flights consist of 19 routes, 16 routes of which are operated with Tashkent airport. In the air route network planning, it is assumed that one round flight by small type of aircraft should occur every day as a minimum condition for creating an air route between Tashkent and local airports.

The air route networks plan in 2005 and 2020 is shown in **Fig. 4.3.1**. It is expected that domestic air routes will increase to 36 routes in 2020 from the existing 19 routes.

(3) CIS and International Air Route Network

Currently, there are 32 CIS routes, 26 routes of which are provided at Tashkent airport, and 22 international routes originate at Tashkent airport. In 1996, 12% of the CIS and international passengers were handled at local airports. However, in 2020, it is expected that CIS and international passenger traffic from local airports will increase to 46% of the total CIS and international passenger traffic in Uzbekistan. Consequently, CIS and international routes will be opened increasingly between local airports and European countries.

Air route networks plan of CIS and international flight in 2005 and 2020 are shown in **Fig. 4.3.2** to **Fig. 4.3.3**.

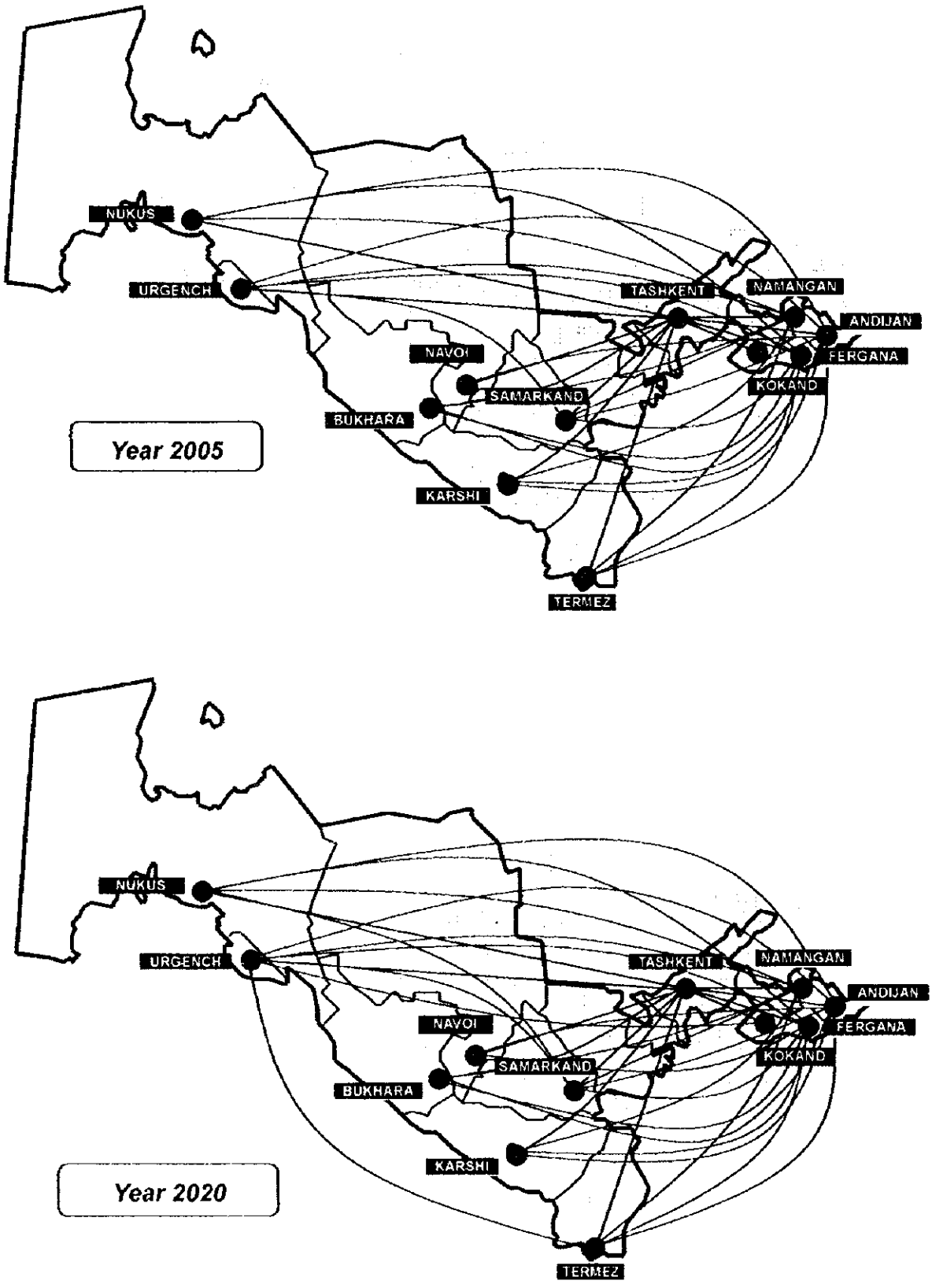


Fig. 4.3.1 Domestic Air Route Network (2005/2020)

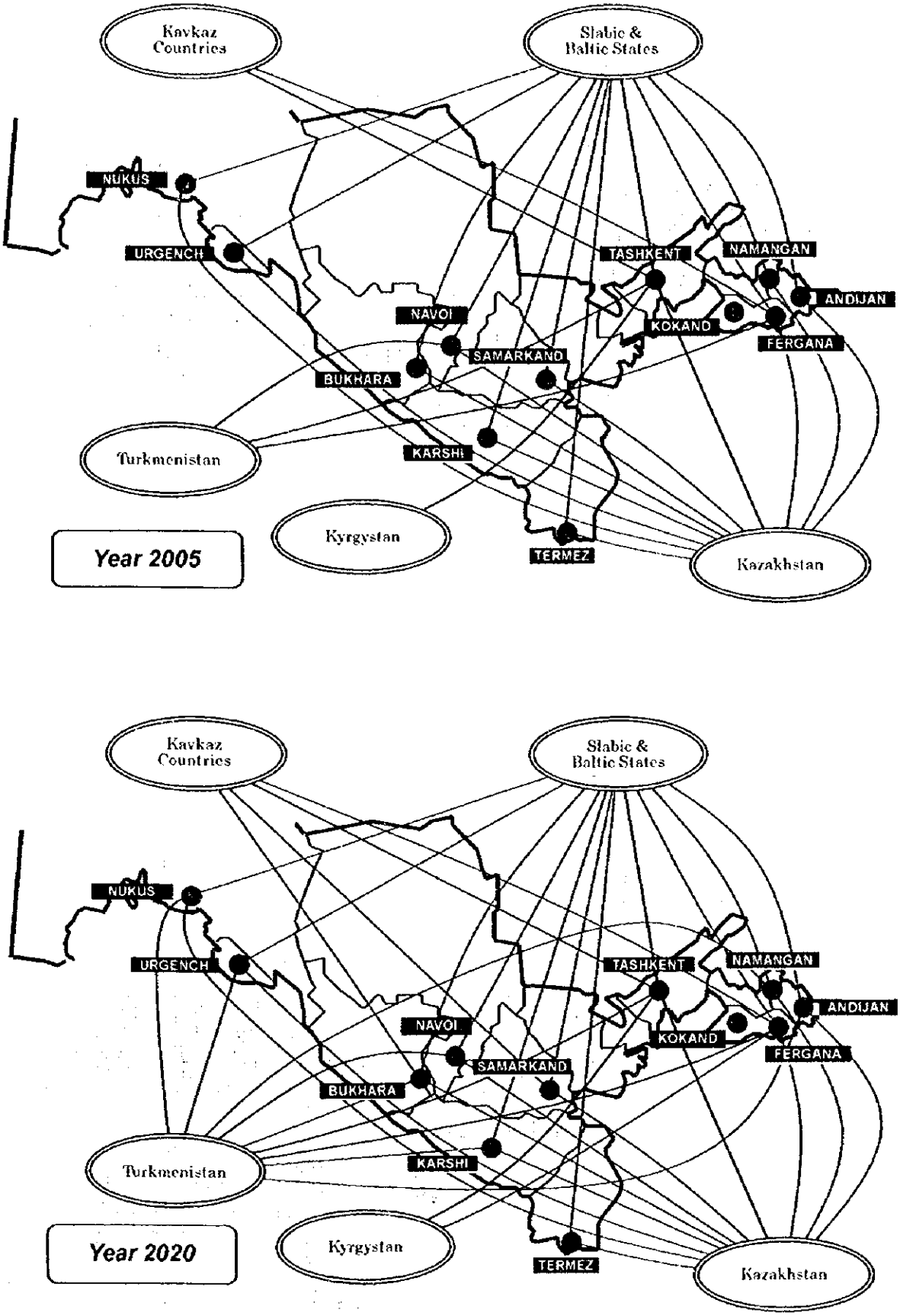
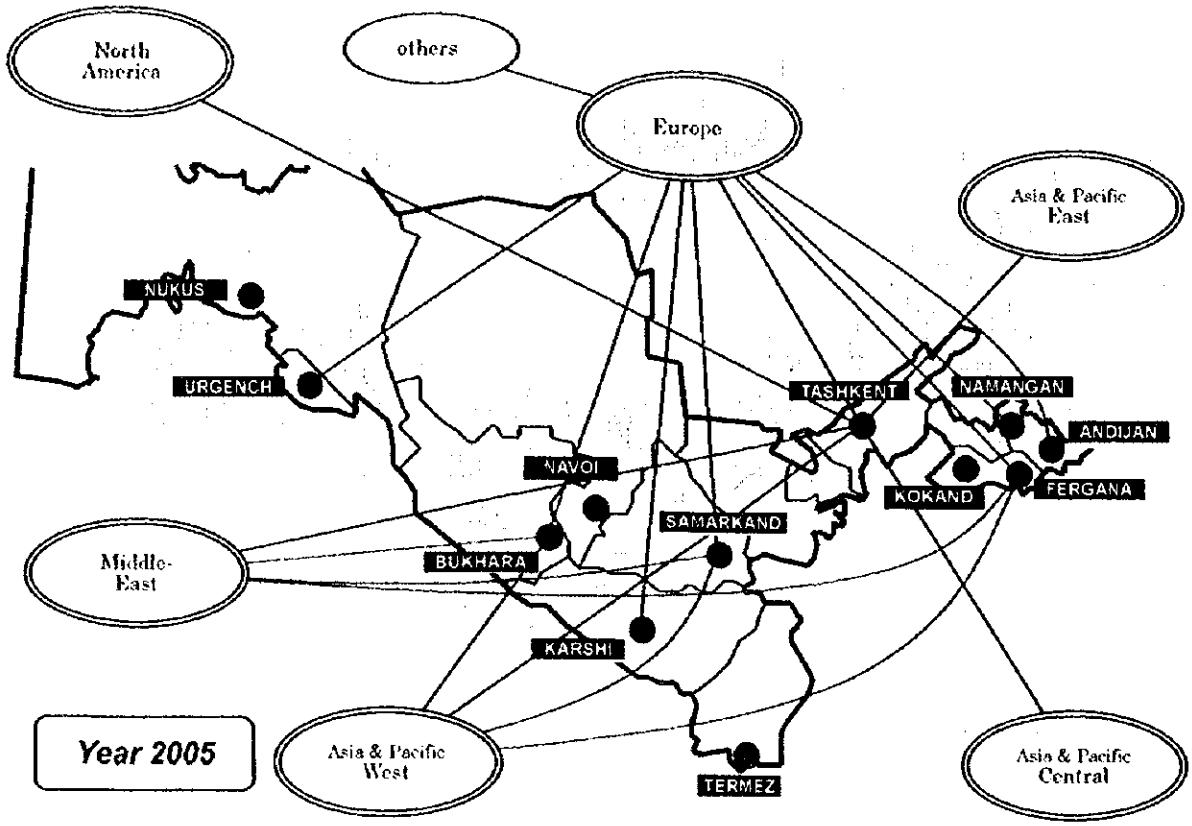


Fig. 4.3.2 CIS Air Route Network (2005/2020)



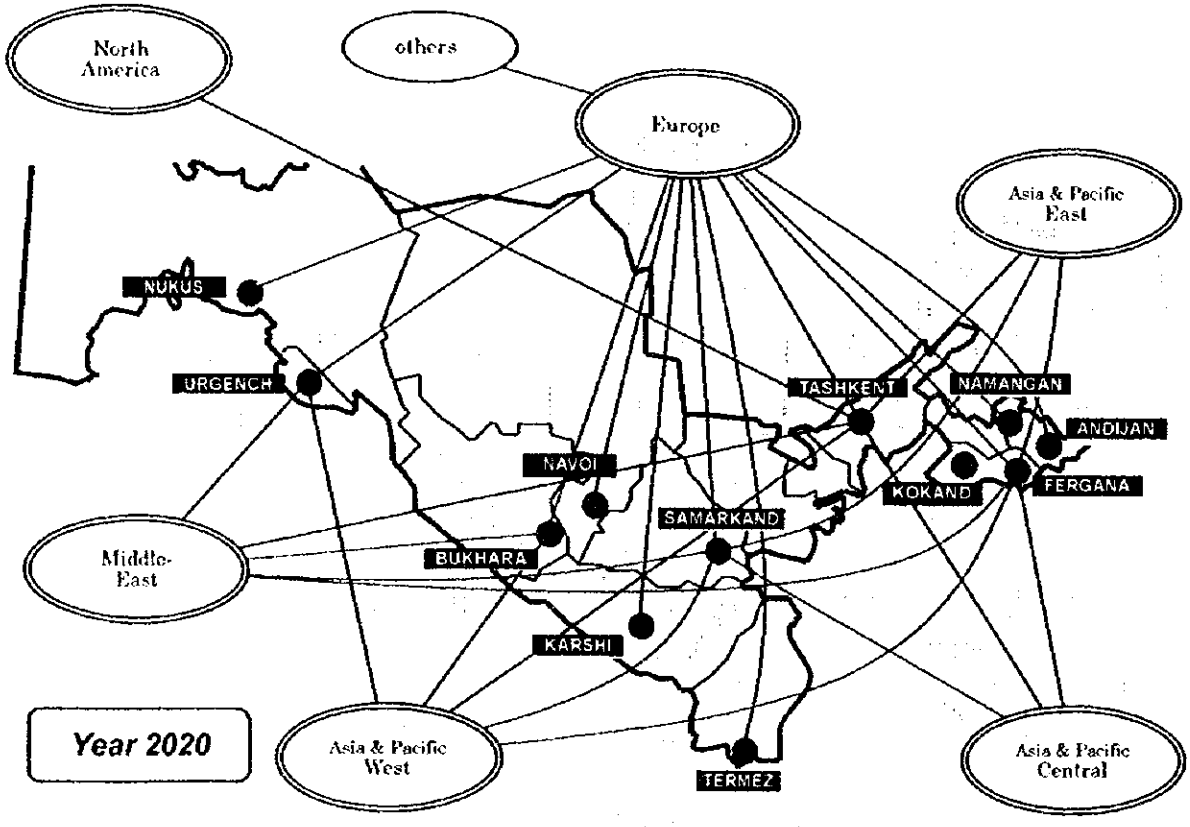


Fig.4.3.3 International Air Route Network (2005/2020)

4.3.3 Category of Airport

Classification of airports is used in some countries to categorize ownership of airports and budgetary allocation for development. In one of the MAC standards, classification of airports are classified into 7 categories based on the runway length in order to provide design standards for aerodrome facilities such as runway, taxiway, and air navigation facilities. Classification of airports in Uzbekistan basically use the same system. On the other hand, according to the AIP of Uzbekistan, three airports, namely, Tashkent, Samarkand and Termez are designated as international airports.

For the Master Planning and for selecting the high priority projects, in accordance with the socio-economic situation of airport hinterland and role of airport, the airports in Uzbekistan are classified into the following three categories.

- **Class I Airport:** Hub airports mainly for international and domestic air transportation in Uzbekistan, serving national economic development;
- **Class II Airport:** Core airports mainly for CIS and domestic air transportation in the area, serving regional economic development;
- **Class III Airport:** Airports mainly for domestic air transportation serving smaller areas than Class II Airports.

(1) Classification of Airports

Twelve (12) airports selected as the study airports among the total of twenty (20) airports as stated in Chapter 3, are classified into the above 3 categories as shown in **Table 4.3.2** based on the following criteria;

a) Class I Airport

Since Tashkent Airport is functioning as the main gateway to Uzbekistan as well as a hub airport for domestic air routes, and will continue to play the same role in the country, it is classified into Class I Airport.

b) Class II Airport

Class II Airport is an airport which has to play a role as a regional core airport, mainly serving CIS and domestic air routes. In addition, according to the growth of the regional economy, the airports will be developed to serve direct international routes.

Considering the geographical position, road distance from Tashkent and population, the territory of Uzbekistan is divided into six (6) areas, as shown in **Fig.4.3.4**, namely, Eastern, Metropolitan, Central, Southern, Western, and North-Western.

The socio-economic indices and future of air traffic demand of each area are shown in **Table 4.3.3** and population distribution and road distance from Tashkent is shown in **Fig. 4.3.5.**

Accordingly, five (5) core airports of each area, namely, Fergana, Samarkand, Termez, Bukhara, Urgench, are all classified as the Class II Airports except Tashkent Airport in the Metropolitan Area.

Fergana airport in the Eastern Area is managed and controlled by the military. Since it is anticipated that its development to cope with increasing civil aviation demand is considered to be restricted due to military activities, Namangan airport is selected as another Class II

Airport in the Eastern Area.

In addition, although the Class II Airport in the North-Western Area is Urgench airport in Khorezm province, Nukus airport is also nominated as a Class II Airport, because Nukus airport is the capital airport of an autonomous body, the Republic of Karakalpakstan in Uzbekistan territory, and socio-economic potentiality of the Republic is almost the same as that of Khorezm province.

c) Class III Airport

Remaining airports other than the Class I and II Airports are to be classified as Class III Airports.

Table 4.3.2 Classification of Airports

Category	Major Function	Name of Airport
Class I	Hub airports mainly for international and domestic air transportation in Uzbekistan, serving national economic development.	Tashkent (New Tashkent)
Class II	Core airports mainly for CIS and domestic air transportation in the area, serving regional economic development.	Fergana, Namangan, Samarkand, Termez, Bukhara, Urgench, Nukus
Class III	Airports mainly for domestic air transportation serving smaller area than Class II Airports.	Andizhan, Kokand, Karshi, Navoi

Table 4.3.3 Socio-Economic Index and Air Traffic Demand in Priority Airport

Class	Area	Airport	Location		Socio-Economy				Facility	Air traffic Demand				Remark
			Province	Road distance from Tashkent (km)	Province Population ('000) (1996)	Industrial Production (bl.sum) (1996)	Consumer Goods Production (bl.sum) (1996)	Trade Turnover (bl.sum) (1996)	Runway Length (m)	Passenger ('000) (1995)	Passenger ('000) (2020)	Cargo (ton) (1995)	Cargo (ton) (2020)	
III	Eastern	Andizhan	Andizhan	362	2,040 (4)	30.3 (5)	20.8 (2)	23.5 (4)	2900	117.4 (4)	1083.7 (3)	46.2	6588	Owned by Military
II		Fergana	Fergana	331	2,500 (2)	64.0 (2)	15.8 (3)	25.0 (3)	2860	104.6 (5)	1219.8 (2)	1857.7 (2)	20910 (2)	Owned by Military
III		Kokand	Fergana	247					1600	47.4	54.2	7.3	180	
II		Namangan	Namangan	302	1,786	14.4	7.4	20.0 (5)	3270	80.6	701.8	433.0 (3)	3520	
I	Metropolitan	Tashkent	c.Tashkent	-	5,903 (1)	128.3 (1)	55.8 (1)	92.3 (1)	4000	1748.6 (1)	4469.2 (1)	7235.0 (1)	59695 (1)	International
II	Central	Samarkand	Samarkand	293	2,489 (3)	16.2	11.0 (4)	25.7 (2)	3100	91.2	953.6 (4)	143.7 (4)	13073 (3)	International
III		Karshi	Kashkardar	445	1,975 (5)	40.4 (4)	5.4	11.0	2900	67.4	505.5	18.9	5217	
II	Southern	Termez	Sukhandary	677	1,582	10.4	4.4	6.4	3000	171.8 (2)	627.1	73.0	3290	International
III	Western	Navoi	Navoi	461	748	40.9 (3)	3.3	5.9	1410	27.8	287.3	2.2	4985	
II		Bukhara	Bukhara	561	1,340	17.1	9.2 (5)	11.5	3000	88.2	728.5 (6)	112.0	11160 (4)	
II	North-Western	Urgench	Khorezm	1,022	1,226	16.2	7.4	7.9	3000	137.0 (3)	873.5 (5)	133.6 (5)	7173 (5)	
II		Nukus	Karakalpak	1,117	1,418	10.8	6.0	7.2	3000	100.0	570.3	35.0	2752	

Dominant index within an area.

* : Figures in ( ) shows the ranking in Uzbekistan on each item.

Fig. 4.3.4 Areas and Classification of Airport in Uzbekistan

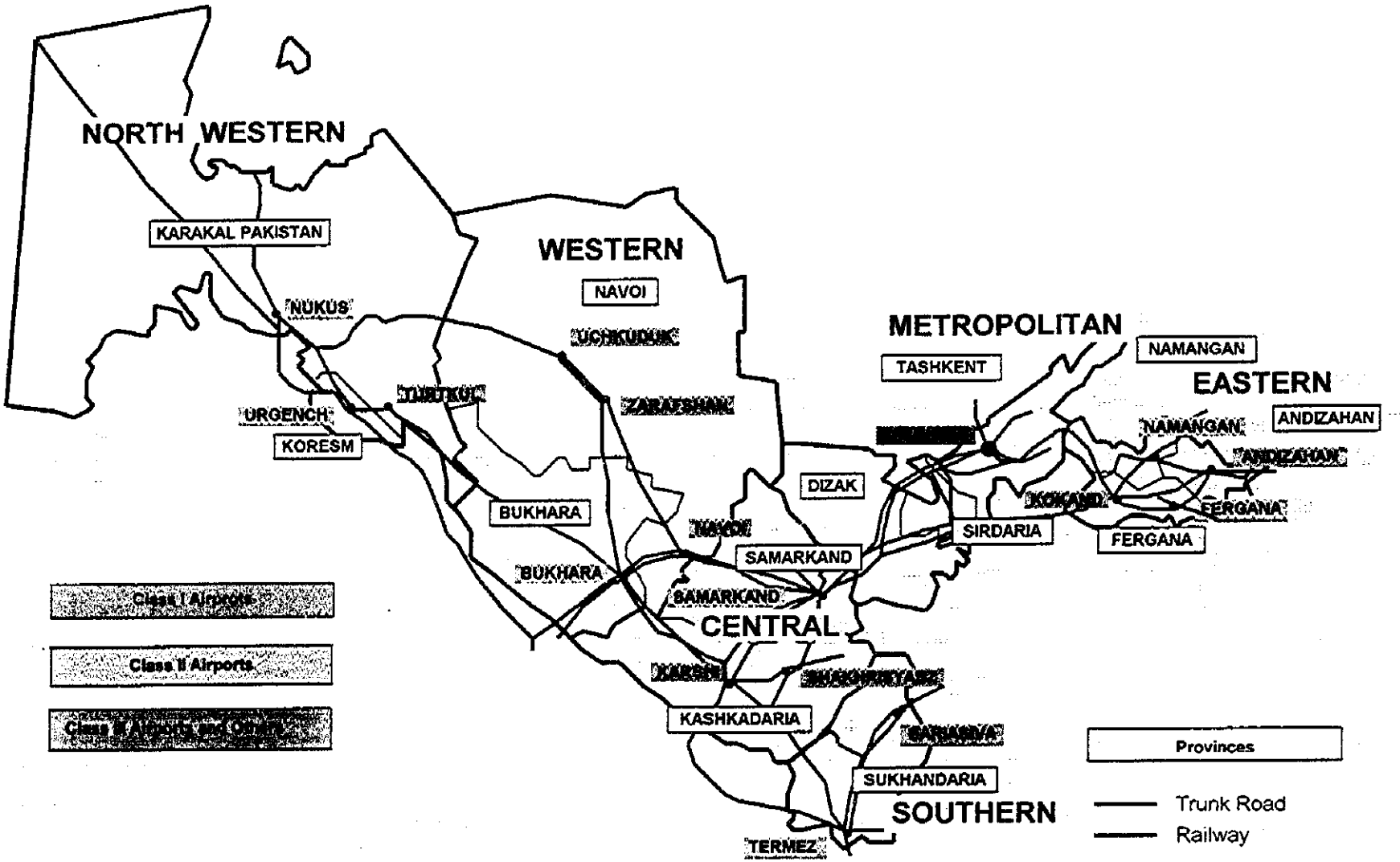


Fig. 4.3.4 Areas and Classification of Airport in Uzbekistan

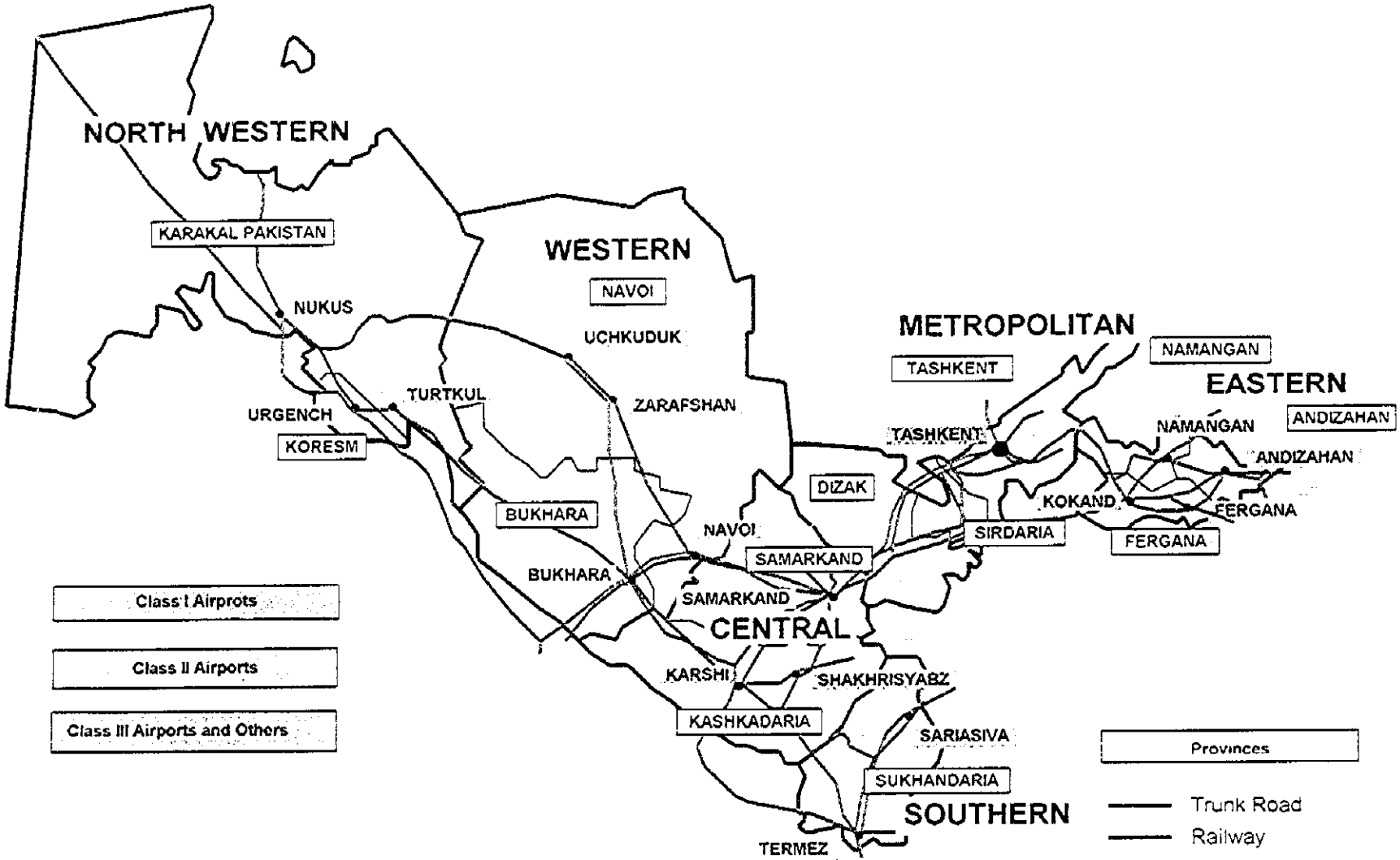
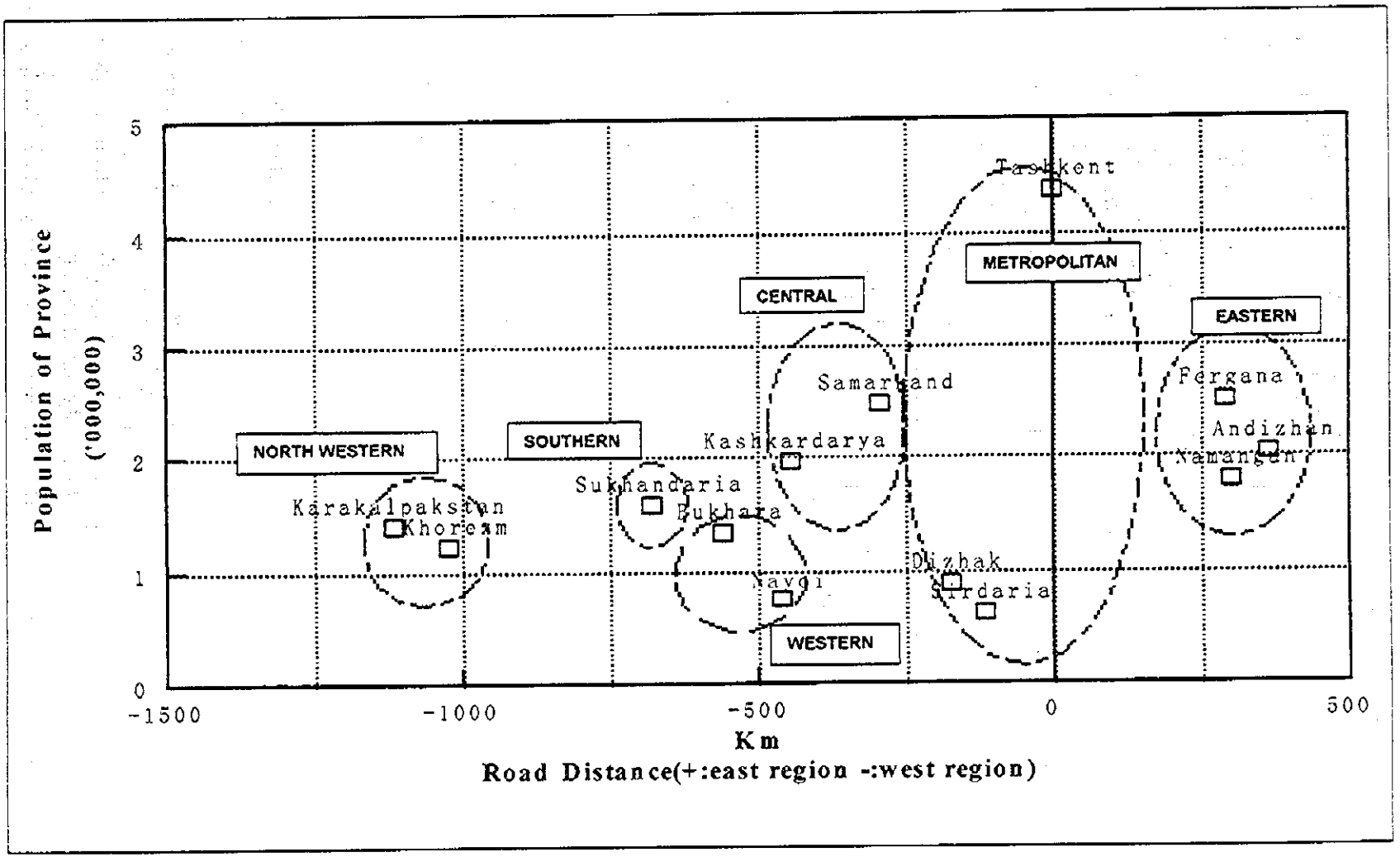


Fig. 4.3.5 Road Distance and Population of Province



4.3.4 Development Strategy by Stage

Airports and air navigation facilities in Uzbekistan have been developed and improved gradually after independence in 1991. However, many such projects have been suspended due to budgetary problems, therefore, a large part of the facilities are seriously superannuated.

Runway pavement improvement and upgrading of air navigation facilities were completed at Tashkent airport in 1996, but expansion work of the existing passenger terminal building was suspended. Furthermore, although modernization and improvement of three local airports and air navigation facilities are being carried out with financial assistance from the Overseas Economic Cooperation Fund of Japan, airport facilities of the remaining local airports are superannuated.

To implement improvement works of air transportation facilities in Uzbekistan including the development of the capital hub airport in Tashkent, a huge amount of financial investment will be required. In addition, it is considered that modernization of the air navigation systems to the level of FANS, strengthening of the air carrier sector, including aircraft maintenance, as well as training of flight crews and mechanics, will also need considerable investment.

Therefore, in the course of preparation of the Master plan up to 2020, due consideration is paid to points such as a realistic upgrade planning and appropriate investment allocation, by dividing development of air transport facilities into the following stages:

(1) First Stage (~2005)

Firstly, facilities which contribute to completing the priority domestic projects and obtain early retrieval of economic activities shall be developed in this stage.

In other words, development of infrastructure, promoting movement into a market economy is an urgent issue, and development of a hub airport in Uzbekistan or in Central Asia shall be the first priority project.

Secondly, some local airports in the Class II category, which are a core of the region, have broad air traffic demand and can enjoy the merits from aviation activities, shall also be developed at this stage. Traffic demand of such airports will increase due to the expected recovery of domestic economic activity after 1997.

As it is important, and takes time for training operational staff, as well as development of hard and soft operational systems, an upbringing program shall be provided in the first stage.

(2) Second Stage (2006~2010)

At this stage, activated economic and domestic demand is expected to bring an increase in air traffic demand. Facilities shall therefore be improved taking into account safety, amenity and convenience for users.

Regarding the capital airport, high priority shall be given to the development of a new capital airport in this stage due to the following reasons:

- Difficulty of runway extension to accommodate operation of large aircraft, such as B-747 for international flights from/to the capital airport;
- Increased impact due to aircraft noise on the surrounding area of the existing Tashkent airport,

- Difficulty of proper development of the urban area of Tashkent city due to the existence of the existing airport,

As for Class II local airports, facilities which are necessary for regional and international flights shall be developed at this stage.

(3) Third Stage (2011~2015)

The latent air traffic demand will gradually increase with facility development and system improvement completed before 2010. As the aviation industries of Uzbekistan will be strengthened by international competition, local trunk-line airports shall be improved according to international standards.

(4) Fourth Stage (2016~2020)

The long-term master plan shall be completed at this stage, and facilities shall be developed for balanced national and regional development.

4.3.5 Planning Criteria

(1) Applicable Standards of Airport Planning

Aerodrome facilities such as runways and taxiways, and air navigation facilities such as airfield lighting and radio navigational aids in Uzbekistan have been planned and designed based on the MAK standards.

Recently, NAC has begun to adopt ICAO standards, especially regulations related to air traffic control (ATC) services.

Comparisons of the major items between MAK and ICAO standards are shown in **Table 4.3.4**.

Table 4.3.4 Comparison of Major Items between MAK and ICAO

Item	ICAO	MAK
Code Element-1 Aeroplane Reference Field Length	4 categories Code 1 - 800m Code 2 800 – 1200 m Code 3 1200 – 1800 m Code 4 1800 m -	6 categories A 3,200 m B 2,600 m B 1,800 m Г 1,300 m Д 1,000 m E 500 m
Code Element-2 Aeroplane	5 categories by wing span and wheel track. Wing Span Wheel Track A -15 m - 4.5 m B 15-24 m 4.5-6 m C 15-24 m 4.5-6 m D 36-52 m 9-14m E 36-52 m 9-14m	5 categories by wing span and wheel track. Wing Span Wheel Track Code 1 -24 m -4 m Code 2 24-32 m 4-6 m Code 3 24-32 m 6-9 m Code 4 32-42 m 9-10.5 m Code 5 32-42 m 10.5-14m
Runway Width	By Code Elements-1& -2 Code 4 C/D/E 45 m Code 3 D 45 m Code 3 C 30 m	By Code Element-1 A, Б 45 m В 42 m Г 35 m
Runway Longitudinal Slope	By Code Element-1 Code 3 & 4 1 % Code 1 & 2 2 %	By Code Element-1 A-Д 1 % E 1.7 %

Runway Strip	By Code Element-1 Length : Code 2, 3 & 4 60 m at the both ends Width (Instrument Runway) Code 3, 4 2 x 150 m Code 1, 2 2 x 75 m	By Code Element-1 Length : A, B, B, Г, Д 150 m at the both runway ends E 120 m at the both runway ends. Width (Instrument Runway) A, B, B, Г 2 x 150 m Д, E 2 x 75 m
Taxiway Width	By Code Element-2 E 23 m D 18 m C 15 m	By Code Element-1 A 22.5 m B 19 m B 17 m Г 13 m
Clearance of Taxiway to Obstacles	By Code Element-2 E 47.5 m D 40.5 m C 26 m	By Code Element-1 A 47. 5 m B, B 38 m Г, Д 29.5 m
Radio Navaids	ILS consists of LLZ, GP, Inner Marker, Middle Marker and Outer Marker.	ILS consists of LLZ, GP, Inner Marker, and Outer Marker. SP Type ILS is also adopted. (SP type ILS is the former USSR system)
Meteorological Facilities	RVR Cat-I runway : 2 sets Cat-II,III runway : 3 sets	RVR Number of RVR depends on the runway length. More than 2,000 m long Cat-I runway needs 3 sets of RVR.
Airfield Lighting	Aerodrome Beacon required Overrun light not required.	Aerodrome Beacon not required. Overrun lights required

As shown in **Table 4.3.4**, classification of aerodrome and aeroplane are basically the same for both sets of regulations, and there are no major differences in the basic planning elements of the runway and taxiway.

Since the priority airports will play a role as core airports in the country, as well as the respective region, and since they are also expected to be used for international flights, their facilities should be upgraded to meet with ICAO standards. Where ICAO regulations are not sufficient, regulations of the Civil Aviation Bureau of Japan (JCAB), or the Federal Aviation Administration (FAA) of the United States of America should apply.

(2) Perspective of Future Aircraft

Presently, the main fleet for domestic flights consists of Yak-40 and An-24. They are more than 20 years old and will be replaced by IL-114 and RJ-85, having a seat capacity of between 60 – 90 passengers.

Current CIS routes are served mainly by Tu-154. In future, it is anticipated that the RJ-85 and B737 class aircraft will operate the short distance routes between neighboring CIS countries, and be used for medium distance routes and large demand routes such as Moscow will be served by western-made aircraft such as A310, in addition to the present fleet of Tu-154 and IL-86.

Flights on international routes are presently served by A310, B-767, Il-92 and Tu-154.

Western-made aircraft such as A-310 and B-767 introduced recently, are expected to be the main fleet on future international routes. Moreover, B-747, at present, one of the principal aircraft for international routes in western countries, is expected to operate between Tashkent airport and certain European countries.

The current fleet composition and future possible fleet for air transportation in Uzbekistan are shown in **Table 4.3.5**.

Table 4.3.5 Current and Future Fleet Composition

ICAO Aircraft Code	Aircraft	Wing Span (m)	Seats	Max. Take-off Weight (ton)	Haul Range (km)	Required T/O RWY Length (m)	Min. Annual Demand ('000) (*)	Planned Aircraft (**)			Present Flight
								Dom.	CIS	Int.	
C (Small)	IL-114	30.0	64	22.7	1,000	1,550	33	O	O		
	YAK-40	25.0	39	16.5	1,700	700	20	O	O		Dom./CIS
	YAK-42	34.9	112	56.5	1,740	2,200	57		O		CIS
	AN-24	29.2	39	21.0	2,000	1,720	20	O			Dom.
	TU-334	29.8	121	43.6	1,720	2,200	62		O		
	TU-134	29.0	76	47.0	2,200	2,180	39		O		CIS
	RJ-85	26.2	90	44.0	2,960	1,385	46	O	O		
	B-737	29.0	126	62.8	2,315	2,315	64		O		CIS
D (Med.)	TU-204	42.0	194	93.5	2,900	2,500	99		O		
	IL-86	48.1	292	208.0	3,600	2,600	149		O		CIS
	TU-154	37.6	173	100.0	3,700	2,500	88	O	O	O	CIS/Int.
	IL-62	43.2	157	162.0	3,800	3,250	80		O	O	Int.
	IL-76	50.5	-	190.0	3,800	1,700	-		O	O	Freighter
	AN-12	38.0	-	61.0	5,700	700	-		O	O	Freighter
	B-757	38.1	186	113.4	7,070	2,130	95		O	O	CIS
	A-310	43.9	190	142.0	9,600	2,220	97		O	O	CIS/Int.
	B-767	47.6	250	156.5	10,670	2,469	128			O	Int.
E (Large)	B-777	60.9	375	135.6	7,350	2,225	192			O	
	IL-96	57.7	268	216.0	7,500	2,600	137			O	
	B-747	64.3	353	394.6	13,330	3,490	180			O	

(*) : "Minimum Annual Demand" means that passengers demand in case of at least one arrival and one departure per day occurs, and is estimated by the following equation:
= (Seat capacity) x (Load factor =70%) x (365 days) x 2

(**) : Planned Aircraft is the possible type of aircraft to be operated on the domestic, CIS or international routes.

Existing Route Distance:

	Minimum	Maximum
International	2,067	11,530
CIS	640	4,550
Domestic	250	1,490

Note: Classification of aircraft is based on ICAO regulations.

(3) Current Air Navigation Systems and Outlook on the Introduction of FANS

It has been said that recent air traffic is rapidly increasing all over the world and this tendency will last into the 21st century. The present air navigation system using radio navigation facilities, installed on the ground was established in the 1950s.

However, under the circumstances that the performance of aircraft and the environment of air traffic has changed drastically, the present system is expected to be unable to deal with the large demand for air traffic in the future.

Therefore, in the ICAO, a study of the new air navigation systems utilizing up-to-date technology, has been continuing regularly since 1983. At the ICAO Tenth Air Navigation Conference in 1991, the conception of Future Air Navigation Systems (FANS) was discussed. This enables the global provision for Air Traffic Services, by means of utilizing up-to-date technology of satellite and data links, etc.

Moreover, the guidelines for realizing and transferring to the conception of FANS from the present system, were defined at Phase II -ICAO Special Committee for the Monitoring and Co-ordination of Development, and Transition Planning for the Future Air Navigation Systems in 1993.

The elements of air navigation systems supporting Air Traffic Control are "Communication", "Navigation" and "Surveillance" and are usually known by the acronym "CNS".

The current CNS system has the following deficiencies:

- limit of transmission of radio waves;
- difficulty in developing a world-wide system; and
- limit of service for voice communication,

In order to solve the above situation, the FANS Special Committee of ICAO proposed introduction of a new system of CNS to actualize global Air Traffic Management.

Accordingly, the related countries and international organizations are making efforts to realize the conception of FANS.

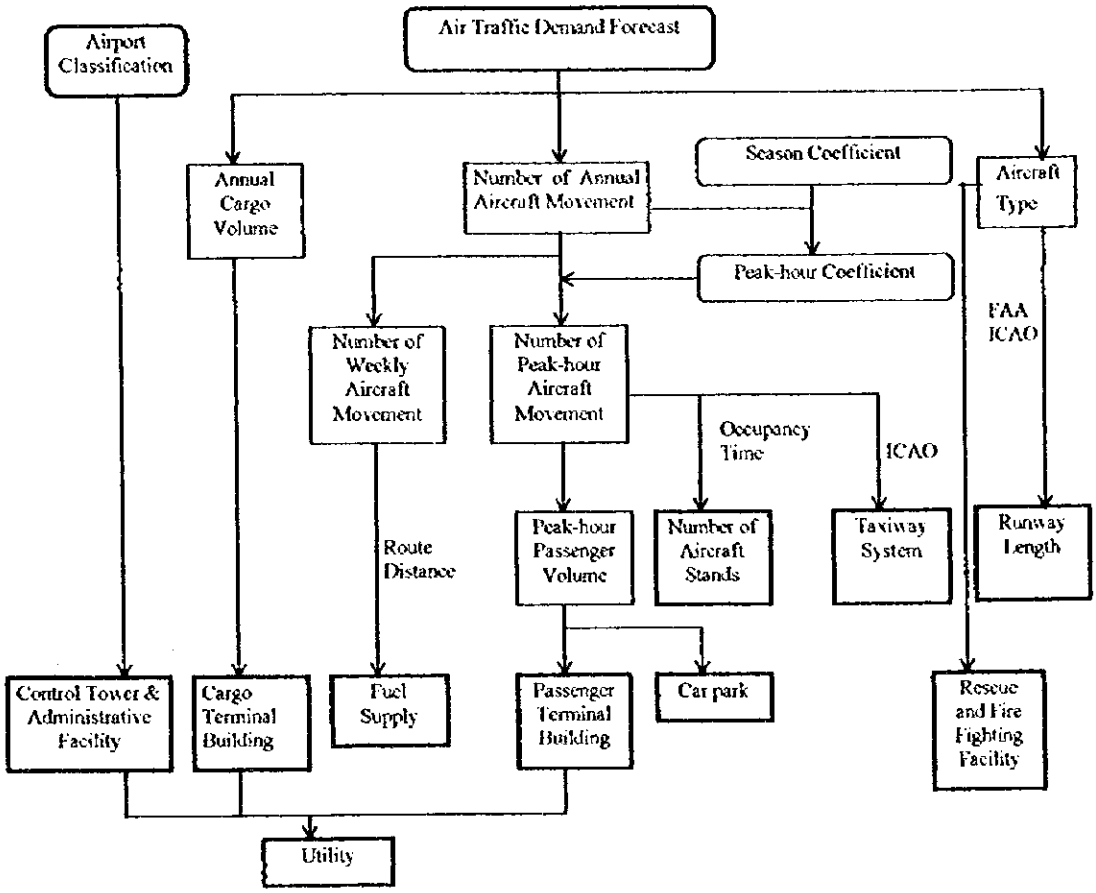
At present, according to the tendency of ICAO, the development of FANS in the United States of America is at the practical experimental stage. In Japan, Multi-functional Transport Satellite I (MT-SAT I) will be launched in 1999 and the MT-SAT II will follow in 2004. In Europe, the construction of the next generation of Air Traffic Services System on the basis of the FANS conception, is being promoted under the European Satellite Navigation Program.

4.4 Facility Requirement Establishment

4.4.1 Procedures of Facility Requirement Establishment

Based on the air traffic demand forecasted in the Chapter 4.2, the planning requirements of each airport facility are determined in accordance with the procedure shown in **Fig. 4.4.1**.

Fig. 4.4.1 Procedures of Facility Requirement Establishment



4.4.2 Planning Parameters

(1) Design Aircraft

Considering the results of the future air traffic demand and perspective of future aircraft fleet, type of aircraft to be used for establishment of facility requirements and planning of airport facilities is determined as shown in **Table 4.4.1**.

Table 4.4.1 Classification of Aircraft for Planning Purpose

Category	Aircraft	Seats		Max. Weight (ton)		T/O Runway Length		Wing Span		Overall Length	
		A	B	A	B	A	B	A	B	A	B
[Domestic]											
Mini Plane	YAK-40	39	50	17	25	700	1,550	25	30	20	27
	AN-24	39		21		1,720		29		24	
	IL-114	64		23		1,550		30		27	
Small Jet	RJ-85	90	100	44	45	1,355	1,385	27	30	29	29
Med. Jet	TU-154	173	200	100	100	2,500	2,500	38	40	48	48
[CIS]											
Mini Plane	YAK-40	39	50	17	25	700	1,550	25	30	20	27
	AN-24	39		21		1,720		29		24	
	IL-114	64		23		1,550		30		27	
Small Jet	YAK-40	39	100	17	60	700	2,200	25	30	20	38
	YAK-42	112		52		2,200		35		37	
	TU-134	76		47		2,180		29		38	
	RJ-85	90		44		1,385		27		29	
	TU-334	121		41		2,200		30		33	
	B-737	126		57		2,027		29		37	
Medium Jet	IL-62	157	200	162	150	3,250	2,530	44	50	54	60
	TU-154	173		100		2,500		38		48	
	A-310	185		142		2,130		39		48	
	TU-204	194		94		2,220		44		47	
	IL-86	292		208		2,500		42		33	
								49		37	
Large Jet	IL-96	268	350	216	230	2,600	2,600	58	65	56	61
	B-777	375		230		2,225		61		64	
Freighter	IL-76			190	190	1,700	1,700	51	55	47	47
	AN-12			61		700		38		34	
[International]											
Medium Jet	IL-62	157	200	162	160 150	3,250	2,469 2,220 (3)	44	50	54	55
	TU-154	173		100		2,500		38		48	
	B-757	186		113		2,130		39		48	
	A-310	190		142		2,220		44		47	
	B-767	250		157		2,469		48		55	
Large Jet	IL-96	268	350	216	395	2,600	3,490	58	65	56	71
	B-747	353		395		3,490		65		71	
	B-777	375		230		2,225		61		64	
Freighter	IL-76	-		190	190	1,700	1,700	51	55	47	47
	AN-12	-		61		700		38		34	

Note : 1) Take-off runway length : Sea level, runway slope 0%, temperature 15 °C
2) A : Actual dimension, B : Dimension for planning purpose
3) Take-off Runway Length of A310 : ISA+15 °C

(1) Seasonal Coefficient

Capacity requirements of airport facilities basically depend on the daily aircraft movements and passengers. Since the daily aircraft movements and passenger volume at an airport are usually not uniform through the seasons, it is necessary to estimate the number of landings, and take-offs and passengers in the busiest season.

As shown in Table 4.4.2, Season Coefficient for the Master Planning purpose is estimated at 1.2, based on the traffic records in 1996 of Tashkent Airport, using the following equations;

Table 4.4.2 Season Coefficient

Items	Domestic	CIS	International	Average
[Landing and Take-off (Aircraft Movements)]				
2nd Busiest Month	1,229	343	277	
Monthly Average	1,045	289	254	
Season Coefficient	**1.18**	**1.19**	**1.09**	**1.2**
[Passengers]				
2nd Busiest Month	30,566	35,154	20,164	
Monthly Average	27,386	25,999	18,178	
Season Coefficient	**1.12**	**1.35**	**1.11**	**1.2**

- Season Coefficient
  = (Landing and Take-off or Passengers on the 2nd Busiest Month) / (Monthly Average of Landing and Take-off or Passengers)

With the Seasonal Coefficient, number of landings and take-offs or passengers on the peak day (the busiest day) is obtained respectively, using the following equations:

- Number of Landing and Take-off on the Peak day
  = {(Weekly landing and take-off) / (7 days)} x (Season Coefficient = 1.2)
- Number of Passengers on the Peak Day
  = {(Annual passengers) / (365 days) } x (Season Coefficient = 1.2)

(2) Peak-Hour Coefficient

Capacity requirements in airport facility planning is basically determined by the peak-hour aircraft movements or passengers. Peak-hour aircraft movements or passengers are calculated using the Peak-hour Coefficient.

The Peak-hour Coefficient are calculated by the following equation:

- Peak-hour Coefficient
  = (Peak-hour aircraft movements or passengers) / (Daily aircraft movements or passengers)

Generally, the larger the number of aircraft movements or passengers is, the smaller the Peak-hour Coefficient is. The Peak-hour Coefficients is calculated by two types of equations, namely, the JCAB regulations and the analyzed correlation equation from the past flight records are shown in **Table 4.4.3**.

Table 4.4.3 Equation for Peak-hour Coefficient

Route	Uzbekistan	JCAB
International	Y = 0.15 / X + 0.178	Y = 1.05 / X + 0.114
CIS	Y = 0.91 / X + 0.118	
Domestic	Y = 1.48 / X + 0.049	Y = 1.51 / X + 0.115 (X<100) Y = 6.61 / X + 0.064 (X>100)

Y = Peak-hour Coefficient, X = Daily Aircraft Movement

The correlation analyses between the Peak-hour Coefficient and daily aircraft movements at twelve (12) airports and Tashkent airport are shown in **Tables** through **4.4.4** to **4.4.6**.

The result of the analysis shows almost the same characteristics as that of the equations established by JCAB.

But, compared with the Peak-hour Coefficient estimated by using the equation established by JCAB, this case is slightly higher than that of Uzbekistan. JCAB's equation is adopted for the planning purpose of the Study, as is offers some margin for the facility planning capacity.

Table 4.4.4 Peak-hour Coefficient Analysis of Domestic Routes

Airport	Peak-hour Movements (As of Feb 1997)	Daily Movements (As of Feb 1997)	Peak-hour Coefficient	P.H Coefficient by JCAB Equation (*)
Tashkent	7	67	0.104	0.138
Namangan	2	5	0.400	0.417
Andizhan	2	10	0.200	0.266
Fergana	2	5	0.400	0.417
Kokand	2	2	1.000	0.870
Samarkand	1	4	0.250	0.493
Termez	2	11	0.182	0.252
Karshi	2	6	0.333	0.367
Bukhara	3	8	0.375	0.304
Navoi	1	4	0.250	0.493
Urgench	2	9	0.222	0.283
Nukus	1	3	0.333	0.618

(*) : Y = 1.51 / X + 0.115 (X<100), Y = 6.61 / X + 0.064 (X>100)

Table 4.4.5 Peak-hour Coefficient Analysis of CIS Routes(Tashkent)

Airport	Peak-hour Movements (As of Feb 1997)	Daily Movements (As of Feb 1997)	Peak-hour Coefficient	P.H Coefficient by JCAB Equation (*)
Monday	3	19	0.158	0.169
Tuesday	3	17	0.176	0.178
Wednesday	4	18	0.222	0.172
Thursday	2	14	0.143	0.189
Friday	2	9	0.222	0.231
Saturday	3	16	0.188	0.180
Sunday	3	23	0.130	0.160

(*) : Y = 1.05 / X + 0.114

Table 4.4.6 Peak-hour Coefficient Analysis of International Routes (Tashkent)

Airport	Peak-hour Movements (As of Feb 1997)	Daily Movements (As of Feb 1997)	Peak-hour Coefficient	P.H Coefficient by JCAB Equation (*)
Monday	2	10	0.200	0.219
Tuesday	1	7	0.143	0.264
Wednesday	2	13	0.154	0.195
Thursday	1	6	0.167	0.289
Friday	2	10	0.200	0.219
Saturday	2	9	0.222	0.231
Sunday	2	7	0.286	0.264

(*) : Y = 1.05 /X + 0.114

(4) Load Factor

The load factor is a ratio of the number of embarking passengers against seat capacity, and assumed to be 70% for planning purposes.

4.4.3 Planning Requirement of Airfield Facilities

(1) Runway Length

Required runway length is planned by taking into account such factors as the aircraft to be operated, reference temperature, altitude of airport and runway longitudinal slope. Required runway length of each airport is calculated based on ICAO and FAA rules as shown in **Table 4.4.7** using the following design aircraft.

- Mini Plane IL-114 (64 seats)
- Small Jet B-737 (126 seats)
- Medium Jet B-767 (250 seats) /A310 (190 seats)
- Large Jet B-747 (353 seats)

Table 4.4.7 Required Runway Length of Each Airport

Airport	Type (*)	Aircraft	Site Conditions			Runway Length (m)		
			Elevation (m)	Ref. Temp. (°C)	Slope (%)	Existing	Required	Extension
Tashkent	LJ	B747-400	431	29	0.39	4,000	4,400	400
New Tashkent	LJ	B747-400	350	29	0.2	-	4,300	-
Namangan New Runway	MJ	B767-300	519	(35)	1.58 1.00	3,270	3,400 3,300	130
Andizhan	MJ	B767-300	475	38	0.17	2,900	3,000	100
Fergana	MJ	B767-300	625	35	1.40 1.00	2,860	3,400 3,300	540 440
Kokand	MP	IL-114	500	34	0.25	1,600	2,200	600
Samarkand	MJ	B767-300	670	36	0.42	3,100	3,100	-
Termez	MJ	B767-300	313	38	0.14	3,000	3,000	-
Karshi	MJ	B767-300	374	(35)	0.10	2,900	3,000	100
Bukhara	MJ	B767-300	229	35	0.17	3,000	3,100	100
Navoi	MJ	B767-300	347	(35)	0.12	1,410	3,100	1,690
Urgench	MJ	B767-300	97	(35)	0.00	3,000	3,000	-
Nukus	MJ	B767-300	76	(35)	0.03	3,000	3,000	-

(*) : LJ = Large Jet, MJ = Medium Jet, MP = Mini-Plane

(2) Taxiway System

Requirements of the taxiway system are summarized as shown in **Table 4.4.8**, by using the regulations of the ICAO Airport Planning Manual and the following criteria:

a) Parallel Taxiway

Parallel taxiways should be provided when any one of the following criteria is forecast to be reached within five years;

- There are four instrument approaches (or eight operations, including landings and take-off during the normal peak hour.
- Annual operational total is more than 50,000
- The normal peak hour itinerant operations are 20
- The hourly total (itinerant plus local) operations are 30

b) Exit Taxiways

In accordance with ICAO Airport Planning Manual, exit taxiway should be provided at both runway ends and middle of the runway. If demand is forecast to exceed 40% of the runway capacity within 5 years, additional exit taxiways should be planned.

c) Rapid Exit Taxiways

Rapid exit taxiways should be provided when the peak hour traffic density is approximately more than 25 operations including landing and take-off.

Table 4.4.8 Requirement of Taxiway System

Airport	Aircraft Movement		Parallel		Exit		Rapid Exit
	Ann.('000)	P.H	Existing	Plan	Existing	Plan	
Tashkent	44.4	20	Yes	Required	5	5 or more	Not req.
Namangan	12.8	8	Yes	Required	3	3 or more	Not req.
Andizhan	14.3	9	Yes	Required	7	3 or more	Not req.
Fergana	15.6	9	Yes	Required	4	3 or more	Not req.
Kokand	1.6	2	Yes		3	1 or more	Not req.
Samarkand	13.2	8	Yes	Required	4	3 or more	Not req.
Termez	8.4	6	Yes		2	1 or more	Not req.
Karshi	8.2	6	Yes		4	1 or more	Not req.
Bukhara	9.1	7	Yes		2	1 or more	Not req.
Navoi	5.2	5	No		2	1 or more	Not req.
Urgench	11.0	8	Yes	Required	3	3 or more	Not req.
Nukus	8.4	6	Yes		3	1 or more	Not req.

Note : P.H = Peak hour aircraft movement

(3) Turning Pads

For a runway without a parallel taxiway, turning pads should be provided at the runway ends, enlarging to the apron side. The runway operated by medium jets should have turning pads with the dimensions of 65 m in width and 65 m in length.

(4) Other Facilities

Other design criteria for aircraft movement areas are summarized in **Table 4.4.9** in accordance with ICAO regulations.

Table 4.4.9 Design Criteria of Airfield Facilities

(unit: m)

Items		Mini Plane	Small Jet	Med. Jet	Large Jet
Runway	ICAO Code	3C	4C	4D	4E
	Minimum Width	30	45	45	45
	Shoulder Width	5	7.5	7.5	7.5
Runway Strip	Length	Runway Length + 2 x 60 m			
	Width	300	300	300	300
Taxiway	Minimum Width	18	23	23	23
	Shoulder Width	3.5	10	7.5	10.5
	Total Width	25	25	38	44
Minimum Separation	Parallel Runways	210	210	210	210
	RWY & TWY	168	176	176	182.5
	TWY Center & objects	26	26	40.5	47.5
I.L.Z Site	Distance from RWY end	450 (MAK Standards)			

4.4.4 Planning Requirement of Terminal Area Facilities

(1) Apron

a) Passenger Loading Apron

Required number of parking stands for passenger loading/unloading is obtained by applying the following equation to each type of forecast aircraft.

- Number of Stands = (Peak Hour Flights) x A x (B/60 min.) + C
  where, A : weighted arrival ratio

B : stands occupancy time (minutes)
C : number of reserve parking stands

Weighted arrival ratio is a rate between the number of arrival and departure flights. Considering that the ratio calculated from the timetable at twelve airports is 0.5 – 0.7, this ratio is assumed to be 0.6 for planning purpose.

Stand occupancy time is adopted as shown in **Table 4.4.10,** by taking into account the actual situation and other regulations.

Reserve parking stands shall be one (1) for every ten (10) stands of maximum aircraft type.

Table 4.4.10 Stands Occupancy Time

			MP	SJ	MJ	LJ
Uzbekistan	Int.	Tashkent			480	
	CIS	Tashkent		78	263	
	Dom.	Tashkent	167	68		
		Local	32	35		
ICAO	Int.	Turnaround			60-120	120-180
	Dom.	Turnaround		45	50-60	60
		Through		25	45-60	
JCAB	Int.			105	105	115
	Dom.		50	60	75	75
Adopted Parameter for Planning	Int.	Tashkent			210	230
		Local			105	115
	CIS	Tashkent	100	120	180	200
		Local	50	60	90	100
	Dom.	Tashkent	100	120	150	
		Local	50	60	75	

Note : LJ = Large Jet, MJ = Medium Jet, SJ = Small Jet, MP = Mini Plane

b) Cargo Loading Stands

Required number of cargo loading stands are determined using the following formula:

- Number of Cargo Loading Apron
  = (Number of Freighter Movements on Peak Day) x 0.5

(2) Passenger Terminal Building

Required floor area of passenger terminal building is calculated by using the following equation:

- Required Floor Area
  = (Peak-Hour Passengers) x (Unit Floor Area Requirement per Passenger)
- Peak-Hour Passengers (departure + arrival)
  = (Peak-Hour Aircraft Movements by Type of Aircraft) x (Number of Seats) x (Load Factor = 70%)
- Unit Floor Area Requirement
  Taking the study for three (3) airports project into account, unit floor area requirement is assumed as follows:
  - International and CIS passengers 15 m^2/peak-hour passenger
  - Domestic passengers 12 m^2/peak-hour passenger

During the Field Survey, data available related to floor area of the terminal building and its handling capacity was only at Karshi and Nukus airport. From this data, unit floor area is

12 m^2/passenger (area = 2,400 m^2, capacity = 200 passengers/hour)for Karshi airport, and 11 m^2/passenger (area = 2,200 m^2, capacity = 200 passengers/hour) for Nukus airport.

(3) Cargo Terminal Building

The floor area of the existing cargo terminal building and cargo handling volume at each of the airports are as shown in **Table 4.4.11**. Handling volume per unit floor area was 2.1 tons/m^2 – 5.4 tons/m^2 in 1990.

In accordance with the JCAB regulations, required floor area for cargo terminal building is determined by using the following equation:

- Required Floor Area
  = (Annual Cargo Volume) / (Y)
  where, Y : handling cargo volume per unit floor area (tons/ m^2)
  = 0.0096 X 0.77 (500 < X < 10,000)
  = 2.201 lnX – 8.78 (10,000 < X < 50,000)
  X: Annual cargo volume (tons)

As holding time of international and CIS cargo at airports is generally longer than that of domestic cargo, "Y" is 40% of the figure obtained from above formula. In the case of an annual cargo volume less than 500 tons, "Y" is 1.2 tons/ m^2 for domestic cargo, and 0.5 tons/ m^2 for international and CIS cargo.

Table 4.4.11 Handling Cargo Volume per Unit Floor Area

Airport	Existing Floor Area (m^2)	Handling Cargo (ton)		Handling Cargo per Unit Area (ton/m^2)	
		1990	1995	1990	1995
Tashkent	4,300	23,151	7,235	5.4	1.7
Namangan		6,348	433		
Andizhan		1803	46		
Fergana		3,849	1,858		
Kokand	60	166	15	2.8	0.3
Samarkand	510	3,489	144	6.8	0.3
Termez		348	24		
Karshi		130	33		
Bukhara	250	976	112	3.9	0.4
Navoi		46	2		
Urgench	250	1,155	134	4.6	0.5
Nukus	550	1,133	33	2.1	0.1

(4) Car Park Area

Number of parking lots required and required area is determined in accordance with the following steps:

- Number of parking lots requirement
  = (peak-hour passengers) x (parking ratio)
  Parking ratio is assumed at 0.8 based on the JCAB regulations.
- Required car park area
  = (Number of parking lots requirement) x (35 m^2/car)

Table 4.4.12 Number of Existing Parking Lots per Passenger

Airport	Number of Parking Lots (Area : m²)	Peak-Hour Passengers	Number of Parking Lots per Passenger
Tashkent	NA		
Namangan	80 (1,000)	80	1.0
Andizhan	NA		
Fergana	NA		
Kokand	50 (521)	80	0.6
Samarkand	50	80	0.6
Termez	80 (1,200)	80	1.0
Karshi	NA		
Bukhara	50	80	0.6
Navoi	NA		
Urgench	80	80	1.0
Nukus	NA (2,000)		
Average			0.8

(5) Control Tower and Administration Building

Control tower and administration building will consist of tower, operation and equipment room for air traffic control services, and office space for air traffic control personnel and maintenance staff for ATC equipment.

In accordance with the JCAB regulations, floor area requirement is calculated as shown in **Table 4.4.13**. Timing for construction of control tower and administration building is planned at the same time as large replacement of air navigation facilities. When the new control tower and administration building are due to be constructed, the existing NAC administration building will be used as a supplementary administration building,

Table 4.4.13 Floor Area Requirements of Tower and Administration Building

Airport Category	Floor Area (m²)	Capacity of Staff (*)
I	5,700	1,600
II	2,800	1,200
III	1,400	800

(6) Power Supply Station Building

In accordance with the JCAB standards, floor area requirements for the power supply station building for airfield lighting, radio navigational facilities and telecommunication facilities are determined as shown in **Table 4.4.14**. Power supply stations for other buildings are to be prepared in the respective building.

Table 4.4.14 Requirement of Power Supply Station Building

Airport Category	Required Floor Area (m²)
I	248
II	92
III	25

(7) Rescue and Fire Fighting Station

In accordance with the ICAO regulations, the required area for rescue and fire fighting station is determined based on the airport category, type of aircraft,. as shown in **Table 4.4.15**.

Table 4.4.15 Required Area for Rescue and Fire Fighting Building

Airport Category	Maximum Aircraft	Required Area (m^2)
9	Large Aircraft	900
8	Large aircraft	900
	Other Aircraft	700
7	Large aircraft	800
	Other Aircraft	700
6	Large aircraft	600
	Other Aircraft	600
5	Large aircraft	600
	Other Aircraft	500
4	Scheduled Flight	400
	Non Scheduled Flight	320

(8) Aircraft Fuel Facilities

Storage capacity of aircraft fuel is estimated based on the number of weekly departures by type of aircraft, and fuel consumption using the following calculation steps:

- Required Storage Capacity
  = (Number of weekly departures) x (Fuel consumption by type of aircraft)
- Fuel Consumption by Type of Aircraft
  In accordance with the JCAB standards, fuel consumption by type of aircraft is estimated using the following formula:

  Large Jet $Y = 0.0130 X + 4.80$
  Medium Jet $Y = 0.0076 X + 3.20$
  Small Jet $Y = 0.0041 X + 0.75$
  Mini Plane $Y = 0.0010 X + 0.60$

  Where, Y : Fuel consumption per flight (Kiloliter)
  X : Haul distance (Km)

International Flight	In average 5,000 Km
CIS Flight	In average 3,000 Km
Domestic Flight	In average 450 Km

(9) Aircraft Maintenance Facilities

The existing area for maintenance facilities at Tashkent airport is 21,300 m^2 having 8 bays for aircraft maintenance as shown below:

- Avia Repair Plant No. 243 100 m x 45 m = 4,500 m^2
- Hanger 240 m x 70 m = 16,800 m^2
- Total 21,300 m^2
- Number of Bays 8 bays
- One Bay Area 2,660 m^2

Area requirements for aircraft maintenance is estimated based on the relationship between the number of current aircraft movements and the existing area. Current aircraft movements at Tashkent airport are about 35 thousand, and the required number of bays is 2.3 per 10 thousand landings and take-offs. Applying this rate to future aircraft movements, the area requirements for the maintenance area is as shown in **Table 4.4.16.**

Table 4.4.16 Maintenance Area Requirements

Year	Annual Aircraft Movement	Number of Bays	Area (m^2)
2000	27 thousands	7	21,300
2005	31 thousands	8	21,300
2010	35 thousands	8	21,300
2015	39 thousands	9	23,900
2020	44 thousands	11	29,300

(10) Utilities

Requirements for electric power supply, water supply and sewage treatment are estimated based on the unit demand as shown in **Table 4.4.17**.

Table 4.4.17 Requirements for Utilities

Utilities	Unit	Facilities	Unit Demand
Electricity	VA/m^2	Passenger Terminal Building	100
		Cargo Terminal Building	60
		Administration Building & Others	80
Water Supply /Sewage	$Ton/m^2/day$	Passenger Terminal Building	0.023
		Cargo Terminal Building	0.003
		Administration Building & Others	0.010
Solid Waste	$Kg/m^2/day$	Passenger Terminal Building	0.072
		Cargo Terminal Building	0.005
		Administration Building & Others	0.025

4.4.5 Planning Requirements of Air Navigation Facilities

The existing air navigation facilities at the local airports in Uzbekistan were installed mostly in the 1980s. In general, the life of air navigation facilities is 15 – 20 years. The majority of the existing air navigation facilities will become superannuated in the very near future, so that these facilities should be replaced by new ones, on a short-term development basis.

Furthermore, in the planning for long-term development of air transportation in Uzbekistan, the introduction of the Future Air Navigation System (FANS), which is proposed and developed by ICAO, should be taken into account.

The air navigation facility requirements are determined considering such factors as operational requirements, use by international/domestic general aviation aircraft; operation by wide-bodied aircraft, operations after dark; adversely affected by low ceiling and visibility, as well as ICAO standards and recommended practices.

Detailed requirements and planning criteria are shown in Chapter 4.6.

4.4.6 Summary of Facility Requirements

Summary of the facility requirements by airport and phase of development is given in **Tables 4.4.18, 4.4.19** and **4.4.20**.

Table 4.4.18 Summary of Facility Requirements (1)

Item			1 Tashkent						2 Namangan						3 Andizhan						4 Fergana					
			1995	2000	2005	2010	2015	2020	1995	2000	2005	2010	2015	2020	1995	2000	2005	2010	2015	2020	1995	2000	2005	2010	2015	2020
Demand	Annual Passenger ('000) one way	International	-	512	734	963	1,194	1,410	0	0	16	21	27	33	-	0	17	22	28	35	-	71	73	114	145	192
		CIS&Baltic	-	556	809	1,069	1,360	1,654	35.8	58	85	115	146	182	-	68	100	135	175	214	-	75	117	158	197	241
		Domestic	-	786	927	1,079	1,241	1,411	44.8	211	288	349	416	489	-	396	508	609	719	837	-	377	458	573	674	783
		Total	1,749	1,854	2,470	3,111	3,795	4,475	80.6	269	389	485	589	704	117.4	464	625	766	922	1,086	104.6	523	648	845	1,016	1,216
	Annual Cargo (ton)	International	-	15,285	20,771	27,670	32,294	37,210	-	769	1,189	1,633	2,093	2,569	-	-	528	726	930	1,142	-	3,260	4,512	6,666	8,543	12,039
		CIS&Baltic	-	4,908	7,830	10,953	14,310	17,807	-	367	587	825	1,078	1,341	-	729	1,166	1,637	2,145	2,675	-	1,161	1,880	2,640	3,441	4,299
		Domestic	-	904	1,753	2,668	3,642	4,669	-	243	544	863	1,221	1,617	-	455	961	1,506	2,111	2,771	-	434	867	1,417	1,979	2,590
		Total	14,470	21,097	30,354	41,291	50,246	59,686	866	1,379	2,320	3,321	4,392	5,530	92	1,184	2,655	3,869	5,186	6,588	3,715	4,855	7,259	10,723	13,966	18,928
	Annual Aircraft Movement ('000)	International Pax	-	3.4	4.9	6.4	7.8	9.5	-	-	0.1	0.1	0.2	0.2	-	-	0.1	0.1	0.2	0.2	-	0.5	0.5	0.7	0.9	1.3
		Medium-Jet	-	3.4	4.9	5.8	7.2	8.6	-	-	0.1	0.1	0.2	0.2	-	-	0.1	0.1	0.2	0.2	-	0.5	0.5	0.7	0.9	1.3
		Large-Jet	-	-	-	0.6	0.6	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CIS&Baltic Pax	-	5.3	7.3	9.2	11.0	13.4	-	0.5	0.7	1.0	1.4	1.6	-	0.6	0.8	1.3	1.6	2.0	-	0.7	1.2	1.6	1.8	2.2
		Mini-Plane	-	1.7	1.5	1.0	1.3	1.5	-	0.1	0.2	0.2	0.3	0.4	-	0.1	0.2	0.3	0.4	0.5	-	0.2	0.4	0.5	0.5	0.6
		Small-Jet	-	0.7	1.6	2.4	2.3	2.7	-	0.1	0.1	0.2	0.2	0.2	-	0.1	0.1	0.2	0.2	0.3	-	0.1	0.2	0.3	0.2	0.3
		Medium-Jet	-	2.9	4.3	5.0	6.7	8.2	-	0.3	0.4	0.6	0.8	0.9	-	0.4	0.5	0.7	0.9	1.1	-	0.4	0.5	0.7	1.0	1.3
		Large-Jet	-	-	-	0.7	0.8	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Domestic Pax	-	17.0	17.4	17.8	18.0	19.2	-	6.0	8.2	9.0	10.4	10.8	-	10.1	11.4	11.9	12.0	12.0	-	9.6	10.4	11.3	12.1	11.2
		Mini-Plane	-	11.1	9.1	5.9	6.6	7.6	-	6.0	8.2	7.5	8.8	6.9	-	8.4	8.4	6.5	4.2	2.8	-	8.0	7.5	6.1	4.9	2.5
		Small-Jet	-	5.8	7.6	11.0	7.8	6.3	-	-	-	1.5	1.6	4.0	-	1.7	3.0	5.4	7.1	7.7	-	1.6	2.9	5.2	6.5	7.3
		Medium-Jet	-	-	0.7	0.8	3.6	5.3	-	-	-	-	-	-	-	-	-	-	0.7	1.5	-	-	-	-	0.7	1.5
		Pax Total	-	25.7	29.5	33.4	36.8	42.1	-	6.5	9.1	10.1	12.0	12.6	-	10.7	12.4	13.2	13.7	14.2	-	10.8	12.1	13.6	14.8	14.7
		Cargo Freighter	-	0.9	1.2	1.6	1.9	2.3	-	0.05	0.07	0.10	0.13	0.17	-	0.02	0.07	0.09	0.12	0.15	-	0.22	0.34	0.49	0.64	0.88
		Total	34.8	26.6	30.7	35.0	38.7	44.4	2.6	6.6	9.1	10.2	12.1	12.8	3.2	10.7	12.4	13.3	13.9	14.3		11.0	12.4	14.1	15.4	15.6
	Peak Hour Aircraft Movement		-	13	15	16	18	20	-	5	6	6	8	8	-	7	8	8	8	9		8	8	9	9	9
	Plan Maximum Weight Aircrft	(Class)	IL86 Medium-Jet	IL86 Medium-Jet	IL86 Medium-Jet	B747-400 Large-Jet	B747-400 Large-Jet	B747-400 Large-Jet	IL76 Medium-Jet	IL76 Medium-Jet	IL76 Medium-Jet	IL76 Medium-Jet	IL76 Medium-Jet	IL76 Medium-Jet	TU154 Medium-Jet	TU154 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet	IL62 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet
		(Max.Weight)	215	215	215	395	395	395	190	190	190	190	190	190	100	100	160	160	160	160	170	160	160	160	160	160
	Peak Hour Passenger	Int'l	-	280	280	770	770	770	-		280	280	280	280	-		280	280	280	280	-	280	280	280	280	280
		CIS	-	420	420	770	1050	1050	-	280	280	280	280	280	-	280	280	280	280	280	-	280	280	280	280	280
		Domestic	-	350	630	700	700	700	-	140	140	210	280	280	-	280	280	280	560	560	-	280	280	280	560	560
Facility	Runway	length	4000	4000	4000 (New Tashkent 4300)	4400	4400	4400	3270	3270	3300 (New Runway)	3300	3300	3300	2900	2900 (Extension or new runway)	3000	3000	3000	3000	2860	3300 (New Runway)	3300	3300	3300	3300
		width	60	60	60	60	60	60	50	50	50	50	50	50	45	45	45	45	45	45	50	50	50	50	50	50
		Aircraft	IL86	IL86	IL86	B747-400	B747-400	B747-400	-	TU154	B767	B767	B767	B767	-	TU154	B767	B767	B767	B767	-	B767	B767	B767	B767	B767
	Runway Strip	length	4120	4120	4120	4520	4520	4520	3390	3390	3420	3420	3420	3420	3020	3020	3120	3120	3120	3120	2980	3420	3420	3420	3420	3420
		width	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
	Taxiway	System	Partial Parallel	Full Parallel	Full Parallel	Full Parallel (Extension)	Full Parallel	Full Parallel	partial Parallel	partial Parallel	partial Parallel	partial Parallel	Full Parallel	Full Parallel	Full Parallel	Full Parallel	Full Parallel	Full Parallel	Full Parallel	Full Parallel	Full Parallel	Full Parallel	Full Parallel	Full Parallel	Full Parallel	Full Parallel
		Max width	21-22.5	23	23	23	23	23	20	23	23	23	23	23	20-26	23	23	23	23	23	18-24	23	23	23	23	23
	Apron	Large-Jet	1	0	0	5	5	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Medium-Jet	35	10	14	12	17	20	5	2	3	3	3	3	2	2	3	3	4	4	6	3	3	3	4	4
		Small-Jet	26	4	4	7	5	4	2	0	0	1	1	1	3	1	1	2	2	2	3	1	1	2	2	2
		Mini-Plane	0	7	6	4	4	5	0	2	3	2	3	3	0	2	4	3	2	2	0	2	3	3	2	2
		Total	62	21	24	28	31	35	7	4	6	6	7	7	5	5	8	8	8	8	9	6	7	8	8	8
		Freighter	-	2	2	3	4	4	-			1	1	1	-				1	1	-	1	1	1	2	2
	Passenger Terminal Bldg. ('000sqrm)	Int'l	39.5	4.2	4.2	11.6	11.6	11.6	-	0.0	4.2	4.2	4.2	4.2	-	0.0	4.2	4.2	4.2	4.2	-	4.2	4.2	4.2	4.2	4.2
		CIS		6.3	6.3	11.6	15.8	15.8	-	4.2	4.2	4.2	4.2	4.2	-	4.2	4.2	4.2	4.2	4.2	-	4.2	4.2	4.2	4.2	4.2
		Domestic	2.9	4.2	7.6	8.4	8.4	8.4	-	1.7	1.7	2.5	3.4	3.4	-	3.4	3.4	3.4	6.7	6.7	-	3.4	3.4	3.4	6.7	6.7
		Total	42.4	14.7	18.1	31.6	35.8	35.8	4.2	5.9	10.1	10.9	11.8	11.8	-	7.6	11.8	11.8	15.1	15.1	-	11.8	11.8	11.8	15.1	15.1
	Cargo Terminal Bldg. ('000sqrm)	Int'l	-	3.1	4.0	5.0	5.8	6.4	-	1.3	1.3	1.4	1.5	1.6	-		1.1	1.2	1.2	1.3	-	1.6	1.8	2.0	2.1	2.5
		CIS	-	1.8	2.1	2.3	2.9	3.5	-	0.7	1.2	1.2	1.4	1.4	-	1.2	1.3	1.4	1.5	1.6	-	1.3	1.5	1.7	1.7	1.8
		Dom.	-	0.5	0.6	0.6	0.7	0.7	-	0.2	0.5	0.5	0.5	0.6	-	0.4	0.5	0.6	0.6	0.6	-	0.4	0.5	0.6	0.6	0.6
		Total	4.3	5.4	6.6	8.0	9.4	10.6	0.1	2.2	2.9	3.1	3.4	3.5	-	1.6	2.9	3.1	3.3	3.5	-	3.3	3.7	4.2	4.4	4.9
	Control Power/Operations(sqrm)		-	---	---	---	---	---	-	---	2800	2800	2800	2800	-	---	1400	1400	1400	1400	-	---	2800	2800	2800	2800
	Aircraft Fuel	Tank Capacity (kl)	-	2740	4050	5620	6820	8270	-	150	280	350	480	540	-	240	340	470	630	780	-	510	610	880	1140	1410
	Supply	Area ('000sqrm)	-	10.4	14.3	14.3	14.3	19.5	-	2.8	3.15	3.85	3.85	3.85	-	4	4	4	4.8	4.8	-	4	4.8	4.8	6	6
	Rescue and Fire Fighting	Category	-	8	8	8	8	8	-	6	6	6	6	6	-	6	6	6	6	6	-	6	6	6	6	6
		Facility (sqrm)	630	700	700	900	900	900	-	600	600	600	600	600	-	600	600	600	600	600	-	600	600	600	600	600
	Car parking	Lots	-	840	1060	1800	2020	2020	80	330	550	610	660	660	-	440	660	660	890	890	-	660	660	660	890	890
		Area('000sqrm)	-	29.4	37.1	63	70.7	70.7	1.1	11.6	19.3	21.4	23.1	23.1	-	15.4	23.1	23.1	31.2	31.2	-	23.1	23.1	23.1	31.2	31.2
	Utilities	Power (KVA)	-	4130	4550	5990	6700	7210	-	940	1410	1490	1600	1610	-	1080	1570	1590	1930	1940	-	1750	1770	1800	2140	2180
		Water (ton/day)	-	650	730	1040	1170	1230	-	180	270	290	310	310	-	210	310	310	390	390	-	330	330	330	410	410
		Sewage (ton/day)	-	650	730	1040	1170	1230	-	180	270	290	310	310	-	210	310	310	390	390	-	330	330	330	410	410
		Waste (ton/day)	-	1820	2060	3050	3420	3560	-	500	810	880	940	940	-	620	930	940	1180	1180	-	990	990	990	1230	1230
	Airfield Lighting		SALS,SFL,PAPI,RCLR WL,TWL,AFL	SALS,SFL,PAPI,RCLR WL,TWL,AFL	SALS,SFL,PAPI,RCLR WL,TWL,AFL	SALS,SFL,PAPI,RCLR WL,TWL,AFL	SALS,SFL,PAPI,RCLR WL,TWL,AFL	SALS,SFL,PAPI,RCLR WL,TWL,AFL	ALS,RWL,TWL,AFL	ALS,RWL,TWL	PALS, PAPI, SALS,RWL, TWL,AFL	PALS, PAPI, SALS,RWL, TWL,AFL	PALS, PAPI, SALS,RWL, TWL,AFL	PALS, PAPI, SALS,RWL, TWL,AFL	-	(ALS,RWL, TWL) AFL	SALS, PAPI, RWL,TWL, AFL	SALS,PAPI, RWL,TWL, AFL	SALS,PAPI, RWL,TWL, AFL	SALS,PAPI, RWL,TWL, AFL	-	(ALS,SALS, RWL,TWL) AFL	PALS,PAPI SALS,RWL TWL,AFL	PALS,PAPI SALS,RWL TWL,AFL	PALS,PAPI SALS,RWL TWL,AFL	PALS,PAPI, SALS,RWL, TWL,AFL
	Radio Navaids and Telecommunications		CAT II ILS,VOR,DME,PAR,6NDB	CAT II ILS,VOR,DME,PAR, NDB,ASDE	CAT II ILS,VOR,DME,PAR, NDB,ASDE	CAT II ILS,VOR,DME,PAR, NDB,ASDE	CAT II ILS,VOR,DME,PAR, NDB,ASDE	CAT II ILS,VOR,DME,NDB,ASDE,FANS	ILS,PAR,NDBx2	ILS,PAR, NDB	CAT I ILS,PAR, NDB, VOR,DME	CAT I ILS,PAR, NDB, VOR,DME	CAT I ILS,PAR, NDB, VOR,DME	CAT I ILS,PAR, NDB,VOR, DME,FANS	-	(ILS etc)	NDB, VOR,DME	NDB, VOR,DME	NDB, VOR,DME, FANS	-	(ILS etc)	CAT I ILS,NDB, VOR,DME	CAT I ILS,NDB, VOR,DME	CAT I ILS,NDB, VOR,DME	CAT I ILS,NDB, VOR,DME, FANS

Table 4.4.19 Summary of Facility Requirements (2)

Item			5 Kokand						6 Samarkand						7 Termez						8 Karshi					
			1995	2000	2005	2010	2015	2020	1995	2000	2005	2010	2015	2020	1995	2000	2005	2010	2015	2020	1995	2000	2005	2010	2015	2020
Demand	Annual Pssenger ('000) one way	International	-	0	0	0	0	0	-	77	102	139	191	233	-	0	0	15	18	22	-	0	14	19	24	30
		CIS&Baltic	-	0	0	0	0	0	-	84	119	168	214	258	-	33	55	71	94	115	-	56	81	109	139	174
		Domestic	-	14	17	19	47	54	-	199	267	318	373	460	-	217	268	351	418	491	-	123	179	217	259	304
		Total	47.4	14	17	19	47	54	91.2	360	488	625	778	951	171.8	252	323	440	530	628	67.4	179	274	345	422	508
	Annual Cargo (ton)	International	-	-	-	-	-	-	-	2,820	3,777	5,275	7,856	9,641	-	-	-	317	407	499	-	-	583	801	1,026	1,260
		CIS&Baltic	-	-	-	-	-	-	-	520	819	1,178	1,538	1,911	-	311	510	716	935	1,166	-	504	1,286	1,806	2,360	2,952
		Domestic	-	17	32	48	139	180	-	229	505	786	1,091	1,521	-	249	506	867	1,228	1,625	-	142	339	537	760	1,005
		Total	15	17	32	48	139	180	287	3,569	5,101	7,239	10,488	13,073	146	560	1,016	1,900	2,570	3,290	37.8	946	2,208	3,114	4,146	5,217
	Annual Aircraft Movement ('000)	International Pax	-	-	-	-	-	-	-	0.5	0.7	0.8	1.3	1.6	-	-	-	0.1	0.1	0.1	-	-	0.1	0.1	0.2	0.2
		Medium-Jet	-	-	-	-	-	-	-	0.5	0.7	0.8	1.3	1.6	-	-	-	0.1	0.1	0.1	-	-	0.1	0.1	0.2	0.2
		Large-Jet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CIS&Baltic Pax	-	-	-	-	-	-	-	0.8	1.0	1.7	2.1	2.4	-	0.2	0.5	0.6	0.8	1.0	-	0.5	0.7	0.9	1.3	1.6
		Mini-Plane	-	-	-	-	-	-	-	0.3	0.3	0.5	0.6	0.7	-	-	0.1	0.1	0.2	0.2	-	0.1	0.2	0.2	0.3	0.4
		Small-Jet	-	-	-	-	-	-	-	0.1	0.1	0.3	0.3	0.3	-	-	0.1	0.1	0.1	0.2	-	0.1	0.1	0.1	0.2	0.2
		Medium-Jet	-	-	-	-	-	-	-	0.4	0.6	0.8	1.1	1.4	-	0.2	0.3	0.4	0.5	0.6	-	0.3	0.4	0.6	0.7	0.9
		Large-Jet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Domestic Pax	-	0.4	0.5	0.5	1.4	1.6	-	5.7	6.6	6.9	7.6	8.6	-	5.5	5.8	6.8	7.7	7.2	-	3.5	5.2	5.7	5.5	6.2
		Mini-Plane	-	0.4	0.5	0.5	1.4	1.6	-	5.7	5.1	4.6	4.4	3.7	-	4.7	3.6	3.6	4.5	1.9	-	3.5	5.2	5.0	3.3	3.9
		Small-Jet	-	-	-	-	-	-	-	-	1.5	2.3	3.2	4.9	-	0.8	2.2	3.1	2.5	4.6	-	-	-	0.7	2.2	2.4
		Medium-Jet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	0.7	-	-	-	-	-	-
		Pax Total	-	0.4	0.5	0.5	1.4	1.6	-	7.1	8.3	9.4	10.9	12.6	-	5.7	6.3	7.5	8.6	8.3	-	4.1	6.0	6.8	7.0	8.0
		Cargo Freighter	-	-	-	-	-	-	-	0.15	0.21	0.31	0.45	0.55	-	0.01	0.01	0.03	0.04	0.06	-	0.03	0.08	0.12	0.16	0.20
		Total	-	0.4	0.5	0.5	1.4	1.6	2.4	7.2	8.5	9.7	11.4	13.1	2.5	5.7	6.3	7.5	8.7	8.4	2.5	4.1	6.1	6.9	7.1	8.2
Peak Hour Aircraft Movement			-	1	2	2	2	2	-	6	7	7	8	8	-	4	5	5	6	6	-	4	5	5	6	6
Plan Maximum Weight Aircrft		(Class)	AN24 Mini-Plane	AN24 Mini-Plane	AN24 Mini-Plane	IL114 Mini-Plane	IL114 Mini-Plane	IL114 Mini-Plane	TU154 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet	IL76 Medium-Jet	IL76 Medium-Jet	IL76 Medium-Jet	IL76 Medium-Jet	IL76 Medium-Jet	IL76 Medium-Jet	TU154 Medium-Jet	TU154 Medium-Jet	TU154 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet
		(Max.Weight)	25	25	25	25	25	25	100	160	160	160	160	160	190	190	190	190	190	190	100	100	100	160	160	160
Peak Hour Passenger		Int'l	-							280	280	280	280	280	-				280	280	-			280	280	280
		CIS	-						-	280	280	280	280	280	-	280	280	280	280	280	-	280	280	280	280	280
		Domestic	-	70	70	70	70	70	-	140	210	210	210	210	-	210	210	210	420	420	-	70	140	210	210	210
Facility	Runway	length	1600	1600	1600	2200 (Extension)	2200	2200	3100	3100	3100	3100	3100	3100	3000	3000	3000	3000	3000	3000	2900	2900	2900	3000	3000	3000
		width	40	40	40	40	40	40	49	49	49	49	49	49	42	45	45	45	45	45	42	45	45	45	45	45
		Aircraft	1720.0	AN24	AN24	IL114	IL114	IL114	TU154	B767	B767	B767	B767	B767		TU154	TU154	B767	B767	B767		TU154	TU154	B767	B767	B767
	Runway Strip	length	1720	1720	1720	2320	2320	2320	3220	3220	3220	3220	3220	3220	3120	3120	3120	3120	3120	3120	3020	3020	3020	3120	3120	3120
		width	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
	Taxiway	System	Full Parallel	Full Parallel	Full Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Full Parallel	Full Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel
		Max width	14-16	18	18	18	18	18	18-21	23	23	23	23	23	20	23	23	23	23	23	21-22	23	23	23	23	23
	Apron	Large-Jet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Medium-Jet	0	0	0	0	0	0	4	3	3	3	3	3	2	2	2	2	4	4	3	2	2	3	3	3
		Small-Jet	0	0	0	0	0	0	18	0	1	1	1	2	5	1	1	1	1	1	8	0	0	1	1	1
		Mini-Plane	3	2	2	2	2	2	0	2	3	3	3	2	0	1	1	2	2	2	0	2	2	2	2	3
		Total	3	2	2	2	2	2	22	5	7	7	7	7	7	4	4	5	7	7	11	4	4	6	6	7
		Freighter	-						-	1	1	1	1	1	-						-			1	1	1
	Passenger Terminal Bldg.	Int'l	-	0.0	0.0	0.0	0.0	0.0	-	4.2	4.2	4.2	4.2	4.2	-	0.0	0.0	0.0	4.2	4.2	-	0.0	0.0	4.2	4.2	4.2
		CIS	-	0.0	0.0	0.0	0.0	0.0	-	4.2	4.2	4.2	4.2	4.2	-	4.2	4.2	4.2	4.2	4.2	-	4.2	4.2	4.2	4.2	4.2
		Domestic	-	0.8	0.8	0.8	0.8	0.8	-	1.7	2.5	2.5	2.5	2.5	-	2.5	2.5	2.5	5.0	5.0	-	0.8	1.7	2.5	2.5	2.5
		Total	0.32	0.8	0.8	0.8	0.8	0.8	5.3	10.1	10.9	10.9	10.9	10.9	2.2	6.7	6.7	6.7	13.4	13.4	2.4	5	5.9	10.9	10.9	10.9
	Cargo Terminal Bldg. ('000sqrm)	Int'l	-						-	1.6	1.8	1.9	2.1	2.1	-				0.8	1.0	-			1.1	1.3	1.4
		CIS	-						-	1.0	1.2	1.3	1.4	1.5	-	0.6	1.0	1.2	1.2	1.3	-	1.2	1.3	1.5	1.6	1.6
		Dom.	-	0.01	0.03	0.04	0.12	0.2	-	0.2	0.4	0.5	0.5	0.6	-	0.2	0.4	0.5	0.5	0.6	-	0.1	0.3	0.5	0.5	0.5
		Total	0.06	0.01	0.03	0.04	0.12	0.2	0.5	2.8	3.4	3.7	4.0	4.2	-	0.8	1.4	1.7	2.5	2.9	-	1.3	1.6	3.1	3.3	3.5
Control Tower/Operations(sqrm)			941	---	1400	1400	1400	1400	1.6	---	---	---	---	---	-	---	2800	2800	2800	2800	-	---	1400	1400	1400	1400
Aircraft Fuel		Tank Capacity (kl)	-	4	5	5	12	14	-	420	660	840	1100	1340	-	130	200	260	370	450	-	130	210	310	420	520
Supply		Area('000srm)	0.24	1.4	1.4	1.4	1.4	1.4	-	4	4.8	4.8	6	6	1.5	2.8	3.15	3.15	3.85	3.85	-	2.8	3.15	3.15	3.85	3.85
Rescue and Fire Fighting	Category		-	5	5	5	5	5	-	6	6	6	6	6		6	6	6	6	6	-	6	6	6	6	6
	Facility (sqrm)		324	500	500	500	500	500	610	---	---	---	---	---	576	600	600	600	600	600	-	600	600	600	600	600
Car parking	Lots		50	60	60	60	60	60	50	550	610	610	610	610	80	390	390	390	780	780	-	280	330	610	610	610
	Area('000sqrm)		0.521	2.1	2.1	2.1	2.1	2.1	-	19.3	21.4	21.4	21.4	21.4	1.2	13.7	13.7	13.7	27.3	27.3	-	9.8	11.6	21.4	21.4	21.4
Utilities		Power (KVA)	400	400	310	310	310	310	610	1550	1660	1680	1700	1710	-	1090	1130	1140	1860	1880	-	800	900	1500	1510	1520
		Water (ton/day)	198	198	60	60	60	60	1600	290	310	310	310	310	29	210	210	210	370	370	-	160	180	290	290	290
		Sewage (ton/day)	-	-	60	60	60	60	-	290	310	310	310	310	-	210	210	210	370	370	-	160	180	290	290	290
		Waste (ton/day)	-	-	140	140	140	140	-	860	930	930	930	930	-	610	610	610	1100	1100	-	440	500	880	880	880
Airfield Lighting			None	None	None	SALS,PAPI, RWL,TWL, AFL	SALS,PAPI, RWL,TWL, AFL	SALS,PAPI, RWL,TWL, AFL	ALS,SALS, RWL,TWL, AFL	PALS, PAPI, SALS,RWL, TWL, AFL	PALS,PAPI, SALS,RWL, TWL, AFL	PALS,PAPI, SALS,RWL, TWL, AFL	PALS,PAPI, SALS,RWL, TWL, AFL	PALS,PAPI, SALS,RWL, TWL, AFL	ALS,RWL, TWL,AFL	ALS,RWL, TWL,AFL	PALS,PAPI, SALS,RWL, TWL, AFL	PALS,PAPI, SALS,RWL, TWL, AFL	PALS,PAPI, SALS,RWL, TWL, AFL	PALS,PAPI, SALS,RWL, TWL, AFL	ALS,RWL,T WL,AFL	ALS,RWL,T WL,AFL	ALS,RWL,T WL,AFL	SALS, PAPI,RWL, TWL,AFL	SALS, PAPI,RWL, TWL,AFL	SALS, PAPI,RWL, TWL,AFL
										CAT I	CAT I	CAT I	CAT I	CAT I		CAT I	CAT I	CAT I	CAT I	CAT I						
Radio Navaids and Telecommunications			NDB×2, (9dy)	NDB (9dy)	NDB (9dy)	NDB, VOR/DME	NDB, VOR/DME	NDB, VOR/DME, FANS	ILS,NDB×2	ILS,NDB	ILS,NDB	ILS,NDB	ILS,NDB	ILS,NDB, FANS	ILS,NDB×2, VOR/DME	ILS,NDB×2, VOR/DME	ILS,NDB×2, VOR/DME	ILS,NDB×2, VOR/DME	ILS,NDB×2, VOR/DME	ILS,NDB×2, VOR/DME, FANS	ILS,NDB×2	ILS,NDB	ILS,NDB	NDB VOR/DME	NDB, VOR/DME	NDB, VOR/DME, FANS

Table 4.4.20 Summary of Facility Requirements (3)

Item			9 Bukhara						10 Navoi						11 Urgench						12 Nukus					
			1995	2000	2005	2010	2015	2020	1996	2000	2005	2010	2015	2020	1995	2000	2005	2010	2015	2020	1995	2000	2005	2010	2015	2020
Demand	Annual Pssenger ('000) one way	International	-	25	69	93	102	140	-	0	0	0	15	19	-	14	21	13	32	56	-	0	0	15	20	24
		CIS&Baltic	-	65	91	126	161	205	-	45	72	96	122	149	-	34	50	71	90	107	-	57	83	112	142	178
		Domestic	-	197	238	282	331	383	-	25	55	90	105	121	-	296	387	489	603	703	-	176	212	252	296	370
		Total	88.2	287	398	501	594	728	22.2	70	127	186	242	289	137.0	344	458	573	725	866	100.0	233	295	379	458	572
	Annual Cargo (ton)	International	-	688	3,925	5,393	5,792	7,678	-	-	-	-	1,120	1,374	-	315	488	380	2,555	3,430	-	-	-	291	372	457
		CIS&Baltic	-	613	945	1,335	1,744	2,216	-	855	1,404	1,971	2,575	3,212	-	381	609	860	1,124	1,398	-	292	467	655	856	1,071
		Domestic	-	227	450	698	971	1,266	-	29	103	223	308	399	-	340	731	1,210	1,771	2,326	-	202	401	624	867	1,224
		Total	224	1,528	5,320	7,426	8,507	11,160	-	884	1,507	2,194	4,003	4,985	133.6*2	1,036	1,828	2,450	5,450	7,154	70	494	868	1,570	2,095	2,752
	Annual Aircraft Movement ('000)	International Pax	-	0.2	0.4	0.5	0.7	0.9	-	-	-	-	0.1	0.1	-	0.1	0.1	0.1	0.2	0.3	-	-	-	0.1	0.1	0.2
		Medium-Jet	-	0.2	0.4	0.5	0.7	0.9	-	-	-	-	0.1	0.1	-	0.1	0.1	0.1	0.2	0.3	-	-	-	0.1	0.1	0.2
		Large-Jet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CIS&Baltic Pax	-	0.6	0.8	1.1	1.6	2.0	-	0.4	0.6	0.8	1.0	1.4	-	0.3	0.5	0.7	0.8	0.9	-	0.5	0.7	0.9	1.3	1.6
		Mini-Plane	-	0.2	0.2	0.3	0.5	0.6	-	-	0.1	0.2	0.2	0.3	-	0.1	0.1	0.2	0.3	0.3	-	0.1	0.2	0.2	0.3	0.4
		Small-Jet	-	0.1	0.1	0.2	0.2	0.3	-	0.1	0.1	0.1	0.2	0.2	-	-	0.1	0.1	0.1	0.1	-	0.1	0.1	0.1	0.2	0.2
		Medium-Jet	-	0.3	0.5	0.6	0.8	1.0	-	0.3	0.4	0.5	0.6	0.8	-	0.2	0.3	0.4	0.4	0.5	-	0.3	0.4	0.6	0.7	0.9
		Large-Jet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Domestic Pax	-	5.0	6.0	5.6	6.4	5.6	-	0.7	1.6	2.5	2.9	3.5	-	5.8	6.6	7.5	9.1	9.5	-	4.4	5.2	5.7	5.8	6.7
		Mini-Plane	-	4.3	5.2	2.7	3.2	0.7	-	0.7	1.6	2.5	2.9	3.5	-	2.6	3.6	2.4	3.5	4.1	-	3.6	4.4	4.3	2.7	3.7
		Small-Jet	-	0.7	0.8	2.9	3.2	4.2	-	-	-	-	-	-	-	3.2	2.2	4.3	4.1	2.3	-	0.7	0.8	1.5	3.1	2.2
		Medium-Jet	-	-	-	-	-	0.7	-	-	-	-	-	-	-	-	0.7	0.8	1.5	3.1	-	-	-	-	-	0.7
		Pax Total	0.7	5.8	7.3	7.3	8.7	8.5	-	1.1	2.2	3.3	4.1	5.0	-	6.2	7.2	8.3	10.1	10.7	-	4.9	5.9	6.8	7.2	8.4
		Cargo Freighter	-	0.05	0.25	0.35	0.42	0.53	-	0.03	0.07	0.10	0.19	0.24	-	0.02	0.04	0.05	0.19	0.25	-	0.00	0.00	0.01	0.02	0.02
		Total	1.4	5.9	7.5	7.6	9.2	9.1	-	1.2	2.3	3.4	4.2	5.2	4.0	6.3	7.2	8.4	10.3	11.0	5.4	4.9	5.9	6.8	7.2	8.5
	Peak Hour Aircraft Movement		-	5	7	6	7	7	-	3	3	4	4	5	-	5	5	6	7	8	-	4	5	5	6	6
	Plan Maximum Weight Aircrft	(Class)	TU154 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet	AN24 Mini-Plane	TU154 Medium-Jet	TU154 Medium-Jet	TU154 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet	IL76 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet	B767 Medium-Jet	IL62 Medium-Jet	IL62 Medium-Jet	IL62 Medium-Jet	IL62 Medium-Jet	IL62 Medium-Jet	IL62 Medium-Jet
		(Max.Weight)	100	160	160	160	160	160	25	100	100	100	160	160	191	160	160	160	160	160	165	165	165	165	165	165
	Peak Hour Passenger	Int'l	-	280	280	280	280	280	-				280	280	-	280	280	280	280	280	-			280	280	280
		CIS	-	280	280	280	280	280	-	280	280	280	280	280	-	280	280	280	280	280	-	280	280	280	280	280
		Domestic	-	210	210	210	210	420	-	70	70	70	70	70	-	210	420	420	420	490	-	210	210	210	210	420
Facility	Runway	length	3000	3100 (Extension)	3100	3100	3100	3100	1410	2600	2600	2600	3100	3100	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
		width	45	45	45	45	45	45	45	45	45	45	45	45	44	45	45	45	45	45	48	48	48	48	48	48
		Aircraft		B767	B767	B767	B767	B767		A310	A310	A310	B767	B767		B767	B767	B767	B767	B767		B767	B767	B767	B767	B767
	Runway Strip	length	3120	3220	3220	3220	3220	3220	1530	2720	2720	2720	3220	3220	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
		width	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
	Taxiway	System	None	Partial Parallel (Extension)	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	None	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Full Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel	Partial Parallel
		Max width	18-30	23	23	23	23	23	14	23	23	23	23	23	21	23	23	23	23	23	22-36	23	23	23	23	23
	Apron	Large-Jet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Medium-Jet	4	3	3	3	3	4	0	2	2	2	3	3	3	3	4	4	4	5	3	2	2	3	3	4
		Small-Jet	5	1	1	1	2	1	4	0	0	0	0	0	2	2	1	1	1	1	5	1	1	1	2	1
		Mini-Plane	0	1	2	2	2	2	0	1	1	3	3	3	0	1	1	1	1	2	0	1	1	2	2	2
		Total	9	5	6	6	7	7	4	3	3	5	6	6	5	6	6	6	6	8	8	4	4	6	7	7
		Freighter	-				1	1	-				1	1	-				1	1	-					
	Passenger Terminal Bldg.	Int'l	-	4.2	4.2	4.2	4.2	4.2	-	0.0	0.0	0.0	4.2	4.2	-	4.2	4.2	4.2	4.2	4.2	-	0.0	0.0	4.2	4.2	4.2
		CIS	-	4.2	4.2	4.2	4.2	4.2	-	4.2	4.2	4.2	4.2	4.2	-	4.2	4.2	4.2	4.2	4.2	-	4.2	4.2	4.2	4.2	4.2
		Domestic	-	2.5	2.5	2.5	2.5	5.0	-	0.8	0.8	0.8	0.8	0.8	-	2.5	5.0	5.0	5.0	5.9	-	2.5	2.5	2.5	2.5	5.0
		Total	1.1	10.9	10.9	10.9	10.9	13.4	-	5	5	5	9.2	9.2	3.4	10.9	13.4	13.4	13.4	14.3	2.2	6.7	6.7	10.9	10.9	13.4
	Cargo Terminal Bldg. ('000sqrm)	Int'l	-	1.2	1.8	1.9	1.9	2.0	-				1.4	1.4	-	0.6	1.0	1.0	1.6	1.7	-			0.6	0.7	0.9
		CIS	-	1.2	1.2	1.3	1.5	1.6	-	1.2	1.4	1.5	1.6	1.7	-	0.8	1.2	1.2	1.4	1.4	-	0.6	0.9	1.1	1.2	1.3
		Dom.	-	0.2	0.4	0.5	0.5	0.5	-	0.0	0.1	0.2	0.3	0.3	-	0.3	0.5	0.5	0.6	0.6	-	0.2	0.3	0.5	0.5	0.5
		Total	0.25	2.6	3.3	3.7	3.9	4.1	-	1.2	1.5	1.7	3.3	3.4	0.3	1.7	2.7	2.7	3.6	3.7	0.6	0.8	1.3	2.1	2.4	2.8
	Control Tower/Operations(sqrm)		-	---	---	---	---	---	-	---	1400	1400	1400	1400	570	---	---	---	---	---		---	2800	2800	2800	2800
	Aircraft Fuel	Tank Capacity(kl)	-	240	470	620	800	1040	-	100	160	200	330	410	-	240	320	420	560	780	-	170	220	330	420	520
	Supply	Area('000srm)	-	4	4	4.8	4.8	4.8	-	2.8	2.8	3.15	3.15	3.85	-	4	4	4	4.8	4.8	-	2.8	3.15	3.15	3.85	3.85
	Rescue and Fire Fighting	Category	-	6	6	6	6	6	-	6	6	6	6	6	-	6	6	6	6	6	-	6	6	6	6	6
		Facility (sqrm)	1070	600	600	600	600	600	-	600	600	600	600	600	410	---	---	---	---	---	445	---	---	---	---	---
	Car parking	Lots	20	610	610	610	610	780	-	280	280	280	500	500	80	610	780	780	780	830	-	390	390	610	610	780
		Area('000sqrm)	-	21.4	21.4	21.4	21.4	27.3	-	9.8	9.8	9.8	17.5	17.5	-	21.4	27.3	27.3	27.3	29.1	2	13.7	13.7	21.4	21.4	27.3
	Utilities	Power (KVA)	1260	1610	1660	1680	1690	1960	-	790	810	820	1340	1340	800	1560	1870	1880	1930	2020	-	940	970	1440	1460	1730
		Water (ton/day)	-	310	310	310	310	370	-	160	160	160	250	250	-	310	370	370	370	390	-	190	190	290	290	350
		Sewage (ton/day)	-	310	310	310	310	370	-	160	160	160	250	250	-	310	370	370	370	390	-	190	190	290	290	350
		Waste (ton/day)	-	920	930	930	930	1110	-	440	440	440	760	760	-	920	1100	1100	1100	1170	-	560	560	870	870	1050
	Airfield Lighting		ALS,SALS, RWL,TWL, AFL	PALS, PAPI, SALS,RWL, TWL, AFL	PALS, PAPI SALS,RWL, TWL, AFL	PALS, PAPI SALS,RWL, TWL, AFL	PALS, PAPI SALS,RWL, TWL, AFL	PALS, PAPI SALS,RWL, TWL, AFL	None	SALS, PAPI,RWL, TWL,AFL	SALS, PAPI,RWL, TWL,AFL	SALS, PAPI,RWL, TWL,AFL	SALS, PAPI,RWL, TWL,AFL	SALS, PAPI,RWL, TWL,AFL	ALS,SALS, RWL,TWL, APL	PALS, PAPI, SALS,RWL, TWL, AFL	PALS, PAPI SALS,RWL, TWL, AFL	PALS, PAPI SALS,RWL, TWL, AFL	PALS, PAPI SALS,RWL, TWL, AFL	PALS, PAPI SALS,RWL, TWL, AFL	ALS,SALS, RWL,TWL	ALS,SALS, RWL,TWL	PALS, PAPI, SALS,RWL, TWL, AFL	PALS, PAPI SALS,RWL, TWL, AFL	PALS, PAPI SALS,RWL, TWL, AFL	PALS, PAPI SALS,RWL, TWL, AFL
				CAT I	CAT I	CAT I	CAT I	CAT I								CAT I	CAT I	CAT I	CAT I	CAT I			CAT I	CAT I	CAT I	CAT I
	Radio Navaids and Telecommunications		ILS,NDBx3	ILS,NDB	ILS,NDB, VOR,DME	ILS,NDB, VOR,DME	ILS,NDB, VOR,DME	ILS,NDB, VOR,DME, FANS	NDBx3	NDB, VOR,DME	NDB, VOR,DME	NDB, VOR,DME	NDB, VOR,DME	NDB, VOR,DME, FANS	ILS,VOR,DME,NDBx3	ILS,NDB, VOR,DME	ILS,NDB, VOR,DME	ILS,NDB, VOR,DME	ILS,NDB, VOR,DME	ILS,NDB, VOR,DME, FANS	ILS,NDBx3	ILS,NDB	ILS,NDB, VOR,DME	ILS,NDB, VOR,DME	ILS,NDB, VOR,DME	ILS,NDB, VOR,DME, FANS

4.5 Master Plan for Long-Term Development of Priority Airports

4.5.1 General

Based on the basic development strategy described in the previous section, Master planning of the priority airports will be made in the following sequence:

(1) Phasing of Development Plan

As stated in Chapter 4.4.3, the target year of the master plan for each airport is 2020, and its development is planned to be implemented by the following 4 stages:

- **First Stage** **Present - 2005**
- **Second Stage** **2006 - 2010**
- **Third Stage** **2011 - 2015**
- **Fourth Stage** **2016 - 2020**

(2) Priority Airports

The purpose of the Study is to prepare master plans of Class I and II airports for long-term development, and to select high priority projects for the subsequent Pre-Feasibility Study for short-term development.

Furthermore, recommendations on the modernization plan for long-term development of air transport system in Uzbekistan is another object of the Study. This is why master plan for Class III airports is also prepared in the Study.

(3) Coordination with Suspended Projects

As shown in **Table 4.5.1**, there are several projects that were planned before and after the independence of Uzbekistan, and suspended thereafter.

These previous projects shall be incorporated into the master plan taking into account the facility requirements of the respective airports.

As to the modernization project for the three local airports, namely, Samarkand, Bukhara and Urgench, now progressing up to the development target year of 2005, the plans for these airports are to be included in the master plans, but their costs shall not be included in the cost estimate.

Table 4.5.1 Suspended Projects

Airport	Suspended Projects
Tashkent	• Construction of international departure lounge
Andizhan	• Plan for construction of a new 3,500 m-long runway.
Karshi	• Overlay work for half of the runway pavement.
Kokand	• Extension of the existing runway ((1,600 m) to 3,000 m.
Namangan	• Overlay work of runway, taxiway and apron pavements. • Construction of new cargo terminal building
Navoi	• Extension of the existing runway (1,410 m) to 2,800 m.
Nukus	• Construction of new passenger terminal building

(4) Considerations on Facility Planning

a) Extension of Existing Runways

When extension of the existing runway may be required due to the introduction of medium or large jets, its extension direction shall be evaluated and determined from the following viewpoints:

- Availability of extension area;
- Previous runway extension plan;
- Land use condition under the approach course to the runway.

b) Pavement

The pavement requirements were determined based on the forecast aircraft movements and the collected data of the existing pavement, such as pavement classification number (PCN), actual thickness of each layer and its condition.

The required thickness of new pavement and overlay pavement are calculated in accordance with the Advisory Circular of FAA, AC150/5320-6c, Airport Pavement Design Evaluation.

- Design Aircraft for Pavement Thickness

Class I Airport B-747

Class II Airport B-767-300

Class III Airport B-767-300, and IL-114 for Kokand airport only.

- Equivalent Annual Departures

Equivalent annual departures are the number of departures of the design aircraft converted from departure movements of various types of aircraft operating at the airport, and is calculated based on the air traffic demand forecast.

Table 4.5.2 presents equivalent annual departures up to the year 2020 at each airport.

Table 4.5.2 Equivalent Annual Departures

Airport	Design Aircraft	Equivalent Annual Departures
Tashkent	B-747-400	8,866
New Tashkent	B-747-400	13,936
Namangan	B-767-300	429
Andizhan	B-767-300	833
Fergana	B-767-300	1,328
Kokand	IL-114	425
Samarkand	B-767-300	1,523
Termez	B-767-300	467
Karshi	B-767-300	522
Bukhara	B-767-300	930
Navoi	B-767-300	384
Urgench	B-767-300	603
Nukus	B-767-300	521

- Strength of Subgrade

Strength of subgrade is estimated as shown in **Table 4.5.3** from the Pavement

Classification Number (PCN) of the existing pavements of each airport.

Table 4.5.3 Assumed Strength of Subgrade

Airport	PCN of the Existing Runway	Rigid Pavement K Value (MN/m³)	Flexible Pavement CBR (%)
Tashkent	60/R/B/W/T, 50/F/C/Y/T	80	6
New Tashkent	-	80	6
Namangan	33/F/C/X/T	-	6
Andizhan	14/R/A/W/T	150	6
Fergana	50/F/B/W/T	-	10
Kokand	12/F/A/X/T	-	15
Samarkand	29/R/C/X/T	40 – 80	6-10
Termez	19/R/A/X/U	150	6
Karshi	17/F/B/X/T	-	10
Bukhara	17/R/A/X/T	150	6-15
Navoi	7/F/B/Y/T	150	10
Urgench	38/F/B/W/T	-	6 – 10
Nukus	20/R/A/X/T	150	10

- Required Thickness

Based on the above design conditions, the required thickness of new pavement and overlay was calculated as shown in **Table 4.5.4**. Minimum overlay thickness for strengthening existing pavement with asphalt concrete is 20 cm for rigid pavement, 8 cm for flexible pavement, based on ICAO recommendations. An overlay with asphalt concrete is planned to be carried out every 10 years as regular maintenance work of the pavement at each airport.

(5) Aircraft Stands Layout

Configuration of aircraft stands is usually determined by taking into consideration the terminal building concept, type of parking style (Nose-in parking or angled parking), size of aircraft.

The terminal building concept at local airports in Uzbekistan is mostly of the "linear type", and the parking style of aircraft is "angled nose-in/out by own power" or "parallel in/out by own power" due to the lack of pushing equipment.

In general, "nose-in by own power/out by pusher" parking requires less area space than "angled nose-in/out by own power" or "parallel in/out by own power" style. From the viewpoint of apron space requirements, "nose-in by own power/out by pusher" is recommendable. However, as "angled nose-in/out by own power" is commonly used at local airports in Uzbekistan, the parking style of aircraft at the existing Tashkent and local airports is planned to be as "angled nose-in/out by own power". Parking style at new Tashkent airport is of "Nose-in". Required dimensions are shown in **Table 4.5.5**.

Table 4.5.5 Dimension of Aircraft Parking Stands

Aircraft Type	Parking Style	Width (m)	Depth (m) (*)
Large Jet	Nose-in	75	130
Medium Jet	Nose-in	60	variable
	Angled nose-in/out by own power	B-767 80 A-310 70	102
Small Jet	Angled Nose-in/out by own power	40	variable
Mini Plane		60	67.5

Note : (*) : Depth includes space for apron edge taxiway.

Table 4.5.4 Pavement Thickness (1) - Runway

Airport Runway	Tashkent (08L/26R)	Tashkent (08R/26L)	New Tashkent	Namangan (New)	Andizhan	Fergana (New)	Kokand	Samarkand
Design Aircraft	B 747	B 747	B 747	B 767	B 767	B 767	IL-114	B 767
Equivalent Annual Departure	8,866	8,866	13,936	429	833	1,328	425	1,523
Flexible/Rigid	Rigid	Flexible	Flexible	Flexible	Rigid	Flexible	Flexible	Rigid
PCN	60/R/B/W/T	50/F/C/Y/T			14/R/A/W/T		12/F/A/X/T	29/R/C/X/T
Design CBR (%)		6	6	6		10	15	
Design K Value (MN/m3)	80				150			40
Existing Thickness (cm)	AC 12 CC 21 CC 20 CC 20 SB 15 total 88	AC 14 AC 20 BC 20 SB 40 total 94					AC 10 BC 25 total 35	AC 22 CC 22 SB 18 total 62
Required Thickness (cm)	CC 38	AC 127	AC 127	AC 99	CC 29	AC 69	AC 20	CC 39
Overlay Thickness for Strengthening (cm)					AC 20 (minimum)		no need	no need
Overlay Thickness for Superannuating (cm)	AC 8	AC 8					AC 5	AC 5
				PCN (Existing R/W): 33/F/C/X/T	Military Operation	PCN (Existing R/W): 50/F/B/W/T		Under reparing

Airport	Termez	Karshi	Bukhara	Navoi	Urgench	Nukus	Audizhan (New)
Design Aircraft	B 767	B 767	B 767	B 767	B 767	B 767	B 767
Equivalent Annual Departure	467	522	930	384	603	521	833
Flexible/Rigid	Rigid	Flexible	Rigid	Flexible	Flexible	Rigid	Flexible
PCN	19/R/A/X/U	17/F/B/X/T	17/R/A/X/T	7/F/B/Y/T	38/F/B/W/T	20/R/A/X/T	
Design CBR (%)		10		10	10		15
Design K Value (MN/m3)	150		150			150	
Existing Thickness (cm)	RC 14 BC 25 SB 50 total 89	AC 40 BC 40 total 80	AC 13 CC 29 SB 60 total 102	AC 8 BC 14 total 22	AC 37 BC 30 total 67	RC 18 SB 65 total 83	
Required Thickness (cm)	CC 29	AC 69	CC 29	AC 69	AC 69	CC 29	AC 51
Overlay Thickness for Strengthening (cm)	AC 20 (minimum)	no need	no need	AC 25	no need	AC 20 (minimum)	
Overlay Thickness for Superannuating (cm)		AC 5	AC 5		AC 5		
			Under reparing		Under Repaving		PCN (Existing R/W): 14/R/A/W/T

Table 4.5.4 Pavement Thickness (2) - Taxiway

Airport	Tashkent	Tashkent	New Tashkent	Namangan	Namangan	Namangan	Andizhan	Andizhan	Andizhan	Fergana	Fergana	Fergana	Kokand
	No.1~No.6	N.11~No.15		(Existing R/W)	(Existing T/W)	(New)	No.1	(Military)	No.8	(New)	(Military)	(NAC)	
Design Aircraft	B 747	B 747	B 747	B 767	B 767	B 767	B 767	B 767	B 767	B 767	B 767	B 767	IL-114
Equivalent Annual Departure	8,866	8,866	13,936	429	429	429	833	833	833	1,328	1,328	1,328	425
Flexible/Rigid	Rigid	Flexible	Flexible	Flexible	Flexible	Flexible	Rigid	Flexible	Flexible	Flexible	Flexible	Flexible	Flexible
PCN	61/R/B/W/T	50/F/C/Y/T		33/F/C/X/T	34/F/C/X/T		14/R/A/W/T	20/F/C/X/T	38/F/C/X/T		22/F/B/X/T	28/F/B/W/T	11/F/A/X/T
Design CBR (%)		6	6	6	6	6		6	6	10	10		15
Design K Value (MN/m3)	80						150						
Existing Thickness (cm)	CC 24	AC 10		AC 16	AC 24				AC 25			AC 26	AC 9
	CC 22	AC 20		BC 15	BC 15				BC 24			SB 24	BC 25
	SB 15	BC 20		SB 25	SB 40				SB 55				
		SB 40											
	total 61	total 90		total 56	total 79				total 104			total 50	total 34
Required Thickness (cm)	CC 38	AC 127	AC 127	AC 99	AC 99	AC 99	CC 29	AC 99	AC 99	AC 69	AC 69	AC 69	AC 29
Overlay Thickness for Strengthening (cm)	AC 20 (Minimum)	AC 10		AC 19	AC 8		AC 20 (minumum)	AC 20	no need		AC 20	AC 5	AC 5
Overlay Thickness for Superannuating (cm)									AC 5				
							Military Operation		NAC Operation				

Airport	Samarkand	Samarkand	Samarkand	Termez	Karshi	Bukhara	Navoi	Urgench	Urgench	Urgench	Nukus	Nukus	Andizhan
	T/W No.1, No.2	(Other Existing)	(New)					T/W No.1	(Other Existing)	(New)	T/W No.1~No.3	T/W No.4, No.5	(New)
Design Aircraft	B 767	B 767	B 767	B 767	B 767	B 767	B 767	B 767	B 767	B 767	B 767	B 767	B 767
Equivalent Annual Departure	1,523	1,523	1,523	467	522	930	384	603	603	603	521	521	833
Flexible/Rigid	Rigid	Rigid	Flexible	Flexible	Flexible	Flexible	Flexible	Flexible	Flexible	Flexible	Flexible	Flexible	Flexible
PCN	23/R/B/X/T	18/R/B/X/T		30/F/C/Y/T	12/F/B/X/T	31/F/C/Y/T	8/F/B/Y/T	38/F/B/X/T	16/F/B/X/T		42/F/B/X/T	26/F/B/X/T	
Design CBR (%)			10	6	10	6	10	10	10	10	10	10	15
Design K Value (MN/m3)	80	80											
Existing Thickness (cm)	AC 5	AC 10		AC 9	AC 24	AC 10	AC 8	AC 9	AC 27		AC 18	AC 31	
	AC 10	CC 27		AC 22	SB 20	AC 12	BC 14	AC 27	SB 40		BC 10	SB 22	
	CC 27	SB 18		SB 55		BC 20		SB 40			SB 50		
	BC 18					SB 50							
	total 60	total 55		total 86	total 44	total 92		total 76	total 67		total 78	total 53	
Required Thickness (cm)	CC 33	CC 33	AC 69	AC 99	AC 69	AC 99	AC 69	AC 69	AC 69	AC 69	AC 69	AC 69	AC 51
Overlay Thickness for Strengthening (cm)	no need	AC 10		AC 9	AC 8	no need	AC 25	no need	AC 15		AC 8	no need	
Overlay Thickness for Superannuating (cm)	AC 5					AC 5		AC 5				AC 5	
													PCN (Existing R/W) 14/R/A/W/T

Table 4.5.4 Pavement Thickness (3) - Apron

Airport	Tashkent No.1	Tashkent No.2	Tashkent No.3	New Tashkent	Namangan	Andizhan	Fergana	Kokand
Design Aircraft	B 747	B 747	B 747	B 747	B 767	B 767	B 767	IL-114
Equivalent Annual Departure	795	8,866	8,866	13,936	429	833	1,528	425
Flexible/Rigid	Rigid	Rigid	Rigid	Rigid	Flexible	Flexible	Flexible	Flexible
PCN	28/R/B/X/T	42/R/B/X/T	70/R/B/X/T		34/F/C/X/T	24/F/C/Y/T	24//F/B/X/T	7/F/A/X/T
Design CBR (%)					6	6	10	15
Design K Value (MN/m3)	80	80	80	80				
Existing Thickness (cm)	AC 10 CC 20 SB 15 total 45	CC 36 SB 40 total 76	CC 22 CC 20 SB 15 total 57		AC 15 BC 15 SB 40 total 70	AC 25 BC 24 SB 55 total 104	AC 19 SB 20 total 39	AC 9 BC 25 total 34
Required Thickness (cm)	CC 33	CC 38	CC 38	CC 38	AC 99	AC 99	AC 69	AC 20
Overlay Thickness for Strengthening (cm)	AC 20	AC 23	AC 25		AC 14	no need	AC 11	AC 5
Overlay Thickness for Superannuating (cm)						AC 5		
	Domestic	VIP	International			NAC Operation	NAC Operation	

Airport	Samarkand	Termez	Karshi	Bukhara	Navoi	Urgench	Nukus	
Design Aircraft	B 767	B 767	B 767	B 767	B 767	B 767	B 767	
Equivalent Annual Departure	1,523	467	522	930	384	603	521	
Flexible/Rigid	Rigid	Flexible	Flexible	Rigid	Flexible	Flexible	Flexible	
PCN	29/R/B/X/T	62/F/C/Y/T	16/F/B/X/T	25/R/A/X/T	11/F/B/Y/T	38/F/B/X/T	35/F/B/X/T	
Design CBR (%)		6	10		10	10	10	
Design K Value (MN/m3)	80			150				
Existing Thickness (cm)	AC 16 CC 27 SB 18 total 61	AC 20 BC 20 SB 50 total 90	AC 20 SB 30 total 50	AC 9 CC 33 SB 60 total 102	AC 8 BC 14 total 22	AC 9 AC 27 SB 40 total 76	AC 30 BC 10 SB 40 total 80	
Required Thickness (cm)	CC 33	AC 99	AC 69	CC 29	AC 69	AC 69	AC 69	
Overlay Thickness for Strengthening (cm)	no need	AC 8	AC 8	no need	AC 25	no need	no need	
Overlay Thickness for Superannuating (cm)	AC 5			AC 20		AC 5	AC 5	
	Under Repaving			Under Repaving		Under Repaving		

4.5.2 Development of Metropolitan Airport

(1) Facility Requirements of Metropolitan Airport

Summary of facility requirements for the long-term development of an airport in the Metropolitan area is shown in **Table 4.5.6**. Runway extensions and domestic passenger terminal building will be required, in order to serve the large western-made aircraft such as the B-747, and to meet the air traffic demand of 2010, providing that the existing Tashkent airport will continue to operate after 2010.

Table 4.5.6 Facility Requirement for Metropolitan Airport

Item			Existing (Tashkent)	1st stage (-2005)	2nd stage (2006-2010)	3rd stage (2011-2015)	4th stage (2016-2020)
Demand	Passenger ('000)		1,750	2,500	3,100	3,800	4,700
	Max. Aircraft		IL86 (Med Jet)	●B747(Large-Jet)			
Develop-ment	Airfield	Runway Taxiway	4,000m Partial	● Full Parallel		● 4,400m(Extension) ● Full Parallel (Extension)	
	Terminal	Pax. Bldg.		● Rehabilitation (International) ● Expansion (Domestic)			
	Air-Nav.			● VOR/DME, ASDE		● Renewal	
Remark							

However, continuous operation up to the year 2020 of the existing airport is expected to lead the following problems:

a) Impact of Aircraft Noise

Tashkent airport is located to the north of Tashkent city. There is a high density residential area expanding under the approach and departure course from/to the airport. As described in Chapter 5, the results of measurements of aircraft noise level conducted in May 1997, show that the noise level caused by aircraft operations was higher than the aircraft noise standards in Uzbekistan.

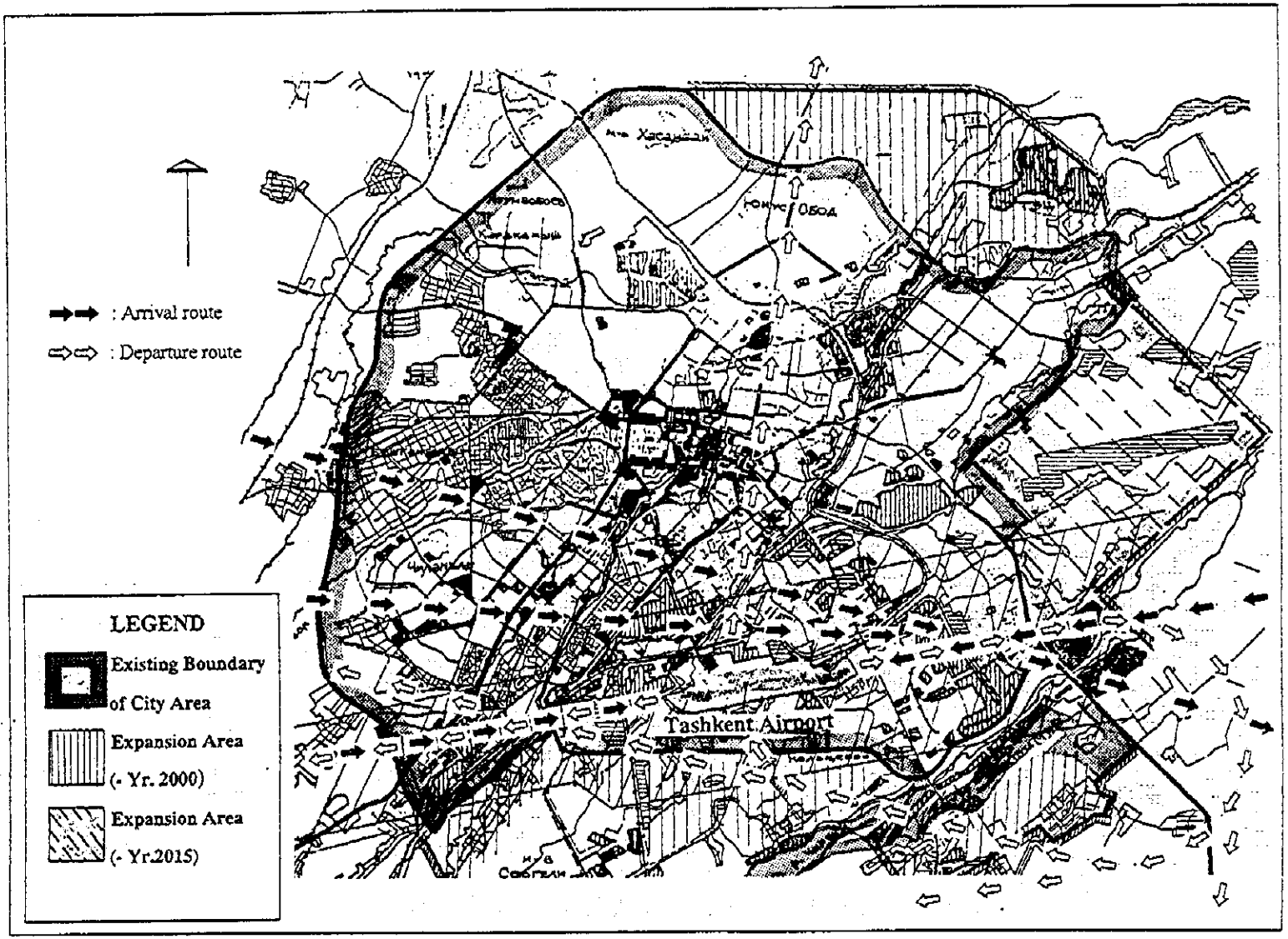
According to the expected increase in air traffic demand, the impact of aircraft noise to the residential area will become more serious, and therefore, an extension of the runway is not considered desirable.

In addition, the present approach and departure courses are crossing over the southern part of Tashkent city, therefore, the impact of aircraft noise will expand to a larger area of the city in the future. Nevertheless, the existing runway will not be extended.

b) Interference of Development of Tashkent City

According to the long-term Tashkent city development plan up to 2015 shown in **Fig. 4.5.1**, the urban area is planned to expand largely to the east and south of the city. Consequently, the existing Tashkent airport will be surrounded by an urbanized area so that the existence of the airport is expected to hamper the regular development of the city.

Fig. 4.5.1 Tashkent City Development Plan

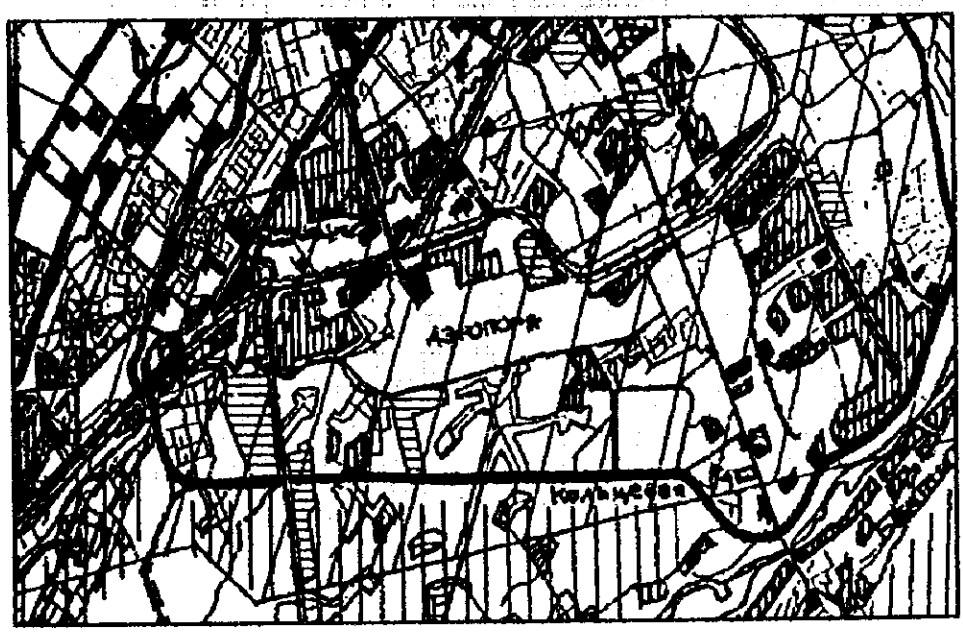


c) Geographical Difficulty in Expansion of Tashkent City

As shown in **Fig. 4.5.2**, the existing Tashkent airport is located about 5 km from the city center, and within an urbanized high density residential area. On the east side of the runway, there is a river and the residential area extends to the banks of this river. The west side of the runway is also surrounded by a river and a residential area.

Consequently, it is extremely difficult to extend the runway in both directions to meet the requirements for the operation of large aircraft such as B-747, from the economical and social aspects, such as costs of diversion of river flow and roads, and necessity for removal and compensation of residents.

Fig. 4.5.2 Circumference of Existing Tashkent Airport



(2) Development Plan of Metropolitan Airport

Judging from the above circumstances, in the long-term development plan of airports for the Capital, construction of a new metropolitan airport is considered as an alternative solution. However, special attention should be paid to the magnitude of the investment cost required for a provision of new airport and sufficient capacity of the existing airport facilities.

According to the results of air traffic demand, runway capacity of the existing Tashkent airport is capable of accommodating demand up to 2020. Therefore, a long-term development plan for the metropolitan airport is studied in the following two cases:

Case 1: **Development Plan of the Existing Airport**

At a maximum degree, the existing airport facilities will be used with necessary rehabilitation and improvements, except runway extension. Maximum design aircraft is to be B767.

Case 2: **Construction of New Airport**

New airport is to be constructed stage by stage, considering the investment cost.

Table 4.5.7(1) Facility Requirements of Existing Tashkent Airport (Case-1)

Item			Tashkent					
			1995	2000	2005	2010	2015	2020
Demand	Annual Pssenger ('000) one way	International	-	512	734	963	1,194	1,410
		CIS&Baltic	-	556	809	1,069	1,360	1,654
		Domestic	-	786	927	1,079	1,241	1,411
		Total	1,749	1,854	2,470	3,111	3,795	4,475
	Annual Cargo (ton)	International	-	15,285	20,771	27,670	32,294	37,210
		CIS&Baltic	-	4,908	7,830	10,953	14,310	17,807
		Domestic	-	904	1,753	2,668	3,642	4,669
		Total	14,470	21,097	30,354	41,291	50,246	59,686
	Annual Aircraft Movement ('000)	International Pax	-	3.6	5.0	6.6	8.2	9.6
		Medium-Jet	-	3.6	5.0	6.6	8.2	9.6
		Large-Jet	-	-	-	-	-	-
		CIS&Baltic Pax	-	5.6	7.8	9.7	11.8	14.5
		Mini-Plane	-	1.7	1.5	1.0	1.2	1.5
		Small-Jet	-	0.7	1.7	2.6	2.4	2.9
		Medium-Jet	-	3.2	4.6	6.1	8.2	10.1
		Large-Jet	-	-	-	-	-	-
		Domestic Pax	-	17.0	17.4	17.8	18.0	19.2
		Mini-Plane	-	11.1	9.1	5.9	6.6	7.6
		Small-Jet	-	5.8	7.6	11.0	7.8	6.3
		Medium-Jet	-	-	0.7	0.8	3.6	5.3
		Pax Total	-	26.2	30.2	34.1	38.0	43.3
		Cargo Freighter	-	0.9	1.2	1.6	1.9	2.3
		Total	34.8	27.1	31.4	35.7	39.9	45.6
	Peak Hour Aircraft Movement		-	13	15	16	18	20
	Plan Maximum Weight Aircrft	(Class)	IL86 Medium-Jet	IL86 Medium-Jet	IL86 Medium-Jet	IL86 Medium-Jet	IL86 Medium-Jet	IL86 Medium-Jet
		(Max.Weight)	215	215	215	215	215	215
	Peak Hour Passenger	Int'l	-	280	280	560	560	560
		CIS	-	420	420	560	700	700
		Domestic	-	350	630	700	700	700
Facility	Runway	length	4000	4000	4000	4000	4000	4000
		width	60	60	60	60	60	60
		Aircraft	IL86	IL86	IL86	IL86	IL86	IL86
	Runway Strip	length	4120	4120	4120	4120	4120	4120
		width	300	300	300	300	300	300
	Taxiway	System	Partial Parallel	Full Parallel	Full Parallel	Full Parallel	Full Parallel	Full Parallel
		Max width	21-22.5	23	23	23	23	23
	Apron	Large-Jet	1	0	0	0	0	0
		Medium-Jet	35	10	14	18	22	27
		Small-Jet	26	4	4	7	5	4
		Mini-Plane	0	7	6	4	4	5
		Total	62	21	24	29	31	36
		Freighter	-	2	2	3	4	4
	Passenger Terminal Bldg. ('000sqrm)	Int'l	39.5	4.2	4.2	8.4	8.4	8.4
		CIS		6.3	6.3	8.4	10.5	10.5
		Domestic	2.9	4.2	7.6	8.4	8.4	8.4
		Total	42.4	14.7	18.1	25.2	27.3	27.3
	Cargo Terminal Bldg. ('000sqrm)	Int'l	-	3.1	4.0	5.0	5.8	6.4
		CIS	-	1.8	2.1	2.3	2.9	3.5
		Dom.	-	0.5	0.6	0.6	0.7	0.7
		Total	4.3	5.4	6.6	8.0	9.4	10.6

Table 4.5.7 (2) Facility Requirements of Both Airports (Case-2)

Item		Tashkent				New Tashkent		
		1995	2000	2005	2010	2010	2015	2020
Annual Passengers (Departure only)	International		512	731		963	1,191	1,110
	CIS & Baltic		556	809		1,069	1,300	1,651
	Domestic		786	927	1,079		1,211	1,111
	Total	1,749	1,854	2,470	1,079	2,032	3,795	4,475
Annual Cargo (tons)	International		15,285	20,771		27,670	32,291	37,210
	CIS & Baltic		1,908	7,830		10,953	14,310	17,807
	Domestic		901	1,753	2,668		3,612	4,669
	Total	14,470	21,097	30,354	2,668	38,623	50,216	59,686
Peak-Hour Passengers	International		280	280		770	770	770
	CIS & Baltic		420	420		770	1,050	1,050
	Domestic		350	630	700		700	700
Annual Aircraft Movements	International		3,400	4,900		6,400	7,800	9,400
	Medium Jet		3,400	4,900		5,800	7,200	8,600
	Large Jet					600	600	800
	CIS & Baltic		5,300	7,400		9,000	11,100	13,400
	Mini- Plane		1,700	1,500		1,000	1,300	1,500
	Small Jet		700	1,600		2,100	2,300	2,700
	Medium Jet		2,900	4,300		4,900	6,700	8,200
	Large Jet					700	800	1,000
	Domestic		16,900	17,400	17,700		18,000	19,200
	Mini- Plane		11,100	9,100	5,900		6,600	7,600
	Small Jet		5,800	7,600	11,000		7,800	6,300
	Medium Jet			700	800		3,600	5,300
	Subtotal	17,400	25,600	29,700	17,700	15,400	36,900	42,000
	Freighter		900	1,200		1,600	1,900	2,300
	Total		26,500	30,900	17,700	17,000	38,800	44,300
Peak-Hour Aircraft Movements			13	15	8	8	18	20
Planned Maximum Aircraft		B-86	IL-86	IL-86	IL-86	B-747-100	B-747-100	B-747-100
	Type	Med. Jet	Med. Jet	Med. Jet	Med. Jet	Large Jet	Large Jet	Large Jet
	Max. Weight	215	215	215	215	395	395	395
Runway	Length	1,000	1,000	1,000	1,000	1,300	1,300	1,300
	Width	60	60	60	60	60	60	60
Runway Strip	Length	1,120	1,120	1,120	1,120	1,120	1,120	1,120
	Width	300	300	300	300	300	300	300
Taxiway	System	Partial Parallel	Full Parallel	Full Parallel	Full Parallel	Full Parallel	Full Parallel	Full Parallel
	Max. Width	22.5	23.0	23.0	23.0	23.0	23.0	23.0
Required Parking Stands for Apron	Large Jet	1				1	5	6
	Medium Jet	35	10	11	2	11	17	20
	Small Jet	26	1	1	6	1	5	1
	Mini-Plane	0	7	6	3	1	1	5
	Subtotal	62	21	24	11	17	31	35
	Freighter		2	2		3	1	1
Required Area for Passenger Terminal Building	International	39,500	4,200	4,200		11,600	11,600	11,600
	CIS & Baltic		6,300	6,300		11,600	15,800	15,800
	Domestic	2,900	4,200	7,600	8,400		8,400	8,400
	Total	42,400	14,700	18,100	8,400	23,200	35,800	35,800
Required Area for Cargo Terminal Building	International		3,100	4,000		5,000	5,800	6,400
	CIS & Baltic		1,800	2,100		2,300	2,900	3,500
	Domestic		500	600	640		700	700
	Total	4,300	5,400	6,700	640	7,300	9,400	10,600

4.5.3 Existing Tashkent Airport Development Plan (Case-1)

(1) Development Plan

At a maximum degree, the existing airport facilities will be used with necessary rehabilitation and improvements, except runway extension. Maximum design aircraft is to be B767. According to the air traffic demand forecast, B747 is expected to serve international routes, and required runway length is 4,400 m. However, as mentioned above, runway extension is quite difficult, and it is planned that B747 will be subject to some necessary operational restriction. Facility requirements based on the assumption that maximum aircraft is B767 is shown in **Table 4.5.7 (1)**.

Development of the existing airport is planned as shown in **Table 4.5.8**, and the general plan for 2020 is shown in **Fig. 4.5.3**.

Table 4.5.8 Development Plan of Existing Tashkent Airport

Item			Existing	1st stage (-2005)	2nd stage (2006-2010)	3rd stage (2011-2015)	4th stage (2016-2020)
Demand	Passenger ('000)		1,750	2,500	3,100	3,800	4,700
	Max. Aircraft		IL86(medium-Jet)	IL86/B767(Medium Jet)			
Development	Airfield	Runway Taxiway	4000m Partial	O Full Parallel			
		Pavement		O TWY Improvement O Apron Improvement		O RWY/TWY/APR overlay	
	Terminal	Pax. Bldg.		O Rehabilitation (International passenger building) O Expansion (Domestic passenger building)		O Rehabilitation (Dom. Int.)	
	Air-Nav			O VOR/DME, ASDE O Weather Radar		O Renewal	FANS O
Remark							

(2) Facility Planning

a) Runway

- Main Runway

Overlay work of the runway pavements has recently completed. It has enough strength (PCN 60/R/B/W/T) to operate medium class jets. No pavement of the runways will therefore be required in the short term. However, in the 3rd stage, a minimum overlay (8 cm thick) as maintenance of the runway surface will be required.

- Second Runway

The second runway (08R/26L) is 3,900 m long and 45 m wide, enough to accommodate medium class Jets for international flights, but installation of runway shoulders will be required.

Overlay work of the runway pavements was completed recently, having enough strength (PCN 50/R/B/W/T) to operate medium class jets, therefore, pavement of the runways is not required in the short term. However, in the 3rd stage, minimum overlay (8 cm thick) as maintenance of the runway surface will be required.

b) Taxiway

The existing parallel taxiway is not in conformity with ICAO regulations, and improvement is desirable.

Width of the taxiways is 21-22.5 m, widening work and 7.5 m-wide shouldering of the taxiways will be required for operation of medium class jets.

Strength of Taxiways No.1-No.6 paved with cement concrete is PCN 60-70/R/B/X/T. As the surface of the pavement is in a extremely deteriorated condition, overlay work of 20 cm-thick asphalt concrete will be required. Taxiways No.11-No.15 having a strength of PCN 50/F/C/Y/T, will also require an overlay with asphalt concrete of 10 cm thick.

c) Apron

Regarding the existing aprons, there are aprons for VIP use (2.2 ha), international flights (11.4 ha), and domestic flights (9.5 ha), having enough capacity for future demand. Only overlay work of the existing pavement will be required.

d) Terminal Area Facilities

- Passenger Terminal Building

Since the existing international and CIS passenger terminal building has a floor area of 39,500 m^2, and enough capacity for the required area of 27,300 m^2 for the year 2020, expansion will not be required, except rehabilitation work of the existing space.

Since the existing domestic passenger terminal building (2,920 m^2) will be saturated with the 2020 demand (required area : 8,400 m^2), expansion will be required. Recommendable expansion is towards the air side.

- Cargo Terminal Building

The existing cargo terminal building has a floor area of 4,300 m^2, and is not sufficient to the requirements (10,640 m^2) applicable to the year 2020, expansion will be needed. As there is no space for expansion on the landside, expansion of the cargo terminal building will be made toward the airside, but reallocation of the existing parking stands will be required.

- Car Parks

Existing car park area (10,000 m^2) is not enough for the requirements of the year 2020 (54,950 m^2), so expansion is planned to be made towards the east side of the existing car parks.

- Control Tower and Operation Building

The existing control tower and operations building was renewed in 1996, and has enough capacity to serve the requirements up to 2020, because no extension of the runway, and installation of air navigation facilities are planned.

The existing fire fighting and rescue station is not enough for the space requirements up to 2020, and expansion is required.

- Aircraft Maintenance Area

Expansion of the existing aircraft maintenance area is required, because the existing area (21,300 m^2) is not enough for the requirements (29,300 m^2) for 2020.

- Aircraft Fuel Facilities

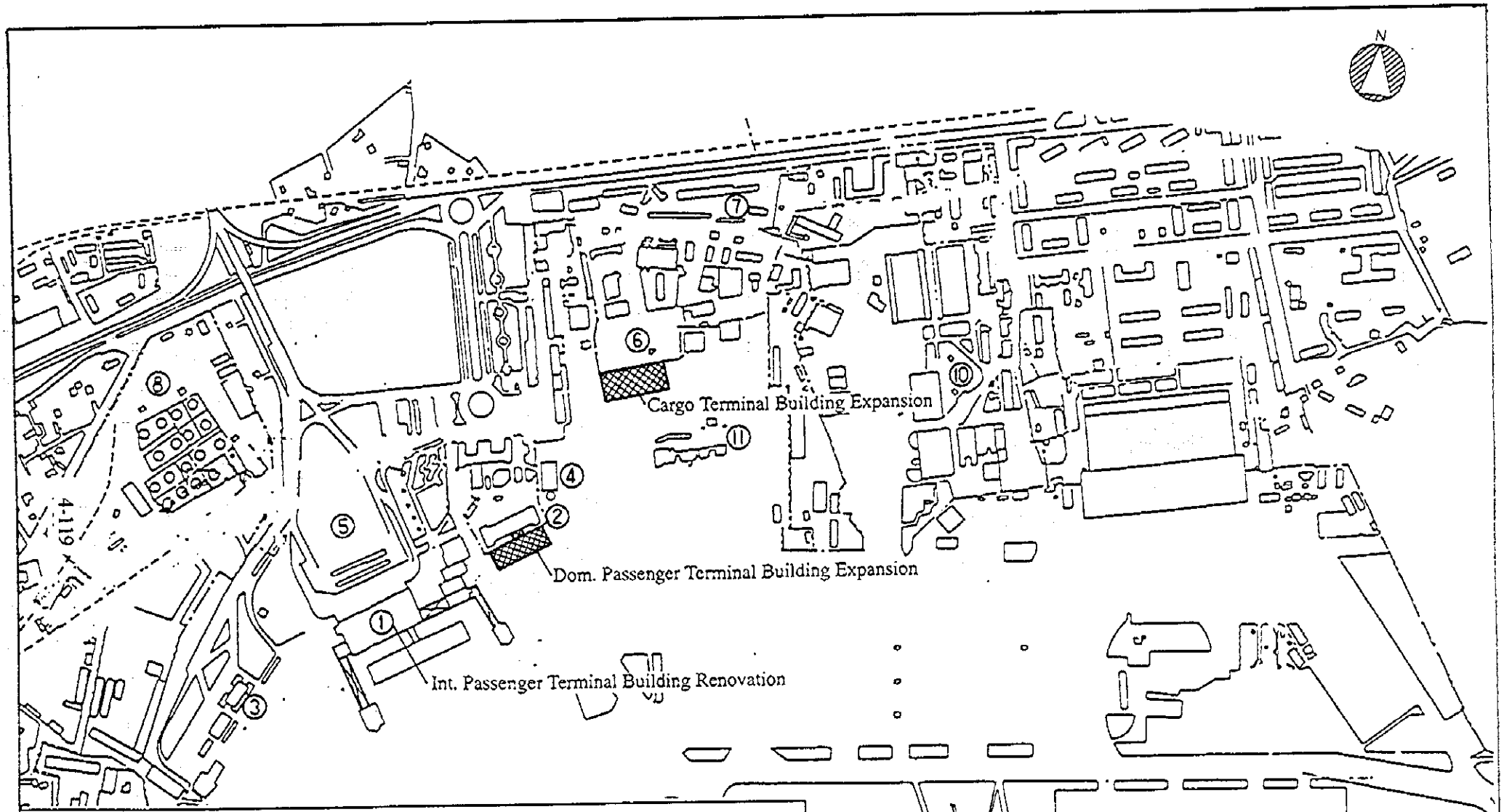
Expansion of the existing fuel storage facilities is not required, because the existing capacity (24,000 kl) is enough for the requirements (8,140 kl) for 2020.

- Other Facilities

Other facilities such as the VIP building, airport administration buildings will be used continuously without large investment for improvement.

e) Air Navigation Facilities and ATC System

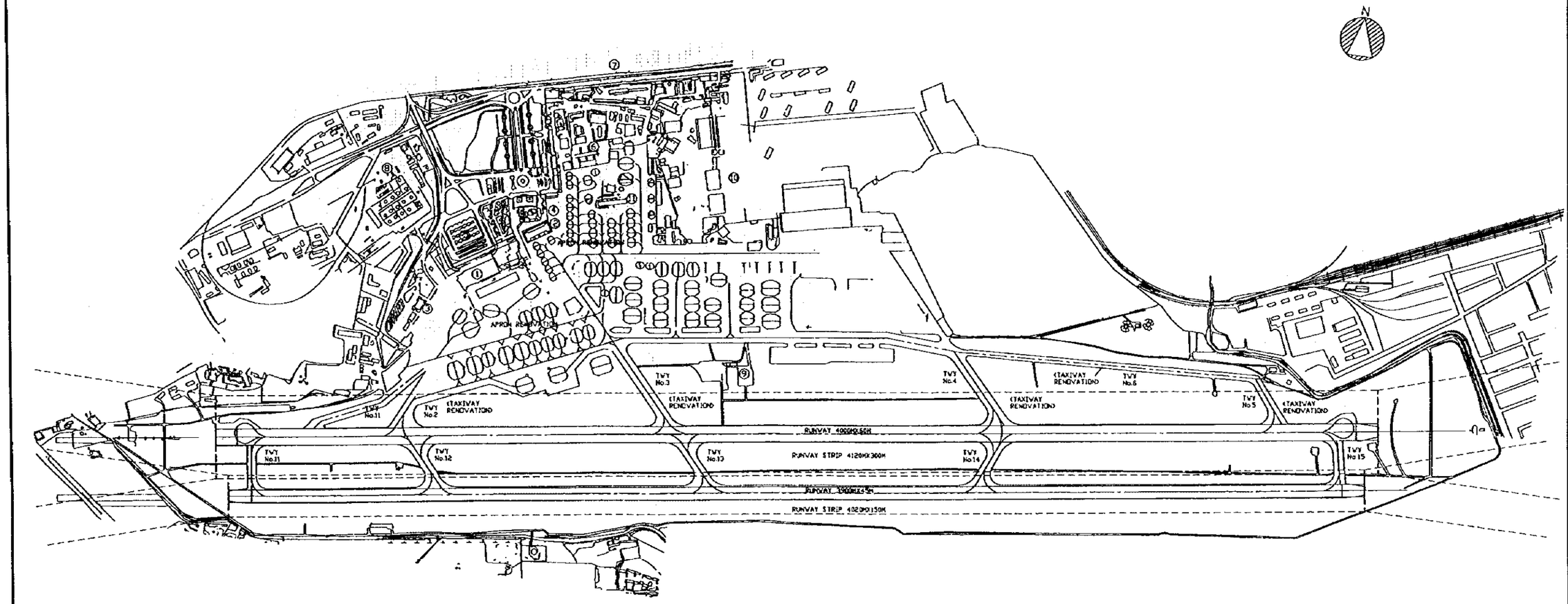
The development plan of air navigation facilities is summarized in Chapter 4.6, and the study on ATC system in Chapter 4.7 respectively.



TERMINAL AREA			
1	Int'l Passenger Terminal Building	8	Fuel Tank Farm
2	Dom. Passenger Terminal Building	9	Fire Station
3	VIP Building	10	Aircraft Maintenance Area
4	Control Tower and Operation	11	Aircraft Maintenance Office
5	Car Park		
6	Cargo Handling Area		
7	Administration Area		

Fig. 4.5.3 (1)

Tashkent Airport Terminal Area Layout Plan (S=1/8,000)



Facilities		Existing Facilities	1st stage (-2005)	2nd stage (2006-2010)	3rd stage (2011-2015)	4th stage (2016-2020)
Airfield	Runway	4000m				
	Taxiway	Partial	○ Full Parallel			
	Pavement		○ TWY Improvement ○ RWY/TWY/APR overlay ○ Apron Improvement			
Terminal	Pax. Bldg.		○ Rehabilitation (International passenger building) ○ Expansion (Domestic passenger building)			
Air-Navigation			○ VOR/DME, ASDE ○ Weather Radar FANS ○			

Fig. 4.5.3 (2) Tashkent Airport Development Plan (2020)

TERMINAL AREA			
1	Int'l Passenger Terminal Building	8	Fuel Tank Farm
2	Dom. Passenger Terminal Building	9	Fire Station
3	VIP Building	10	Aircraft Maintenance Area
4	Control Tower and Operation	11	Aircraft Maintenance Office
5	Car Park		
6	Cargo Handling Area		
7	Administration Area		

AIRPORT DATA			
Airport Name	Tashkent	Elevation	431m
Class	I	Reference Temperature	29°C
Province	Tashkent	Runway	4000mx60m
Main City	Tashkent		3900mx45m
Distance from city	6km south	Direction (True north)	N 82° E
Reference Point Coordinates	N 41° 15' 24" E069° 16' 24"	Instrument Runway	08L/08R/26R
		ILS Category	CAT-II

The Republic of Uzbekistan National Air Company "Uzbekistan Havo Yullari"			
The Study for The Air Transportation Development in The Republic of Uzbekistan			
Airport	Tashkent Airport		
Drawing Tittle	Airport Layout Plan (Year 2020)		
Date		Scale	

4.5.4 New Tashkent Airport Development Plan (Case-2)

(1) Development Plan

Functional distribution of the existing and new airports in Case-2 Development (Phased Construction of New Airport) is planned as shown in **Table 4.5.9**. The new airport is planned to open for operation at the 2nd Stage.

Table 4.5.9 Functional Distribution of Capital Airports

Airport	1st Stage (-2005)	2nd Stage (2006-2010)	3rd Stage (2011-2015)	4th Stage (2016-2020)
Tashkent	Improvement of Existing Facilities Domestic, CIS, International Flights	Domestic Flights only	Maintenance Facilities	
New Tashkent	Phase I Development	Phase II Development International, CIS Operation	All flight Operation	
Remarks	● Large Jet (B747)			

Preparation for the construction project of a new airport to serve only international and CIS flights shall start during the 1st stage, and its completion will be during the 2nd stage. The expansion project of the new airport to serve all flights from Tashkent shall follow during the 3rd Stage. After completion of the project, maintenance facilities and runway shall remain at the existing airport. Based on the above plan, the facility requirements for both the existing and new airports are summarized as shown in **Table 4.5.7 (2)**.

As shown in **Fig. 4.5.4**, the location of the possible site, selected by NAC, for construction of the new airport is an area situated 40 km southeast of Tashkent city, near Almazar village in Chinaz, and between the state road M-39 and railway lines.

The site has a generally flat topography, and has been developed as agricultural land for cotton. It is estimated that approximately 500 inhabitants live in the possible site area of 1,500 ha.

Development of the new airport is planned to be implemented in 2 phases. The First Phase will be to develop an airport serving international and CIS flights, and the Second Phase will include the facilities for domestic flights, as shown in **Table 4.5.10**. The general development plan for the year 2020 is shown in **Fig. 4.5.5**.

Fig.4.5.4 Location of New Tashkent Airport Site

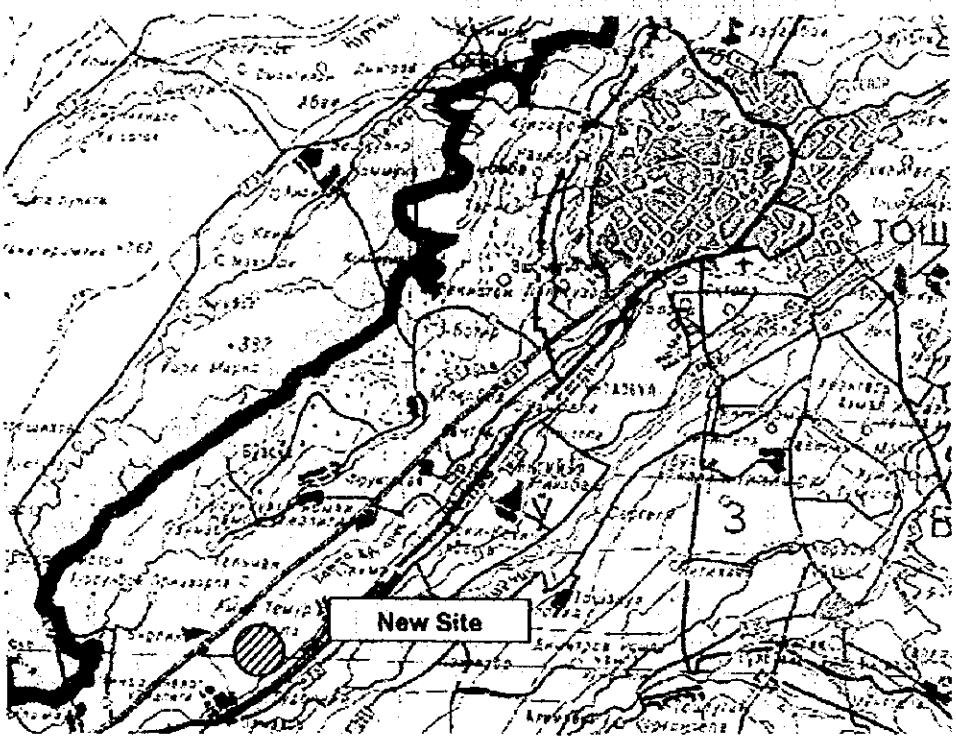


Table 4.5.10 Development of New Tashkent Airport (Class I)

Item			1st stage (-2005)	2nd stage (2006-2010)	3rd stage (2011-2015)	4th stage (2016-2020)
Demand	Passenger ('000)		2,000	3,800	4,700	
			=> (Int'l/CIS)		=>(Int'l/CIS/Dom.)	
	Max. Aircraft		O B747(Large-Jet)			
Development	Airfield	Runway	Phase I O 4,300m			
		Taxiway	Phase I O Full Parallel			
		Apron	Phase I O International & CIS Apron		O Domestic Apron	
	Terminal	Pax. Bldg.	Phase I O Int. bldg.		O Phase II Dom. Bldg.	
	Air-Nav		O Cat-II ILS, VOR/DME, ASR/SSR O ATC, Met, Airfield Lighting FANS O			
Remarks						

(2) Facility Planning

a) Runway

The length of the main runway is planned to be 4,300 m so that B-747 class aircraft will be able to operate without any operational restrictions. The layout of the runway is planned by considering the possibility of construction of a secondary runway, because the new airport should operate for 24 hours, and the secondary runway will be required for

maintenance of the main runway.

b) Taxiway

As for the taxiway system, a parallel taxiway is planned for Phase I development, and high-speed exit taxiway for Phase II development, due to mixed operation from mini plane to large jets, including domestic flights.

c) Apron

Parking stands are planned basically to be the "nose-in by own power/out by pusher" type, and their layout is to be of linear type, in accordance with the terminal building concept.

d) Terminal Area Facilities

- Passenger Terminal Building

Development of terminal area facilities is planned to be developed in two phases. Phase I development will include international and CIS passenger terminal building, and domestic passenger terminal building for Phase II.

The required floor area of the international and CIS passenger terminal building is estimated to be 27,400 m^2, and 8,400 m^2 for the domestic passenger terminal building.

Handling of international and CIS passengers is planned to take place two stories so as to separate the departing and arriving passengers flows.

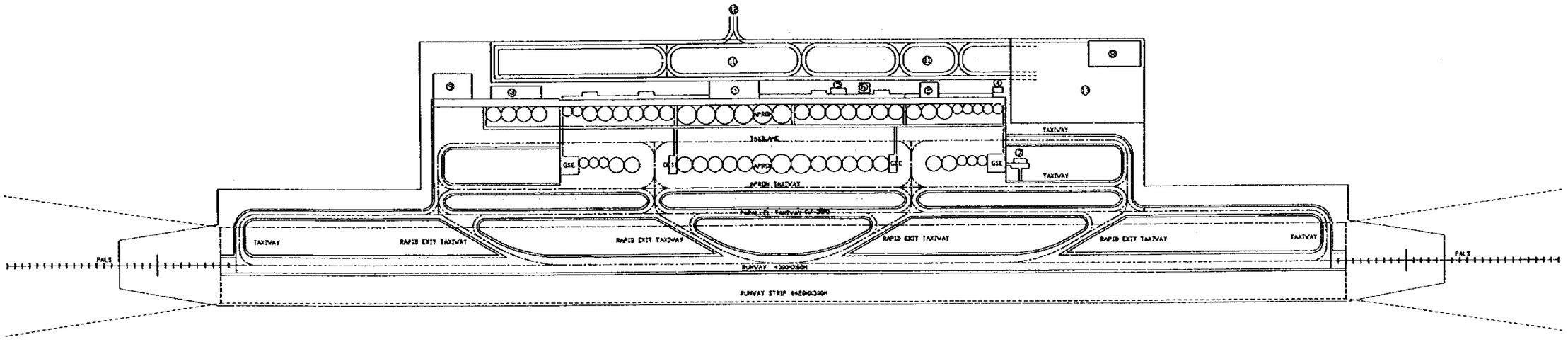
- Other Facilities

The control tower and operation building is planned to be located at the center part of the terminal area to permit direct visual recognition of the runway ends.

Other facilities such as car parks, cargo terminal building, fire fighting and rescue station, aircraft fuel facilities and aircraft maintenance facilities are planned on the basis requirements and functions.

(3) Air Navigation Facilities and ATC System

Air navigation facilities required for Cat-II ILS operation are planned for Phase I development. Terminal radar approach control for both the existing and new airports is planned to be stationed at the new airport. The detailed plan for the air navigation facilities and ATC systems are shown in Chapters 4.6 and 4.7 respectively.



Facilities		1st stage (-2005)	2nd stage (2006-2010)	3rd stage (2011-2015)	4th stage (2016-2020)
Airfield	Runway Taxiway	Phase I○ 4,300m Phase I○ Full Parallel			
	Apron	Phase I○ International & CIS Apron			○ Domestic Apron
Terminal	Pax. Bldg.	Phase I ○ Int. bldg.			○ Phase II Dom. Bldg.
Air-Navigation		○ Cat-II ILS, VOR/DME, ASR/SSR ○ ATC, Met, Airfield Lighting FANS ○			

0 100 200 300 400 500

Fig. 4.5.5 New Tashkent Airport Development Plan (2020)

TERMINAL AREA			
1	International Passenger Terminal Bldg	8	Fuel Tank Farm
2	Domestic Passenger Terminal Bldg.	9	Hanger
3	International Cargo Terminal Bldg.	10	International Car Park
4	Domestic Cargo Terminal Building	11	Domestic Car Park
5	Operation and Control Tower	12	Acsess Road
6	Power Station	13	Dormitory,Operation Center etc.
7	Fire and Rescue Station		

AIRPORT DATA			
Airport Name	New Tashkent	Elevation	(350m)
Class	I	Reference Temperature	-
Province	Tashkent	Runway	4300mx60m
Main City	Tashkent		
Distance from city	40km south-west	Direction (True north)	-
Reference Point	-	Instrument Runway	-
Coordinates	-	ILS Category	CAT-II

The Republic of Uzbekistan National Air Company "Uzbekistan Havo Yullari"			
The Study for The Air Transportation Development in The Republic of Uzbekistan			
Airport	New Tashkent Airport		
Drawing Tittle	Airport Layout Plan (Year 2020)		
Date		Scale	