

3. Work Procedure

3.1 General

The test equipment and procedure other than specified herein shall conform with the requirements described in ASTM.

3.2 Mechanical boring

(1) Mechanical boring

A total of 12 borings shall be carried out. The details of each borehole are shown in the following table.

Borehole number	Boring depth (m)		SPT (times)	Thin-wall tube sampling (samples)
	soil	rock		
B-1	25	5	25	
B-2	25	5	25	
B-3	25	5	25	
B-4	25	5	22	3
B-5	25	5	25	
B-6	25	5	23	2
B-7	25	5	25	
B-8	25	5	22	3
B-9	25	5	25	
B-10	25	5	23	2
B-11	25	5	25	
B-12	25	5	25	
Total	300	60	290	10

Diameter of boreholes shall be more than 86 mm. Every effort should be made for 100 % core recovery.

Elevation survey

Before and after boring works, survey of the ground elevation in each borehole shall be conducted by the Contractor at his own equipment and expense. Expenses for the elevation survey are deemed to be included in relevant items of work in the Bill of Quantities.

(2) Standard Penetration Test

Standard penetration test with split-barrel sampling (disturbed sample) shall be carried out at every one (1) meter or every changed stratum of depth in order to evaluate the

mechanical strength of ground.

(3) Thin-wall tube sampling

This sampling shall be conducted for a soft soil. Sampling points shall be determined under the discussion between the Consultant and the Contractor. This sample shall be kept a natural condition and used for the laboratory test of triaxial compression test and consolidation test.

(4) Others

Contractor has to prepare less than 3 numbers of the boring machine to complete the Works in the short period.

3.3 In-situ tests

(1) Detection of unexploded bombs

This investigation shall be conducted at each boring sites (1m²x12 sites) before the commencement of boring works. Magnetic survey method shall be adopted basically.

(2) Tests pit

Test pit shall be excavated at seven sites (T-1 to T-7) to conduct the undisturbed block sampling, disturbed soil sampling, plate bearing tests, and CBR tests. The size of test pit is as follows :

- width 1 meter,
- length 2 meters, and
- depth 2 meters.

(3) Undisturbed block sampling

The sample shall be obtained at the depth of 1.5 meters which is used for the laboratory tests of triaxial compression test and consolidation test.

This sample shall be concealed at once by a polyester and or other materials to keep a natural condition. It is also used for the laboratory test of triaxial compression test, consolidation test, and CBR test.

(4) Plate bearing test

Plate bearing test shall be conducted at the bottom of the test pit.

(5) Field CBR test

Field CBR test shall be conducted at the bottom of the test pit.

3.4 Laboratory test

Laboratory test consists of Triaxial compression test, Consolidation test, Compaction test, CBR test, and Physical property test. Physical property test is composed of Water content, Fine fraction content, Particle size, Liquid and Plastic limit, and Bulk density.

The details of laboratory tests are shown the following table.

Item	Number	Sample
Compression	17	10 from thin-wall sample for soft soil 7 from block sample for sandy soil
Consolidation	17	10 from thin-wall sample for soft soil 7 from block sample for sandy soil
Compaction	14	disturbed samples from test pit
CBR	21	7 from block sample 14 from disturbed samples from test pit
Water content	80	(ASTM D-2216) 10 from thin-wall sample 14 from block sample 14 from disturbed samples from test pit 46 from split barrel sample of SPT
Fine fraction content	80	(ASTM D-1140) ditto
Particle size	80	(ASTM D-854) ditto
Liquid and Plastic limit	80	(ASTM D-4318, D-427) ditto
Bulk density	80	(ASTM D-1556) ditto

Note) Thin-wall sample : undisturbed sample taken from borehole
Block sample : undisturbed sample taken from test pit
Split barrel sample : disturbed sample taken from SPT

4. Final Results

(1) General

The CONTRACTOR shall keep accurate mechanical boring log and records of all the work accomplished under this Contract and deliver complete legible copy of log and records to the CONSULTANT upon completion of the work or at such other time or times as he may be directed by the CONSULTANT. The CONSULTANT has the right to examine such records at any time prior to the CONTRACTOR'S delivery to the

CONSULTANT. All depth and elevations shall be measured in meter based on the ground level that will be indicated from time to time by the **CONSULTANT**.

(2) Records and photos

Records shall contain the following items.

Borehole logs

Borehole logs shall present a continuous record of borehole to the scale of 1/100 in vertical length containing the following information:

- Borehole number and location
- Elevation at the top of borehole
- Inclination and depth
- Model name of boring machine utilized
- Dates of boring
- Total core recovery
- Geological description of the borehole, including classification of soil, color etc.
- Results of the standard penetration test
- Water level in borehole
- Location of samples for laboratory tests and sounding test

Test pits

Sketch of soil occurrence in test pit, photos of all equipment used for the work, samples obtained in the test pits.

5. Preparation of Report

After the completion of laboratory tests, a final report summarizing all the work performed, findings, and recommendations for the work shall be prepared and submitted in original.

The report shall be properly bound in a folder and shall contain a description of the test procedure, number of tests performed, pit logs or maps, summary tables of the results and complete details of the test results both in tabular and graphical forms.

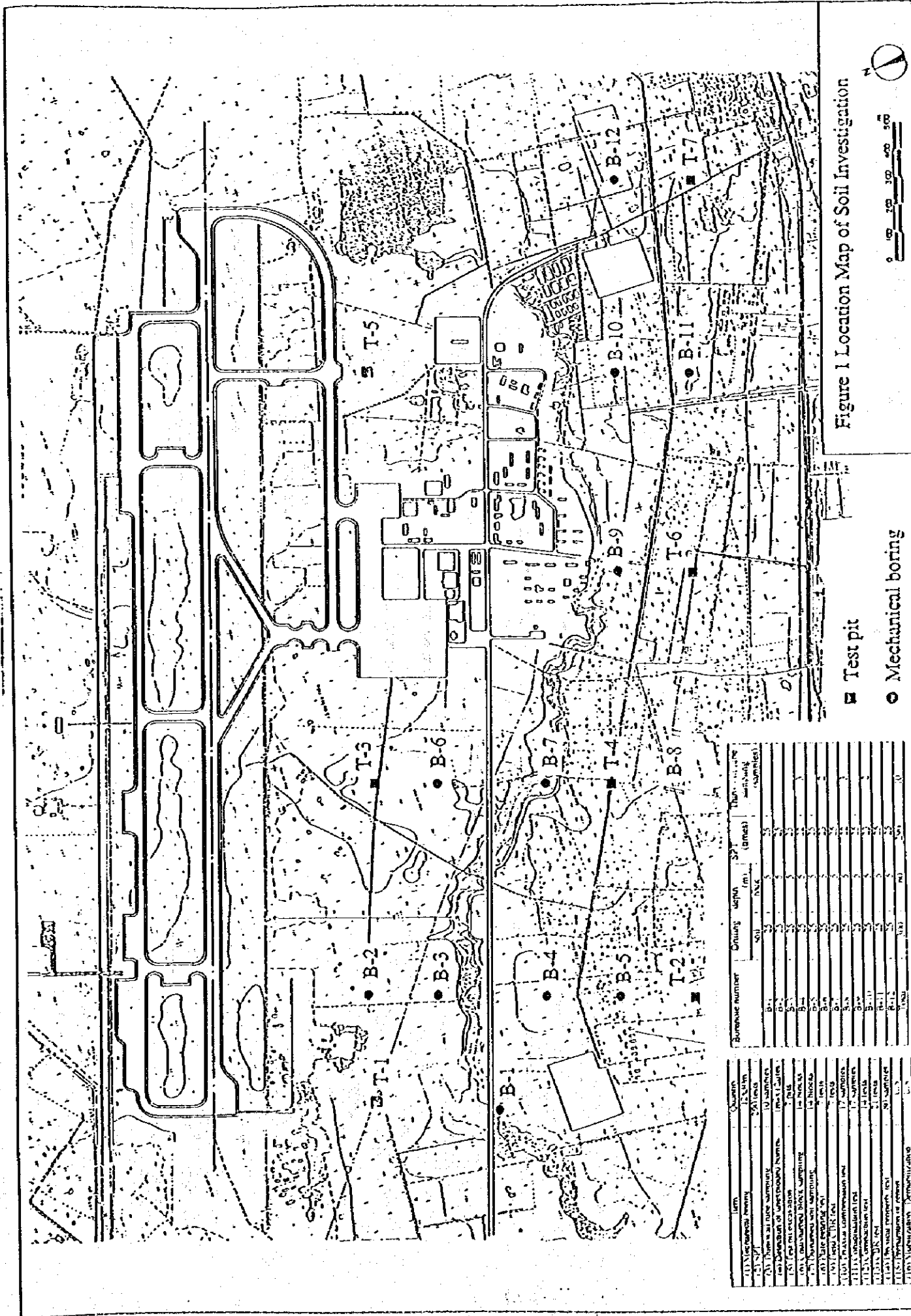
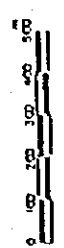


Figure 1 Location Map of Soil Investigation

■ Test pit
 ● Mechanical boring



Borehole Number	Drilling depth (ft.)		Test depth (feet)	
	Soil	Rock	Soil	Rock
B-1	1	1	1	1
B-2	1	1	1	1
B-3	1	1	1	1
B-4	1	1	1	1
B-5	1	1	1	1
B-6	1	1	1	1
B-7	1	1	1	1
B-8	1	1	1	1
B-9	1	1	1	1
B-10	1	1	1	1
B-11	1	1	1	1
B-12	1	1	1	1

Item	Quantity
1. Mechanical boring	12 borings
2. Test pits	12 test pits
3. Soil samples	10 samples
4. Distribution of Disturbed Sample	10 samples
5. Test pits for each zone	10 test pits
6. Mechanical boring sampling	12 borings
7. Soil samples	12 samples
8. Test pits	12 test pits
9. Soil samples	12 samples
10. Test pits	12 test pits
11. Soil samples	12 samples
12. Test pits	12 test pits
13. Soil samples	12 samples
14. Test pits	12 test pits
15. Soil samples	12 samples
16. Test pits	12 test pits
17. Soil samples	12 samples
18. Test pits	12 test pits
19. Soil samples	12 samples
20. Test pits	12 test pits
21. Soil samples	12 samples
22. Test pits	12 test pits
23. Soil samples	12 samples
24. Test pits	12 test pits
25. Soil samples	12 samples
26. Test pits	12 test pits
27. Soil samples	12 samples
28. Test pits	12 test pits
29. Soil samples	12 samples
30. Test pits	12 test pits
31. Soil samples	12 samples
32. Test pits	12 test pits
33. Soil samples	12 samples
34. Test pits	12 test pits
35. Soil samples	12 samples
36. Test pits	12 test pits
37. Soil samples	12 samples
38. Test pits	12 test pits
39. Soil samples	12 samples
40. Test pits	12 test pits
41. Soil samples	12 samples
42. Test pits	12 test pits
43. Soil samples	12 samples
44. Test pits	12 test pits
45. Soil samples	12 samples
46. Test pits	12 test pits
47. Soil samples	12 samples
48. Test pits	12 test pits
49. Soil samples	12 samples
50. Test pits	12 test pits

Fig.2 Tentative Work Schedule

13 April, 1995

Item of Work	April	May	June
1. Mechanical boring			
(1) preparation	██████████		
(2) Mobilization/Demobilization	██████████		
(3) Detection of unexploded bombs	██████████		
(4) Installation of drilling machine	██████████		
(5) Boring with SPT test. Sampling	██████████	██████████	
(6) Elevation survey and others		██████████	
2. In-situ test			
(1) Test pit excavation		██████████	
(2) Undisturbed block sample		██████████	
(3) Disturbed soil sampling		██████████	
(4) Plate bearing test		██████████	
(5) Field CBR test		██████████	
3. Laboratory test		██████████	
4. Preparation of report		██████████	
5. Submission of report			██████████

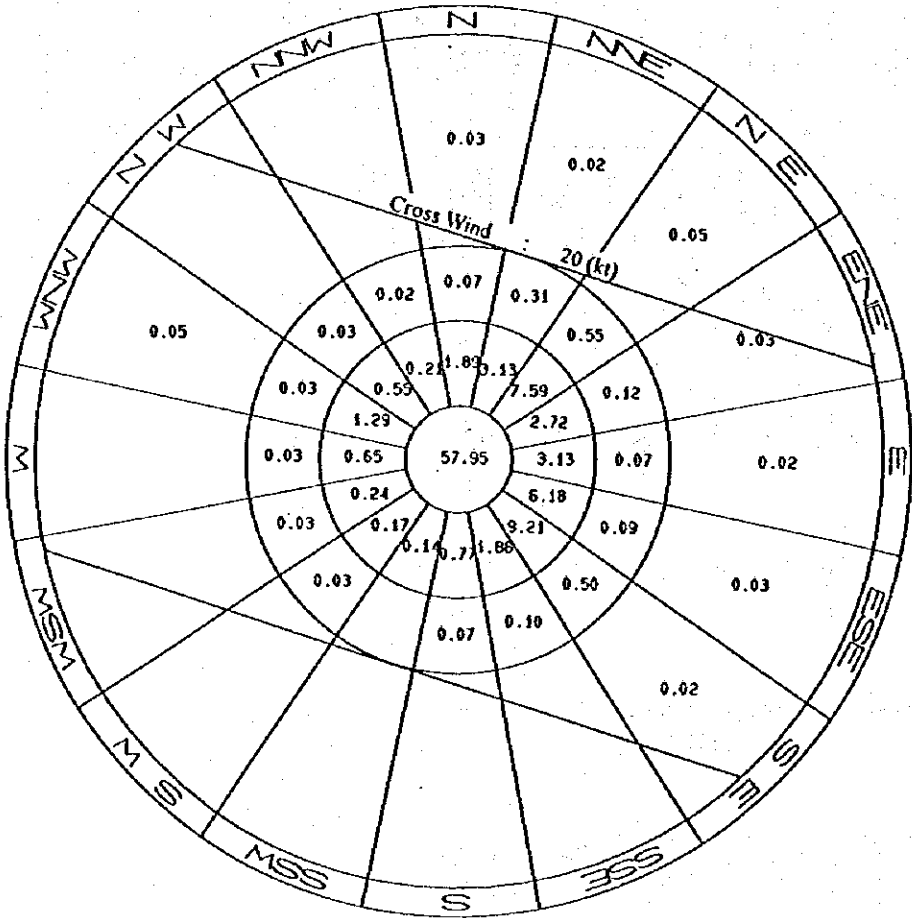
International Passenger Forecast for Whole Vietnam

Year	High Case			Medium Case			Low Case					
	GDP Growth Rate (%)	Elasticity	Pax Growth Rate (%)	Pax	GDP Growth Rate (%)	Elasticity	Pax Growth Rate (%)	Pax	GDP Growth Rate (%)	Elasticity	Pax Growth Rate (%)	Pax
1994	-	-	-	1,687,845	-	-	-	1,687,845	-	-	-	1,687,845
1995	9.50%	3.000	28.50%	2,168,881	9.50%	2.900	26.60%	2,136,812	9.50%	2.600	24.70%	2,104,743
1996	11.00%	2.646	29.10%	2,800,055	9.50%	2.471	23.48%	2,638,501	8.50%	2.297	19.53%	2,515,724
1997	11.00%	2.333	25.66%	3,518,643	9.50%	2.181	20.72%	3,185,280	8.50%	2.030	17.25%	2,949,752
1998	11.00%	2.057	22.63%	4,314,965	9.50%	1.925	18.29%	3,767,905	8.50%	1.793	15.24%	3,399,397
1999	11.00%	1.814	19.96%	5,176,137	9.50%	1.699	16.14%	4,376,220	8.50%	1.585	13.47%	3,857,242
2000	11.00%	1.600	17.60%	6,087,138	9.50%	1.500	14.25%	4,999,831	8.50%	1.400	11.90%	4,316,254
2001	10.00%	1.400	14.00%	6,939,337	9.00%	1.300	11.70%	5,584,811	8.00%	1.200	9.60%	4,730,614
2002	10.00%	1.400	14.00%	7,910,844	9.00%	1.300	11.70%	6,238,234	8.00%	1.200	9.60%	5,184,753
2003	10.00%	1.400	14.00%	9,018,362	9.00%	1.300	11.70%	6,968,108	8.00%	1.200	9.60%	5,682,489
2004	10.00%	1.400	14.00%	10,280,933	9.00%	1.300	11.70%	7,783,376	8.00%	1.200	9.60%	6,228,008
2005	10.00%	1.400	14.00%	11,720,263	9.00%	1.300	11.70%	8,694,031	8.00%	1.200	9.60%	6,825,897
2006	9.00%	1.200	10.80%	12,986,052	8.00%	1.200	9.60%	9,528,658	7.00%	1.200	8.40%	7,399,272
2007	9.00%	1.200	10.80%	14,388,545	8.00%	1.200	9.60%	10,443,410	7.00%	1.200	8.40%	8,020,811
2008	9.00%	1.200	10.80%	15,942,508	8.00%	1.200	9.60%	11,445,977	7.00%	1.200	8.40%	8,694,559
2009	9.00%	1.200	10.80%	17,664,299	8.00%	1.200	9.60%	12,544,791	7.00%	1.200	8.40%	9,424,902
2010	9.00%	1.200	10.80%	19,572,044	8.00%	1.200	9.60%	13,749,091	7.00%	1.200	8.40%	10,216,594
2011	8.00%	1.100	8.80%	21,294,383	7.00%	1.100	7.70%	14,807,771	6.50%	1.100	7.15%	10,947,081
2012	8.00%	1.100	8.80%	23,168,289	7.00%	1.100	7.70%	15,947,969	6.50%	1.100	7.15%	11,729,797
2013	8.00%	1.100	8.80%	25,207,099	7.00%	1.100	7.70%	17,175,962	6.50%	1.100	7.15%	12,568,477
2014	8.00%	1.100	8.80%	27,425,323	7.00%	1.100	7.70%	18,498,512	6.50%	1.100	7.15%	13,467,123
2015	8.00%	1.100	8.80%	29,838,752	7.00%	1.100	7.70%	19,922,897	6.50%	1.100	7.15%	14,430,023

$$(\text{Pax G/R}) = (\text{GDP G/R}) \times (\text{Elasticity}), \text{ Pax (n)} = (\text{Pax G/R}) \times \text{Pax (n-1)}$$

Analysis of Wind, Cloud Height and Visibility

Wind direction and velocity, cloud height and visibility at NBIA are analysed based on the meteorological data for the years 1993 and 1994. As a result of analysis, a wind rose and a cloud height and visibility matrix were prepared as shown below.



All Weather Wind Coverage: 99.89% (Cross Wind 20kt)

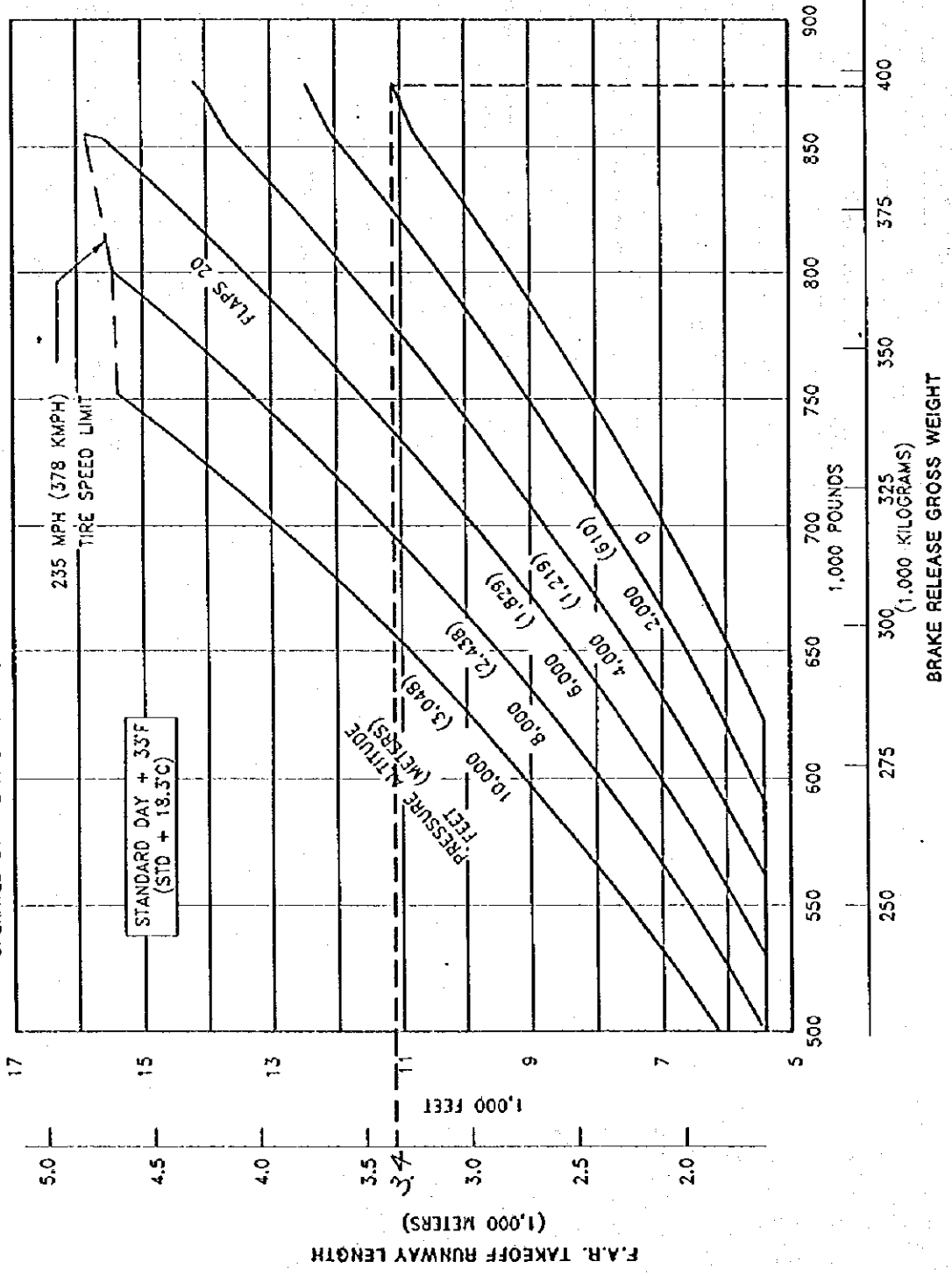
Figure A5.2.1 Wind Rose

Table A5.2.1 Cloud Height and Visibility Matrix

Cloud Height (ft)	Visibility (m)								Tot.
	0-400	- 800	-1200	-1400	-1600	-2400	-3200	3200-	
0- 100	0	0	0	0	0	0	0	1	1
- 200	0	0	0	0	0	0	0	0	0
- 300	4	4	1	0	1	0	7	7	24
- 400	2	3	22	10	4	5	7	7	60
- 500	0	1	8	4	6	16	3	2	40
- 600	2	0	7	8	11	11	17	12	68
- 700	0	1	4	4	9	4	9	9	40
- 800	1	1	2	7	13	25	36	38	123
- 900	0	0	7	6	8	29	43	96	189
- 1000	0	0	0	0	2	2	1	4	9
- 1100	0	0	3	9	16	45	104	638	815
- 1200	0	0	0	0	0	0	0	1	1
- 1300	0	0	1	2	2	10	21	369	405
- 1400	1	0	1	3	3	12	39	1,035	1,094
- 1500	0	0	0	0	0	0	0	0	0
1500 -	1	2	8	6	13	36	58	2,098	2,222
< 5/8	0	1	7	1	14	38	64	596	721
Total	11	13	71	60	102	233	409	4,913	5,812

Calculation of Take-off Runway Length at the Maximum Take-off Weight

- NOTES:
- CONSULT USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE AND OEW PRIOR TO FACILITY DESIGN
 - AIR CONDITIONING OFF, ONE PACK MAY BE OPERATED BY THE APU WITH NO THRUST PENALTY
 - ZERO RUNWAY GRADIENT
 - ZERO WIND



3.3.4 FAA TAKEOFF RUNWAY LENGTH REQUIREMENTS

STANDARD DAY +33°F (STD + 18.3°C)
 MODEL 747-400 (PW4056 ENGINES)

TABLE 41. AIRCRAFT PERFORMANCE, TAKEOFF (BOEING 747 SERIES)
JT9D-7A ENGINE, 10° FLAPS

MAXIMUM ALLOWABLE TAKEOFF WEIGHT (1000 LBS)

TEMP °F	AIRPORT ELEVATION (FEET)								
	0	1000	2000	3000	4000	5000	6000	7000	8000
50	785.0	785.0	785.0	763.0	742.5	720.0	697.5	675.5	653.5
55	785.0	785.0	785.0	763.0	742.5	720.0	697.5	675.5	653.5
60	785.0	785.0	785.0	763.0	742.5	720.0	697.5	675.5	649.0
65	785.0	785.0	785.0	763.0	742.5	720.0	696.1	668.5	641.5
70	785.0	785.0	785.0	763.0	742.5	714.8	686.6	659.3	632.9
75	785.0	785.0	785.0	763.0	732.9	704.0	676.2	649.3	623.3
80	785.0	785.0	781.1	750.5	721.0	692.5	665.0	638.6	613.1
85	785.0	785.0	767.7	737.7	708.6	680.5	653.5	627.4	602.4
90	785.0	784.5	754.2	724.7	696.0	668.4	641.7	616.1	591.6
95	785.0	770.5	740.7	711.6	683.5	656.3	630.1	604.9	580.9
100	785.0	756.7	727.4	698.8	671.2	644.4	618.7	594.0	570.4
105	772.9	743.3	714.4	686.4	659.3	633.1	607.9	583.7	560.6
110	759.5	730.3	702.0	674.6	648.1	622.5	597.9	574.2	551.5

W = 784.8 at 91.2°F, 39ft

REFERENCE FACTOR "R"

TEMP °F	AIRPORT ELEVATION (FEET)								
	0	1000	2000	3000	4000	5000	6000	7000	8000
50	68.3	72.4	76.7	81.6	86.9	92.9	99.5	106.9	115.2
55	69.0	73.0	77.4	82.3	87.8	93.9	100.6	108.1	116.3
60	69.7	73.7	78.1	83.0	88.5	94.6	101.4	109.0	117.5
65	70.2	74.3	78.7	83.7	89.2	95.4	101.9	110.7	120.8
70	70.8	74.9	79.4	84.3	89.9	96.4	104.5	113.7	124.3
75	71.3	75.6	80.1	85.0	91.5	98.9	107.3	116.9	127.9
80	71.9	76.2	81.0	87.1	94.0	101.6	110.3	120.3	131.6
85	72.5	77.3	83.2	89.5	96.6	104.6	113.6	123.9	135.5
90	73.8	79.4	85.4	92.0	99.4	107.7	117.1	127.6	139.6
95	75.7	81.4	87.7	94.6	102.3	110.9	120.7	131.6	143.9
100	77.7	83.5	90.0	97.2	105.3	114.3	124.4	135.7	148.3
105	79.9	85.8	92.5	100.0	108.4	117.8	128.4	140.0	
110	82.3	88.2	95.0	102.8	111.6	121.4	132.4		

R = 75.4 at 91.2°F, 39ft

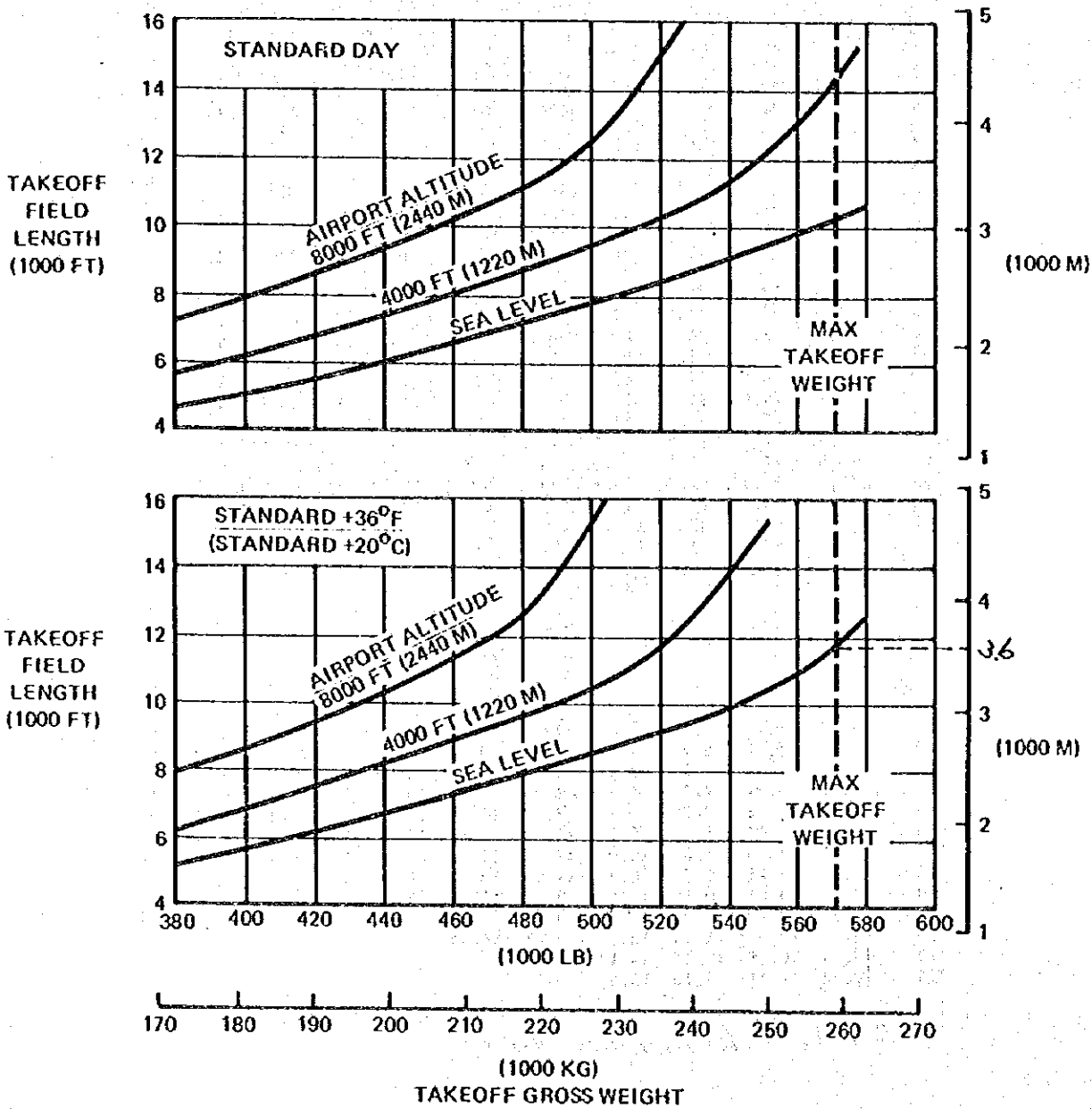
RUNWAY LENGTH (1000 FEET)

WEIGHT 1000 LBS	REFERENCE FACTOR "R"									
	60	70	80	90	100	110	120	130	140	150
550	4.43	5.15	5.85	6.52	7.18	7.82	8.46	9.09	9.72	10.36
570	4.73	5.51	6.27	7.02	7.74	8.46	9.17	9.87	10.58	11.29
590	5.04	5.90	6.73	7.55	8.35	9.14	9.92	10.70	11.48	12.27
610	5.39	6.31	7.22	8.11	8.99	9.86	10.72	11.58	12.45	13.31
630	5.76	6.76	7.74	8.71	9.67	10.62	11.57	12.52	13.47	14.43
650	6.15	7.23	8.29	9.34	10.39	11.44	12.48	13.52	14.57	15.61
670	6.57	7.73	8.87	10.02	11.17	12.31	13.45	14.60	15.74	
690	7.01	8.25	9.50	10.74	11.99	13.24	14.49	15.75		
710	7.47	8.81	10.16	11.51	12.87	14.24	15.61			
730	7.96	9.40	10.86	12.33	13.81	15.30				
750	8.46	10.01	11.59	13.20	14.81	16.44				
770	8.98	10.66	12.37	14.12	15.88					
790	9.52	11.34	13.20	15.09						

L = 11,240ft at R = 75.4, W = 784.8

NOTES:

- TAKEOFF THRUST
- ZERO RUNWAY SLOPE
- ZERO WIND
- A/C PACKS OFF
- JT9D-59A ENGINES



3.3 FAR TAKEOFF RUNWAY LENGTH REQUIREMENTS MODEL DC-10 SERIES 40 AND 40CF

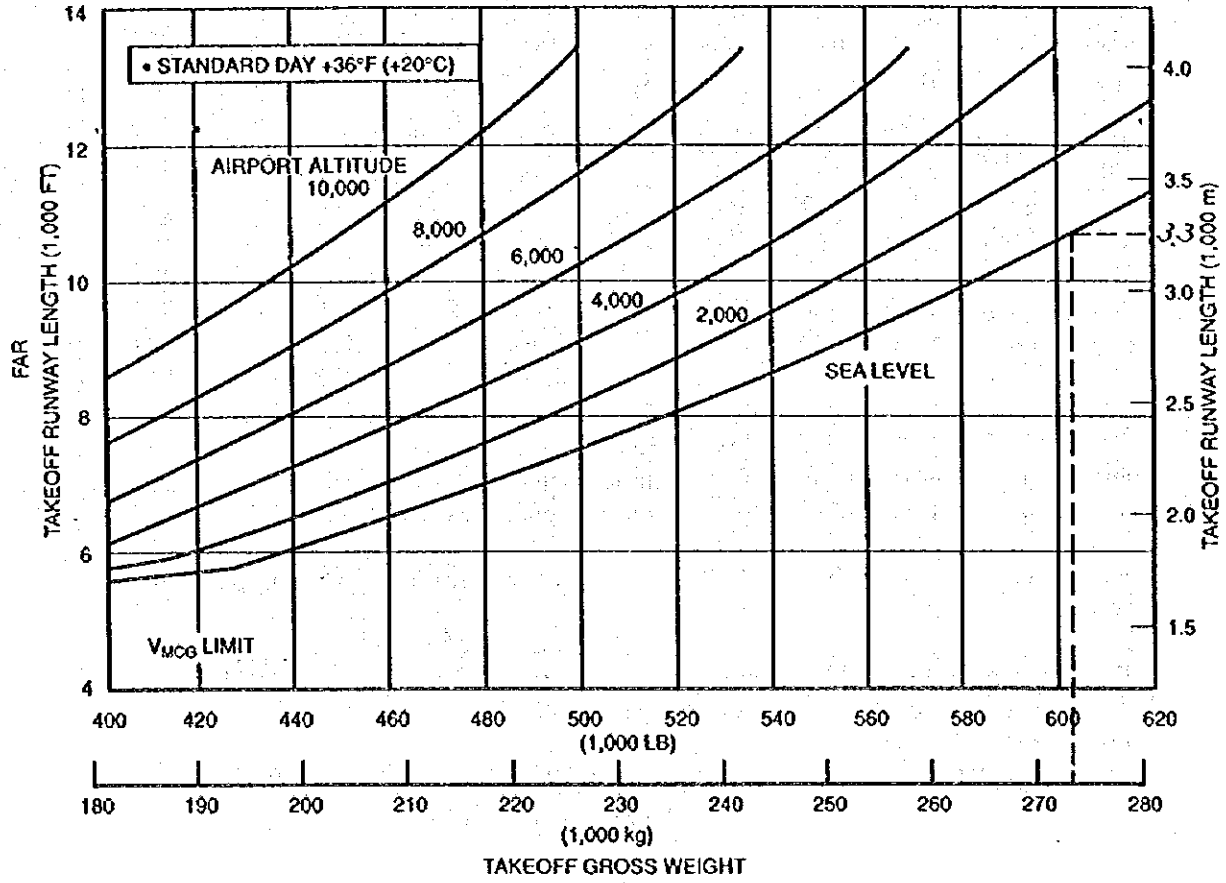
NOT TO BE USED FOR
FLIGHT PLANNING PURPOSES

PRELIMINARY

NOTES:

- ZERO WIND
- AIR CONDITIONING OFF

- PW4460 ENGINES
- ZERO SLOPE



OMC005-34

3.3.6 STANDARD DAY +36°F (+20°C)
MODEL MD-11 P&W ENGINES

REV A

TRAFFIC SURVEY - VEHICLE COUNT

1. Passenger Traffic Data

Flight schedule for the three days is shown in pages 2 through 4 together with the number of passengers carried. The numbers of arrival and departure passengers were totaled as follows. (See pages 2 through 4 for detail.)

Landside passenger flow volume was estimated, with some assumptions below.

	International	Domestic	
Arrival passengers	10 to 40 minutes	10 to 25 minutes	after plane arrived
Departure passengers	90 to 45 minutes		before time of departure

In this airport terminal, international and domestic buildings are located close. Therefore, the number of landside passengers is not figured out separately in the estimation hereinafter. Total of the landside passengers during 8:30 am and 5:00 pm (8.5 hours, while the survey was done) is counted as follows. (See pages 5 and 6.)

	26 April	27 April	28 April
Arrival passengers (both int'l & dom.)	1,477	1,067	1,253
Departure passengers (both int'l & dom.)	1,409	1,170	1,661
Total	2,886	2,237	2,914

2. Access Vehicle per Passenger per Day

Number of incoming vehicle in every one hour is given in pages 7 through 9. Access traffic is a mixture of various sizes of vehicles. All sizes of vehicle are converted into PCU.

The ratio of number of hourly access PCU (Passenger Car Unit) vs. hourly passenger (2-way) is gotten in the table below.

	26 April	27 April	28 April	Average
1. Passengers 8:30 ~ 17:00 (8.5 hours)	2,886	2,237	2,914	
2. Total number of access PCU from 8:30 through 17:00 (8.5 hours)	2,019	1,716	1,969	
Ratio 2. / 1.	0.70	0.77	0.68	0.72

$$[\text{Number of hourly access PCU}] = 0.7 \times [\text{Hourly passengers (2-way)}]$$

3. Parking Vehicles per Passenger per Hour

Number of parking vehicles is given in pages 10 through 12. Since these car parks (P-1, P-2 and P-3) are dominantly used by passenger-related cars, it can be said that the number of parking cars has relation to the number of passengers.

The ratio of number of car park slots required for small cars (private car + minibus + taxi) vs. hourly passenger (2-way, i.e. arrival + departure) is gotten in the table below.

	26 April	27 April	28 April	Average
1. Passengers 8:30 ~ 17:00 (8.5 hours)	2,886	2,237	2,914	
2. Average number of parking small cars	136.9	102.9	99.8	
Ratio 2. / (1 / 8.5)	0.40	0.39	0.29	0.36

$$[\text{Number of car park slots required}] = 0.4 \times \{ \text{Hourly passengers (2-way)} \}$$

4. Through Traffic Volume of Airport Access Road

Number of passing vehicle at the end of airport access toll road is given in pages 10 through 12. The road has traffic volume of about twice of passenger-related vehicles. It was observed that there is large traffic by commuting airport staff's motorcycles in the morning, evening and lunch time.

• Freighter and test flights are omitted.

<u>Date</u>	<u>Origin - No.</u>	<u>I</u>	<u>ETA</u>	<u>Aircraft</u>	<u>Seat</u>	<u>No. - Destination</u>	<u>I</u>	<u>E/D</u>	<u>Arr Pax</u>	<u>Load F.</u>	<u>Dep Pax</u>	<u>Load F.</u>	<u>Stay Time</u>
26 -				ATR72	66	VN249-HUI-SGN	I	6:30	54	82%	54	82%	NightStay
26 -				A320	150	VN2111-SGN		7:00	152	101%	152	101%	NightStay
26 -				TUI134	72	VN321-DAD-SGN		7:00	62	86%	62	86%	NightStay
26 -				A320	150	VN741-SGN-SIN	I	7:20	142	95%	142	95%	NightStay
26 SGN-VN210			9:00	A320	150	VN790-HKG	I	9:55	129	86%	134	89%	0:55
26 SGN-VN2100			9:10	A320	150	VN924-TPE	I	10:00	143	95%	99	66%	0:50
26 -				TUI134	72	VN821-VTE	I	10:30	31	43%	31	43%	NightStay
26 SGN-VN214			10:30	A320	150	VN831-BKK	I	11:30	136	91%	62	41%	1:00
26 DAD-VN312			10:40	TUI134	72	VN313-DAD		11:40	64	89%	63	88%	1:00
26 BKK-TG			12:20	A300	226	TG683-BKK	I	13:20	187	83%	225	100%	1:00
26 VTE-VN820			13:10	TUI134	72	VN315-DAD		14:00	17	24%	52	72%	0:50
26 -				ATR72	66	VN247-HUI-SGN		14:30	48	73%	48	73%	NightStay
26 SIN-SQ			13:45	A310	189	SQ175-SIN	I	14:45	106	56%	115	61%	1:00
26 SGN-VN222			15:00	B767	248	VN225-SGN		16:00	251	101%	250	101%	1:00
26 VIN-SU			14:15	IL62	132	SU542-VIN	I	16:50	90	68%	106	80%	2:35
26 HKG-VN791			15:30	A320	150	VN229-SGN		17:00	101	67%	143	95%	1:30
26 BKK-VN830			16:00	A320	150	VN231-SGN		18:00	67	45%	141	94%	2:00
26 HKG-CX			17:10	L1011	299	CX792-HKG	I	18:40	117	39%	56	19%	1:30
26 BKK-AF			17:35	A340	360	AF171-BKK-CDG	I	19:30	117	33%	128	36%	1:55
26 SGN-BL			18:30	B737	124	BL793-SGN		19:30	49	40%	126	102%	1:00
26 SGN-HUI-VN244			10:20	ATR72	66	-			59	89%			NightStay
26 SGN-HUI-VN246			13:50	ATR72	66	-			63	95%			NightStay
26 SGN-DAD-VN322			15:10	TUI134	72	-			64	89%			NightStay
26 DAD-VN314			17:20	TUI134	72	-			70	97%			NightStay
26 TPE-VN925			17:50	A320	150	-			117	78%			NightStay
26 SIN-SGN-VN740			18:30	A320	150	-			113	75%			NightStay

Today's total: Arr. 2,060 (68%) Dep. 2,189 (72%)

April 26 Wed.

• Freighter and test flights are omitted.

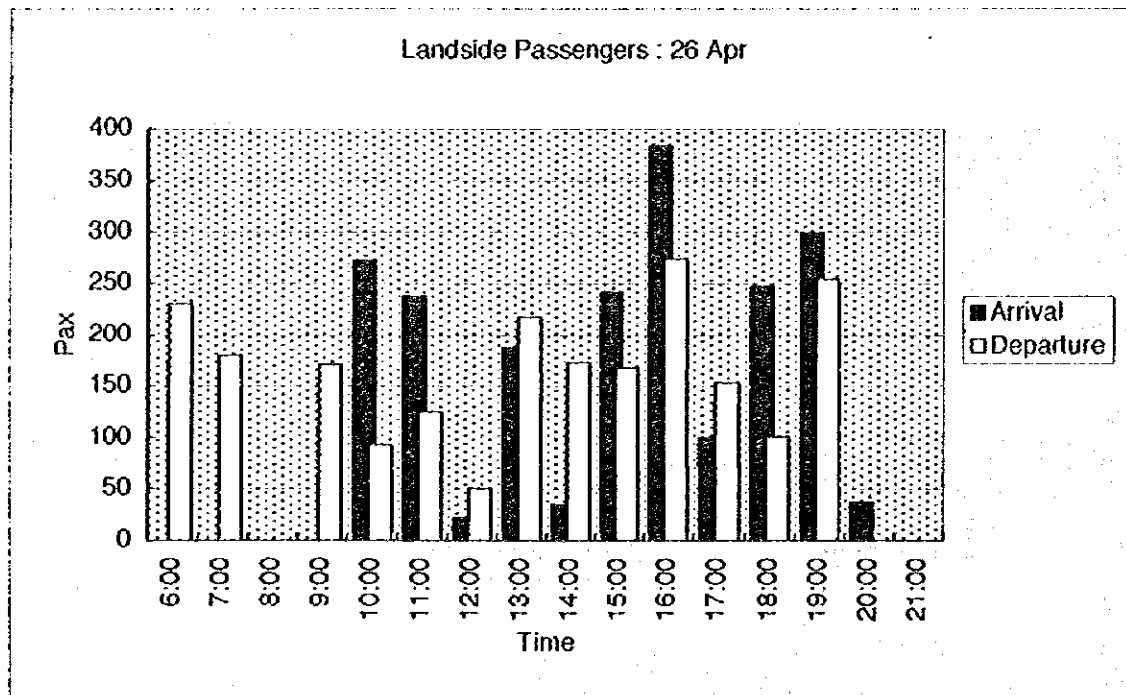
Date	Origin - No.	I	EIA	Aircraft	Seat	No.- Destination	I	ETD	Arr Pax	Load F.	Dep Pax	Load F.	Stay Time
27 -				ATR72	66	VN249-HUI	I	6:30			57	86%	NightStay
27 -				TUI34	72	VN311-DAD		7:00			40	56%	NightStay
27 -				A320	150	VN741-SGN		7:20			141	94%	NightStay
27 -				A320	150	VN211-SGN		8:00			145	97%	NightStay
27 -				YAK40	40	QV322-VTE	I	9:30			5	13%	NightStay
27	SGN-VN210		9:00	A320	150	VN790-HKG	I	10:15	133	89%	134	89%	1:15
27 -				TUI34	72	VN821-VTE	I	10:30			34	47%	NightStay
27	SGN-VN212		10:00	A320	150	VN831-BKK	I	11:30	129	86%	124	83%	1:30
27	DAD-VN310		10:40	TUI34	72	VN313-DAD		11:40	66	92%	35	49%	1:00
27	SGN-VN216		11:00	A320	150	VN217-SGN		12:00	150	100%	155	103%	1:00
27	HUI-VN244		10:20	ATR72	66	VN269-NHA		12:40	65	98%	60	91%	2:20
27	SGN-VN218		12:15	A320	150	VN219-SGN		13:00	60	40%	152	101%	0:45
27	SGN-VN218		12:45	A320	150	VN221-SGN		13:30	144	96%	145	97%	0:45
27 -				TUI34	72	VN315-DAD		14:00			50	69%	NightStay
27	HKG-VN704	I	15:55	A320	150	VN227-SGN		16:45	110	73%	142	95%	0:50
27	BKK-VN830	I	16:00	A320	150	VN229-SGN		17:30	115	77%	139	93%	1:30
27	SGN-VN		17:30	B737	124	BL791-SGN		18:30	112	90%	115	93%	1:00
27	SGN-VN226		17:00	A320	150	VN521-SGN		20:30	151	101%	38	25%	3:30
27	VTE-VN820	I	13:10	TUI34	72	-			40	56%			NightStay
27	DAD-VN312		15:10	TUI34	72	-			55	76%			NightStay
27	DAD-VN314		17:20	TUI34	72	-			54	75%			NightStay
27	SGN-VN2100		18:00	TUI34	72	-			63	88%			NightStay
27	SGN-VN740		18:30	A320	150	-			103	69%			NightStay
27	NHA-VN268		18:50	ATR72	66	-			52	79%			NightStay
<p>Today's total: Arr. 1,602 (81%) Dep. 1,711 (82%)</p>													
<p>April 27 Thu.</p>													

• Freighter and test flights are omitted.

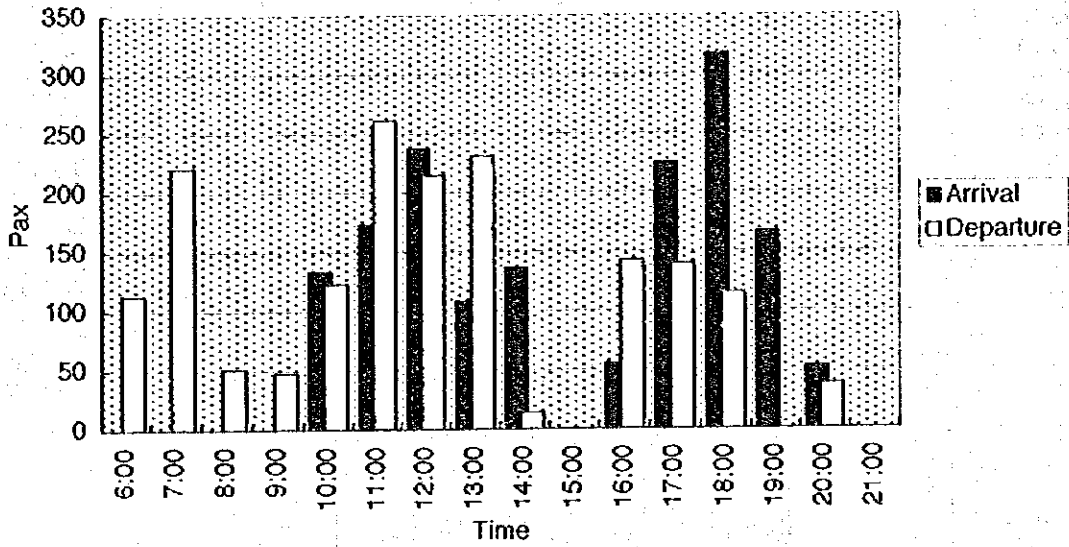
<u>Date</u>	<u>Origin - No.</u>	<u>I</u>	<u>EIA</u>	<u>Aircraft</u>	<u>Seat</u>	<u>No.-Destination</u>	<u>I</u>	<u>EID</u>	<u>Arr Pax</u>	<u>Load F.</u>	<u>Dep Pax</u>	<u>Load F.</u>	<u>Stay Time</u>
28 -				ATR72	66	VN249-HUI		6:30	37		37	56%	NightStay
28 -				TU134	72	VN311-DAD		7:00	60		60	83%	NightStay
28 -				A320	150	VN741-SGN		7:20	104		104	69%	NightStay
28	SGN-VN210		9:00	A320	150	VN790-HKG	I	9:55	105	70%	141	94%	0:55
28	SGN-VN2100		9:10	A320	150	VN2111-SGN		10:00	39	26%	150	100%	0:50
28	SGN-VN212		9:30	A320	150	VN217-SGN		10:30	77	51%	156	104%	1:00
28	SGN-VN918		9:35	TU134	72	VN918-CAN	I	10:35	9	13%	68	94%	1:00
28	HUI-VN244		10:20	ATR72	66	VN271-DIN		11:00	42	64%	29	44%	0:40
28	SGN-VN214		10:30	A320	150	VN831-BKK	I	11:30	133	89%	140	93%	1:00
28	DAD-VN310		10:40	TU134	72	VN313-DAD		11:40	69	96%	66	92%	1:00
28 -				TU134	72	VN315-DAD		14:00	47	65%	47	65%	NightStay
28	HUI-VN246		13:50	ATR72	66	VN247-HUI		14:30	53	80%	56	85%	0:40
28	SGN-VN220		14:00	B767	248	VN531-SGN		15:00	179	72%	184	74%	1:00
28	CAN-VN919		14:25	TU134	72	VN919-SGN		15:30	70	97%	0	0%	1:05
28	SGN-VN222		15:00	A320	150	VN225-SGN		16:00	39	26%	149	99%	1:00
28	HKG-VN791		15:30	A320	150	VN227-SGN		16:30	134	89%	144	96%	1:00
28	MOW-SU		14:15	IL62	132	SU542-SVO	I	16:50	49	37%	99	75%	2:35
28	SGN-VN274		15:30	A320	150	VN229-SGN		17:00	92	61%	152	101%	1:30
28	BKK-VN830		16:00	A320	150	VN231-SGN		18:00	114	76%	144	96%	2:00
28	SGN-BL		18:50	B737	124	BL791-SGN		19:50	103	83%	124	100%	1:00
28	DAD-VN312		15:10	TU134	72	-			49	68%			NightStay
28	DAD-VN314		17:20	TU134	72	-			56	78%			NightStay
28	DIN-VN270		17:30	ATR72	66	-			29	44%			NightStay
28	SGN-VN740		18:30	A320	150	-			97	65%			NightStay
April 28			Fri.										
									<u>Today's total: Arr. 1,538 (64%)</u>		<u>Dep. 2,050 (88%)</u>		
									<u>Three day's total: Arr. 5,200 (70%)</u>		<u>Dep. 5,950 (80%)</u>		
									<u>Apron occupancy</u>		<u>Three day's average:</u>		
											(excluding night stay)		
											Int'l	1:36	
											Dom.	1:07	
											All	1:15	

April 26 thru 28

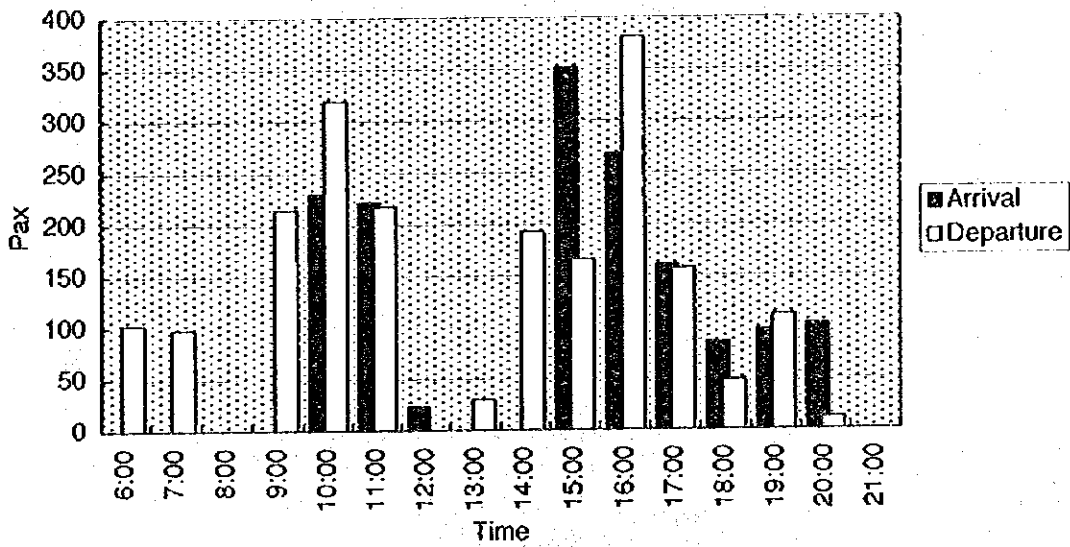
	26 Apr		27-Apr		28-Apr	
	Arrival	Departure	Arrival	Departure	Arrival	Departure
5:00 ~ 6:00	0	230	0	113	0	103
6:00 ~ 7:00	0	180	0	221	0	98
7:00 ~ 8:00	0	0	0	51	0	0
8:00 ~ 9:00	0	171	0	48	0	214
9:00 ~ 10:00	272	93	133	123	230	319
10:00 ~ 11:00	237	125	173	261	221	217
11:00 ~ 12:00	22	50	237	215	23	0
12:00 ~ 13:00	187	217	108	231	0	30
13:00 ~ 14:00	35	173	136	14	0	193
14:00 ~ 15:00	241	168	0	0	351	166
15:00 ~ 16:00	383	274	55	142	268	381
16:00 ~ 17:00	100	153	225	139	160	157
17:00 ~ 18:00	247	101	317	115	85	48
18:00 ~ 19:00	299	254	166	0	97	112
19:00 ~ 20:00	37	0	52	38	103	12
20:00 ~ 21:00	0	0	0	0	0	0
Total	2,060	2,189	1,602	1,711	1,538	2,050
8:30 ~ 9:00	0	156	0	45	0	198



Landside Passengers : 27 Apr



Landside Passengers : 28 Apr

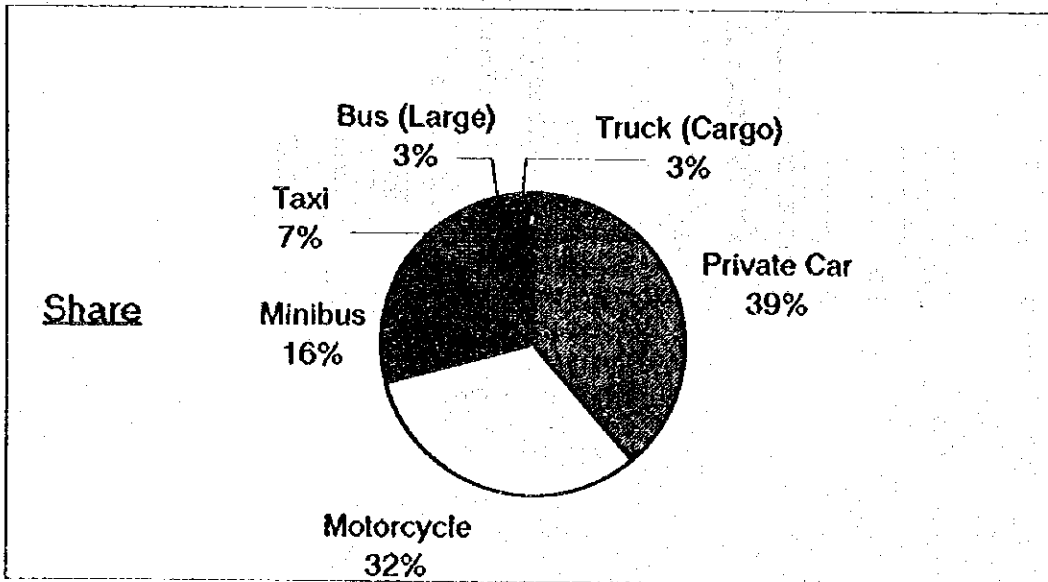
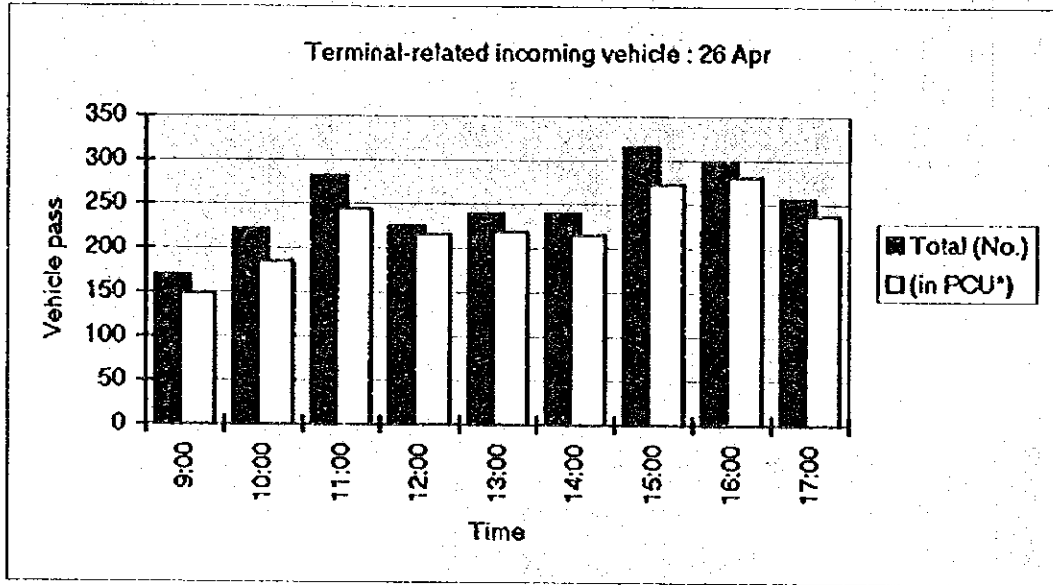


Terminal-related incoming vehicle = [Entrance(from East+ From West)]

	Private Car	Motorcycle	Minibus	Taxi	Bus (Large)	Truck (Cargo)	Others	Total (No.)	(in PCU*)
8:30 ~ 9:00	49	63	27	19	4	7	0	169	149
9:00 ~ 10:00	48	88	39	38	2	4	2	221	185
10:00 ~ 11:00	34	129	53	39	12	12	3	282	245
11:00 ~ 12:00	73	68	40	19	18	7	0	225	216
12:00 ~ 13:00	112	67	39	8	7	6	0	239	219
13:00 ~ 14:00	105	72	39	11	3	8	1	239	215
14:00 ~ 15:00	151	110	33	8	5	7	1	315	273
15:00 ~ 16:00	169	60	43	11	5	8	1	297	281
16:00 ~ 17:00	128	63	51	1	10	2	1	256	238
	869	720	364	154	66	61	9	Total	2,019

* Passenger Car Unit

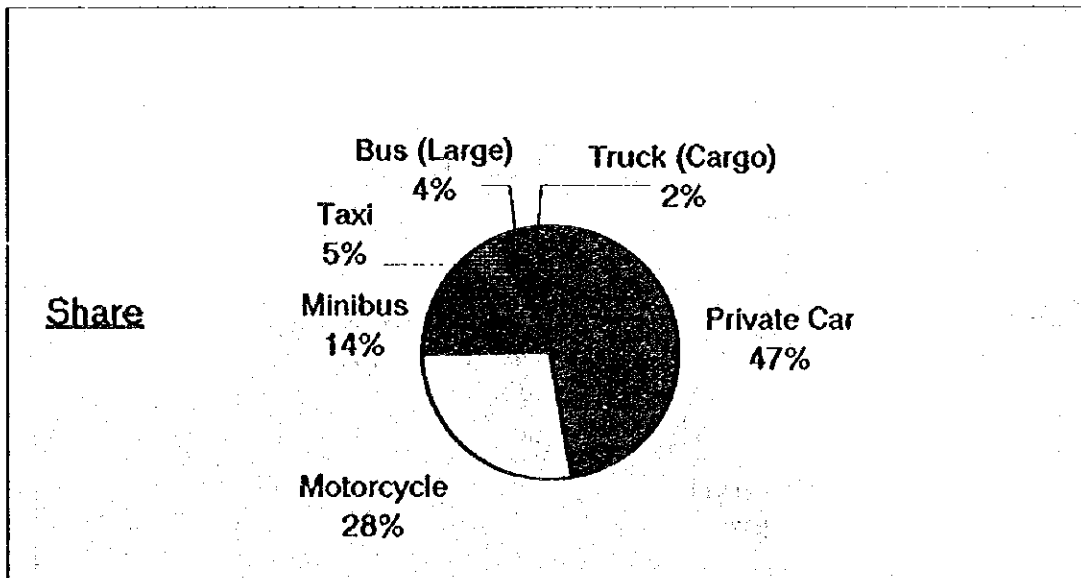
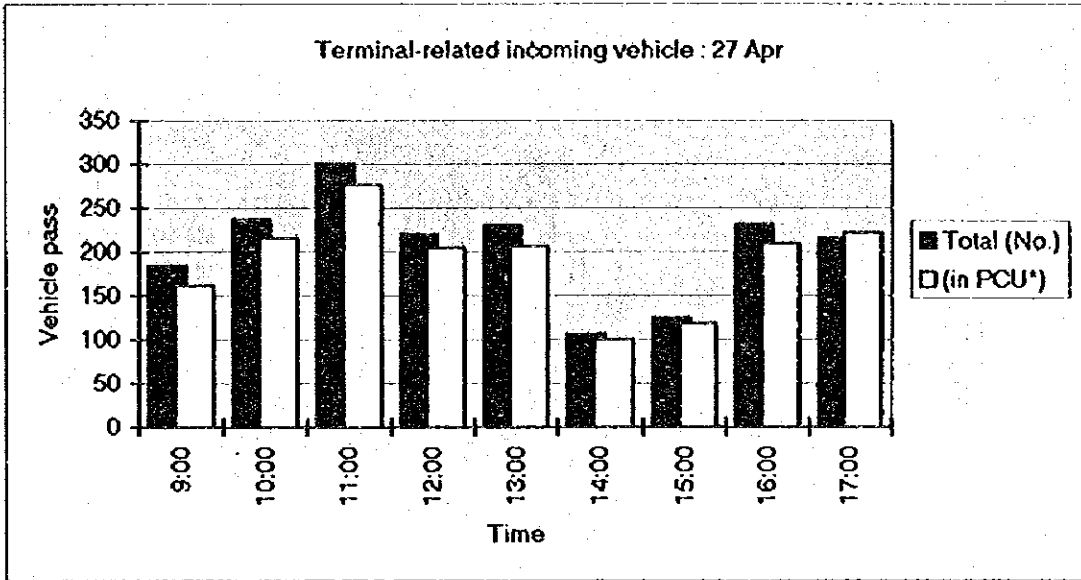
= [Private Car + Minibus + Taxi] + Motorcycle x 0.33
 + [Bus(Large) + Others] x 2.5 + Truck(Cargo) x 2.2



Terminal-related incoming vehicle = [Entrance(from East+ From West)]

	Private Car	Motorcycle	Minibus	Taxi	Bus (Large)	Truck (Cargo)	Others	Total (No.)	(in PCU*)
8:30 ~ 9:00	74	66	20	13	3	5	3	184	162
9:00 ~ 10:00	106	76	25	13	10	6	1	237	216
10:00 ~ 11:00	151	83	37	11	8	6	4	300	277
11:00 ~ 12:00	103	62	28	11	10	4	2	220	205
12:00 ~ 13:00	122	61	23	17	1	6	0	230	207
13:00 ~ 14:00	45	28	19	6	4	3	1	106	100
14:00 ~ 15:00	56	35	20	3	6	5	0	125	119
15:00 ~ 16:00	104	63	47	7	5	2	3	231	210
16:00 ~ 17:00	110	39	32	10	19	6	0	216	222
	871	513	251	91	66	43	14	Total	1,716

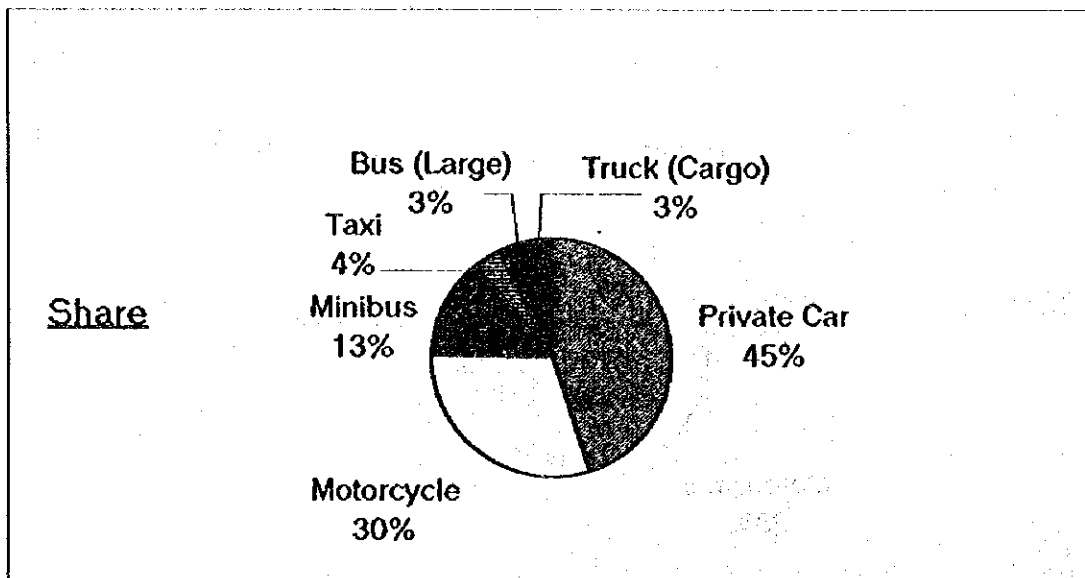
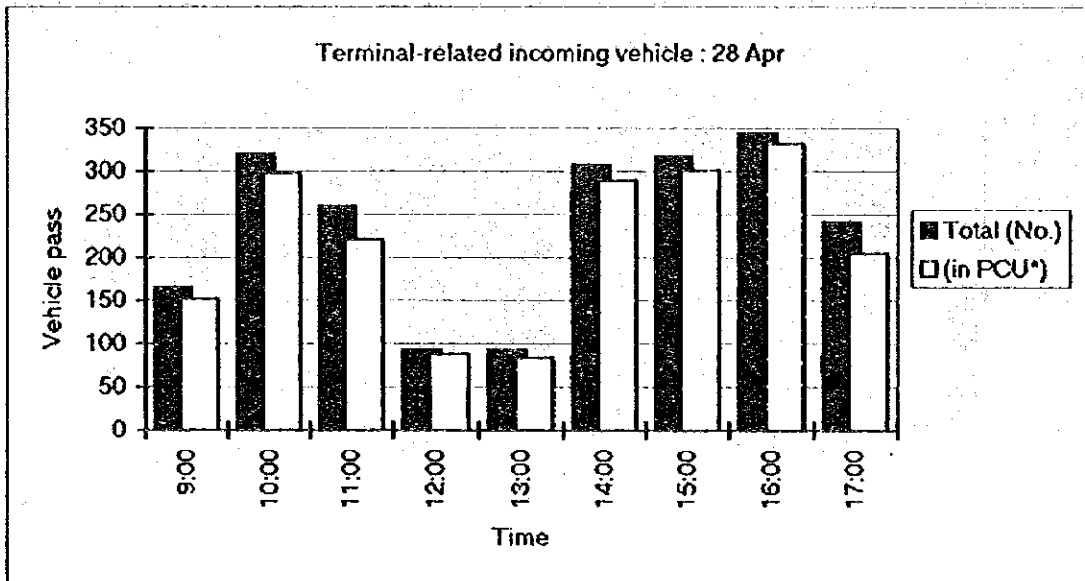
*: Passenger Car Unit
 = [Private Car + Minibus + Taxi] + Motorcycle x 0.33
 + [Bus(Large) + Others] x 2.5 + Truck(Cargo) x 2.2



Terminal-related incoming vehicle = [Entrance(from East+ From West)]

	Private Car	Motorcycle	Minibus	Taxi	Bus (Large)	Truck (Cargo)	Others	Total (No.)	(in PCU*)
8:30 ~ 9:00	79	48	19	8	6	4	1	165	152
9:00 ~ 10:00	169	79	48	7	9	7	1	320	298
10:00 ~ 11:00	93	111	26	12	8	9	0	259	221
11:00 ~ 12:00	11	49	10	3	11	7	2	93	89
12:00 ~ 13:00	35	32	14	5	4	2	1	93	84
13:00 ~ 14:00	142	86	42	12	6	15	4	307	289
14:00 ~ 15:00	169	68	45	17	9	7	2	317	301
15:00 ~ 16:00	185	74	49	11	11	10	4	344	332
16:00 ~ 17:00	80	103	34	9	5	9	1	241	205
	963	650	287	84	69	70	16	Total	1,969

*: Passenger Car Unit
 = [Private Car + Minibus + Taxi] + Motorcycle x 0.5
 + [Bus(Large) + Truck(Cargo) + Others] x 2.0



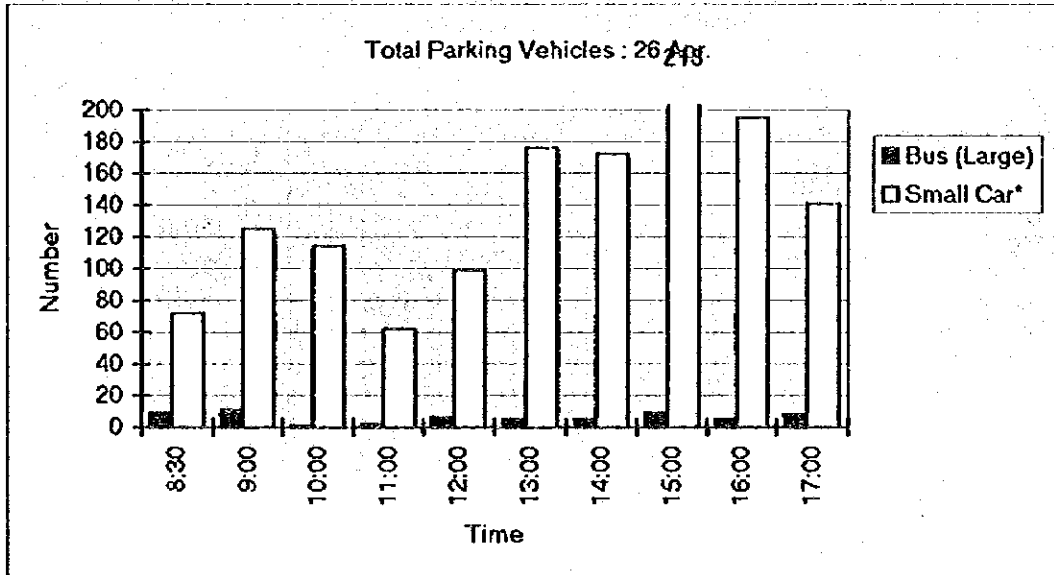
Total Parking Vehicles = [P-1 + P-2 + P-3]

	Private Car	Motorcycle	Minibus	Taxi	Bus (Large)	Truck (Cargo)	Others	Total (No.)	Small Car*
8:30	37	0	18	17	9	5	4	90	72
9:00	44	0	41	40	11	5	1	142	125
10:00	39	0	34	41	1	3	0	118	114
11:00	19	4	19	24	2	0	0	68	62
12:00	42	0	31	26	6	0	0	105	99
13:00	91	0	49	36	5	1	1	183	176
14:00	74	0	58	40	5	1	6	184	172
15:00	120	0	43	50	9	1	8	231	213
16:00	116	0	44	35	5	2	10	212	195
17:00	78	0	33	30	8	0	8	157	141

*Private Car + Minibus + Taxi

Average: 136.9

Needs for large bus slots in %: 2.4%



Thru traffic-East bound A [Road-1(from West)]-[Entrance(From West)]

	Private Car	Motorcycle	Minibus	Taxi	Bus (Large)	Truck (Cargo)	Others	Total (No.)	(in PCU*)
8:30 ~ 9:00	0	46	5	0	1	3	0	55	29
9:00 ~ 10:00	0	74	13	27	0	2	2	118	74
10:00 ~ 11:00	0	64	16	38	0	5	1	124	89
11:00 ~ 12:00	0	36	0	9	2	4	0	51	35
12:00 ~ 13:00	9	43	0	1	4	3	0	60	41
13:00 ~ 14:00	2	51	0	1	0	5	1	60	33
14:00 ~ 15:00	0	88	0	5	0	6	0	99	47
15:00 ~ 16:00	11	53	0	4	0	5	0	73	43
16:00 ~ 17:00	27	33	23	0	0	2	0	85	65

8:30 ~ 17:00

49 488 57 85 7 35 4 725 457

Thru traffic-West bound A [Road-2(from East)]-[Entrance(From East)]

	Private Car	Motorcycle	Minibus	Taxi	Bus (Large)	Truck (Cargo)	Others	Total (No.)	(in PCU*)
8:30 ~ 9:00	3	39	0	0	0	0	4	46	26
9:00 ~ 10:00	1	31	3	0	0	1	2	38	21
10:00 ~ 11:00	0	35	14	7	1	0	1	58	38
11:00 ~ 12:00	2	145	0	0	0	8	2	157	72
12:00 ~ 13:00	0	68	0	0	7	3	0	78	47
13:00 ~ 14:00	11	113	11	0	2	10	1	148	89
14:00 ~ 15:00	0	126	10	2	4	4	4	150	82
15:00 ~ 16:00	0	132	0	0	3	4	3	142	67
16:00 ~ 17:00	18	66	15	8	0	3	3	113	77

8:30 ~ 17:00

35 755 53 17 17 33 20 930 519

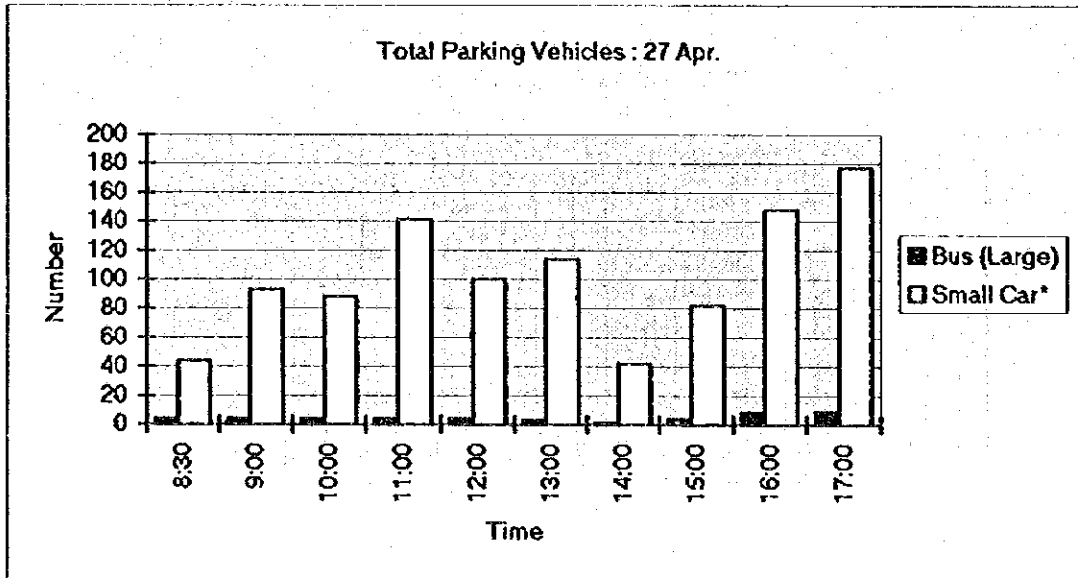
Total Parking Vehicles = [P-1 + P-2 + P-3]

	Private Car	Motorcycle	Minibus	Taxi	Bus (Large)	Truck (Cargo)	Others	Total (No.)	Small Car*
8:30	14	0	17	13	4	0	1	49	44
9:00	40	0	20	33	4	2	1	100	93
10:00	25	0	27	36	4	1	0	93	88
11:00	70	0	35	36	4	0	0	145	141
12:00	46	0	22	32	4	0	1	105	100
13:00	46	0	23	45	3	0	2	119	114
14:00	15	0	12	15	1	0	0	43	42
15:00	43	0	20	19	4	0	1	87	82
16:00	81	0	40	27	8	0	6	162	148
17:00	97	0	41	39	9	0	5	191	177

*: Private Car + Minibus + Taxi

Average: 102.9

Needs for large bus slots in %: 4.7%



Thru traffic-East bound A [Road-1(from West)]-[Entrance(From West)]

	Private Car	Motorcycle	Minibus	Taxi	Bus (Large)	Truck (Cargo)	Others	Total (No.)	(in PCU*)
8:30 ~ 9:00	5	53	0	0	0	3	3	64	37
9:00 ~ 10:00	18	55	0	0	0	3	1	77	45
10:00 ~ 11:00	4	56	0	0	1	2	4	67	39
11:00 ~ 12:00	0	50	0	0	0	3	0	53	23
12:00 ~ 13:00	35	31	2	15	0	6	0	89	75
13:00 ~ 14:00	17	22	3	0	0	1	1	44	32
14:00 ~ 15:00	12	25	4	0	0	4	0	45	33
15:00 ~ 16:00	0	0	12	0	0	1	2	15	19
16:00 ~ 17:00	19	18	7	0	1	4	0	49	43
8:30 ~ 17:00	110	310	28	15	2	27	11	503	347

Thru traffic-West bound A [Road-2(from East)]-[Entrance(From East)]

	Private Car	Motorcycle	Minibus	Taxi	Bus (Large)	Truck (Cargo)	Others	Total (No.)	(in PCU*)
8:30 ~ 9:00	0	28	0	0	0	0	0	28	9
9:00 ~ 10:00	4	48	0	0	0	1	2	55	27
10:00 ~ 11:00	0	38	0	0	0	3	6	47	34
11:00 ~ 12:00	14	100	0	0	4	0	4	122	67
12:00 ~ 13:00	18	50	5	0	2	6	4	85	68
13:00 ~ 14:00	20	87	9	4	0	0	4	124	72
14:00 ~ 15:00	4	101	0	2	4	5	2	118	65
15:00 ~ 16:00	0	87	0	1	1	1	2	92	39
16:00 ~ 17:00	20	100	7	4	0	3	0	134	71
8:30 ~ 17:00	80	639	21	11	11	19	24	805	452

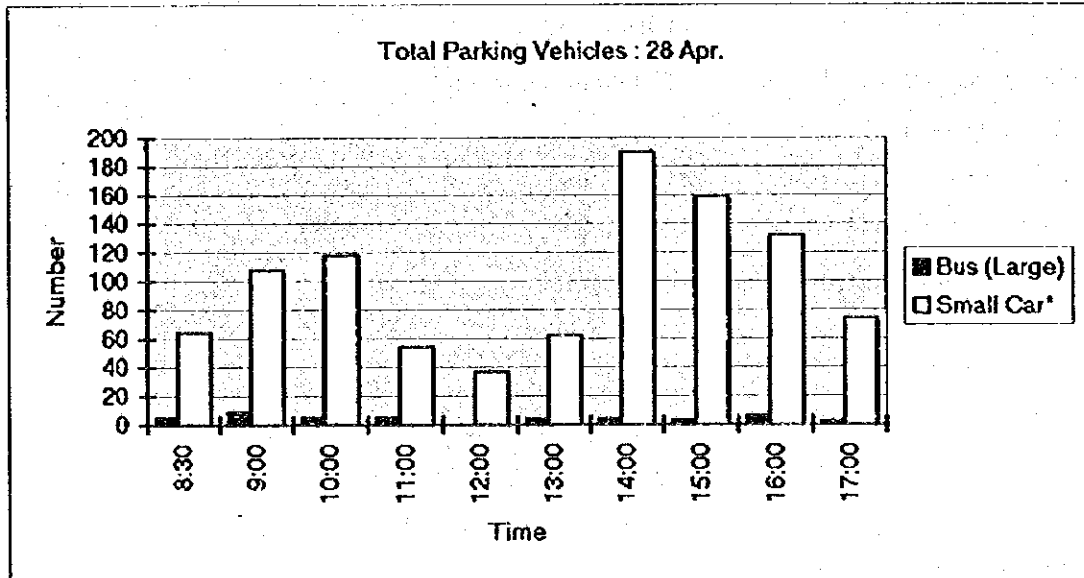
Total Parking Vehicles = [P-1 + P-2 + P-3]

	Private Car	Motorcycle	Minibus	Taxi	Bus (Large)	Truck (Cargo)	Others	Total (No.)	Small Car*
8:30	20	0	19	25	5	0	0	69	64
9:00	40	3	25	43	9	0	1	121	108
10:00	55	0	24	39	5	0	0	123	118
11:00	17	0	15	22	5	0	1	60	54
12:00	9	0	10	18	0	2	0	39	37
13:00	29	0	20	13	4	1	1	68	62
14:00	91	0	50	49	4	0	2	196	190
15:00	89	0	35	35	3	2	1	165	159
16:00	85	0	25	22	6	0	2	140	132
17:00	27	0	23	24	2	0	1	77	74
								Average:	99.8
								Needs for large bus slots in %:	4.3%

*: Private Car + Minibus + Taxi

Average: 99.8

Needs for large bus slots in %: 4.3%



Thru traffic-East bound A [Road-1(from West)]-[Entrance(From West)]

	Private Car	Motorcycle	Minibus	Taxi	Bus (Large)	Truck (Cargo)	Others	Total (No.)	(in PCU*)
8:30 ~ 9:00	0	36	1	0	0	1	0	38	15
9:00 ~ 10:00	0	49	0	0	1	4	1	55	30
10:00 ~ 11:00	0	51	0	0	0	7	0	58	32
11:00 ~ 12:00	2	21	0	1	2	5	1	32	28
12:00 ~ 13:00	14	30	2	2	2	2	1	53	40
13:00 ~ 14:00	34	45	5	4	0	12	0	100	84
14:00 ~ 15:00	21	30	2	12	3	0	0	68	52
15:00 ~ 16:00	29	40	0	6	2	10	3	90	83
16:00 ~ 17:00	0	23	0	4	0	9	1	37	34
8:30 ~ 17:00	100	325	10	29	10	50	7	531	399

Thru traffic-West bound A [Road-2(from East)]-[Entrance(From East)]

	Private Car	Motorcycle	Minibus	Taxi	Bus (Large)	Truck (Cargo)	Others	Total (No.)	(in PCU*)
8:30 ~ 9:00	0	19	0	0	0	0	0	19	6
9:00 ~ 10:00	0	30	0	2	0	8	3	43	37
10:00 ~ 11:00	0	50	0	0	7	3	6	66	56
11:00 ~ 12:00	17	67	0	9	2	7	2	104	74
12:00 ~ 13:00	11	44	0	1	1	3	2	62	41
13:00 ~ 14:00	0	121	6	0	3	7	0	137	69
14:00 ~ 15:00	10	136	6	1	1	4	4	162	83
15:00 ~ 16:00	22	118	0	0	1	9	5	155	96
16:00 ~ 17:00	18	15	4	8	3	2	6	56	62
8:30 ~ 17:00	78	600	16	21	18	43	28	804	523

Appendix 6.2.1

Calculation of Allowable Take-off Weight from the Existing Runway

1.	Runway Length:	3,200 m (10,500 ft)
2.	Elevation:	12 m (39 ft)
3.	Slope:	Negligible
4.	Wind:	Zero
5.	Reference Temperature:	32.9°C (91.2°F)
6.	Aircraft Type:	B747-200B JT9D-7A, 10° Flaps
7.	Maximum Takeoff Weight:	785,000 lbs (356,100 kg)
8.	Typical Operating Empty Weight plus Service Fuel:	414,000 lbs
9.	Maximum Payload:	160,700 lbs
10.	Average Fuel Consumption:	47 lbs/mile
11.	Reference Factor "R":	75.6
12.	Allowable Takeoff Weight:	738,300 lbs (334,900 kg)
13.	Weight Restriction:	46,700 lbs (21,200 kg) Equivalent to 29% of maximum pay load, or
14.	Maximum Length of Haul with Maximum Pay Load:	$(738,300 - 414,000 - 160,700) / 47 = 3,480$ miles (5,600 km) Equivalent to Hanoi to

Note: Calculation is based on "AC-150/5325-4A, Runway Length Requirements for Airport Design" by Federal Aviation Administration (FAA)

TRAFFIC SURVEY - PASSENGER INTERVIEW

As a part of work item 18, Traffic Survey for Hanoi International Airport New Development Plan was conducted on 26 through 28 April, 1995. It consists of 1) Passenger Interview; 2) Processing time; and 3) Vehicle Count. Passenger Interview is described here.

1. Survey Items Collection

Number of effective answers is as follows :

	<u>26 April</u>	<u>27 April</u>	<u>28 April</u>	<u>3 days</u>
Domestic departure passengers	174	531	393	1,098
International departure passengers	240	282	352	874
Total	414	813	745	1,972

Query Form (in English) is shown in page 2. (Vietnamese edition was also prepared)
List of flights that the survey targeted of is shown in page 3

Results of each survey items are given in the tables in pages 4 through 7.

2. Comments on Passenger Terminal Facilities

The most request from both domestic and international passengers is on air conditioning. The top ten comments are listed below.

1) By international passengers:

- 1 - Air-conditioning
- 2 - Cafeteria / Restaurant / Snack bar
- 3 - Seating at lounges
- 4 - Processing time of passport control
- 5 - Baggage handling
- 6 - Duty free shop
- 7 - Telephone
- 8 - Spaces of the facilities
- 9 - Sign / public announcement
- 10 - Language (use of French)

2) By domestic passengers:

- 1 - Air-conditioning
- 2 - Seating at lounges (especially, insufficient before check-in)
- 3 - Toilet facility
- 4 - Guidance (procedure, flight information / use of Vietnamese)
- 5 - Cafeteria / Restaurant / Snack bar
- 6 - No smoking area
- 7 - Taxi from / to Hanoi city
- 8 - Business class lounge
- 9 - Shops (smaller choice of newspapers / higher prices than in Hanoi)
- 10 - Spaces of the facilities

**CIVIL AVIATION ADMINISTRATION OF VIETNAM
PASSENGER SURVEY FOR HANOI INTERNATIONAL AIRPORT**

NO. _____	DATE: _____	TIME: _____ : _____	SURVEYOR NAME: _____
	FLIGHT NO. _____	PLACE: _____	Signature: _____
(International or Domestic)			

1. What is your Nationality? <input style="width:50px; height:30px;" type="text"/>	01. Viet Nam Indochina 11. Cambodia 12. Laos 13. Thailand 14. Myanmar 71. Middle East ()	East Asia 21. Hong kong 22. Singapore 23. Taiwan 24. Malaysia 25. China 26. Japan 27. Korea 28. Others () 81. Africa ()	South Asia 31. India 32. Others () Pacific 41. Australia 42. New Zealand 43. Others () 91. Others ()	The Americas 51. U.S.A. 52. Canada 53. Others () Europe 61. France 62. U.K. 63. Germany 64. Russia 65. Others ()
2. Are you starting your air trip from Hanoi Airport? <input style="width:50px; height:30px;" type="text"/>	Yes. (From Hanoi)	No. (Transit pax from:) 11. Foreign ()	Viet Nam 01. Ho Chi Minh 02. Hue 03. Da nang	04. Hna Trang 05. Dien Bien Phu 06. Others ()
3. Where is your today's destination Airport? <input style="width:50px; height:30px;" type="text"/>	Viet Nam 01. Ho Chi Minh 02. Hue 03. Da nang	04. Hna Trang 05. Dien Bien Phu 06. Others ()	11. Foreign ()	
4. What is your Occupation? <input style="width:50px; height:30px;" type="text"/>	01. Professional 02. Manufacturing 03. Service/Sales 04. Government	05. Agriculture 06. Education 07. Student 08. Housewife	09. Retired 10. Others ()	
5. What is the purpose of your travel? <input style="width:50px; height:30px;" type="text"/>	01. Holiday/Vacation 02. Business 03. Convention	04. Officials 05. Visiting friends/relatives 06. Others()		
6. By what Mode did you come to the airport? <input style="width:50px; height:30px;" type="text"/>	01. Private car 02. Rental/Hotel car 03. Company car	04. Taxi 05. Bus 06. Others()		
7. When did you arrive at the airport before departure?	_____ minutes before departure time			
8. How many persons do you travel with?	_____ persons (including you)			
9. How many well-wishers saw you off at the airport?	_____ persons			
10. How many baggages did you check in?	_____ pieces			
11. How much did you spend at terminal shops?	Don _____ or US _____			
12. Suggestions for airport facility if any:	_____			

April 26 Wed.

<International Departure>

Time	No.- Destination	Aircraft
7:20	VN741-SGN-SIN	A320
9:55	VN790-HKG	A320
10:00	VN924-TPE	A320
10:30	VN821-VTE	TU134
11:30	VN831-BKK	A320
13:20	TG683-BKK	A300
14:45	SQ175-SIN	A310
16:50	SU542-VIN	IL62
18:40	CX792-HKG	L1011
19:30	AF171-BKK-CDG	A340

<Domestic Departure>

Time	No.- Destination	Aircraft
6:30	VN249-HUI-SGN	ATR72
7:00	VN2111-SGN	A320
7:00	VN321-DAD-SGN	TU134
11:40	VN313-DAD	TU134
14:00	VN315-DAD	TU134
14:30	VN247-HUI-SGN	ATR72
16:00	VN225-SGN	B767
17:00	VN229-SGN	A320
18:00	VN231-SGN	A320
19:30	BL793-SGN	B737

April 27 Thu.

<International Departure>

Time	No.- Destination	Aircraft
9:30	QV322-VTE	YAK40
10:15	VN790-HKG	A320
10:30	VN821-VTE	TU134
11:30	VN831-BKK	A320

<Domestic Departure>

Time	No.- Destination	Aircraft
6:30	VN249-HUI	ATR72
7:00	VN311-DAD	TU134
7:20	VN741-SGN	A320
8:00	VN211-SGN	A320
11:40	VN313-DAD	TU134
12:00	VN217-SGN	A320
12:40	VN269-NHA	ATR72
13:00	VN219-SGN	A320
13:30	VN221-SGN	A320
14:00	VN315-DAD	TU134
16:45	VN227-SGN	A320
17:30	VN229-SGN	A320
18:30	BL791-SGN	B737
20:20	VN521-SGN	A320

April 28 Fri.

<International Departure>

Time	No.- Destination	Aircraft
9:55	VN790-HKG	A320
10:35	VN918-CAN	TU134
11:30	VN831-BKK	A320
16:50	SU542-SVO	IL62

<Domestic Departure>

Time	No.- Destination	Aircraft
6:30	VN249-HUI	ATR72
7:00	VN311-DAD	TU134
7:20	VN741-SGN	A320
10:00	VN2111-SGN	A320
10:30	VN217-SGN	A320
11:00	VN271-DIN	ATR72
11:40	VN313-DAD	TU134
14:00	VN315-DAD	TU134
14:30	VN247-HUI	ATR72
15:00	VN531-SGN	B767
15:30	VN919-SGN	TU134
16:00	VN225-SGN	A320
16:30	VN227-SGN	A320
17:00	VN229-SGN	A320
18:00	VN231-SGN	A320
19:50	BL791-SGN	B737

- LEGEND -

Answers were taken from passengers of these.

- CITY/AIRPORT CODE -

BKK	Bangkok	HKG	Hong Kong	SVO	Moscow-Sheremethyev
CAN	Guangzhou	HUI	Hue	TPE	Taipei
CDG	Paris-C. de Gaulle	NHA	Nha Trang	VTE	Vientiane
DAD	Da Nang	SGN	Ho Chi Minh	VIN	Vinnitsa
DIN	Dien Bien Phu	SIN	Singapore		

I. Preliminary Results of Interview Survey of Domestic Passengers

Q1. Nationality (%)

Vietnam	58.4	Taiwan	5.3	Other South Asia	0	France	6.7
Cambodia	0.1	Malaysia	1.1	Australia	3.3	U.K.	2.7
Laos	0	China	2.3	New Zealand	0.3	Germany	1.7
Thailand	0.6	Japan	4.1	Other Pacific	0	Russia	0.2
Myanmar	0	Korea	2.3	U.S.A.	3.3	Other Europe	2.3
Hong Kong	1.0	Other East Asia	0.2	Canada	1.9	Middle East	0.1
Singapore	1.6	India	0.2	Other America	0.2	Africa	0.1
Total (1,091 samples)							100.0

Q2. Origin of Trip (%)

Hanoi	95.8
Foreign Countries	0.6
Ho Chi Minh City	2.3
Hue	0
Danang	0.6
Nha Trang	0
Dien Bien Phu	0.1
Other Cities in Vietnam	0.6
Total (1,083 samples)	100.0

Q3. Destination of Trip (%)

Ho Chi Minh City	68.2
Hue	5.4
Danang	16.6
Nha Trang	2.6
Dien Bien Phu	0
Other City in Vietnam	4.9
Foreign Countries	2.3
Total (1,096 samples)	100.0

Q4. Occupation (%)

Professional	25.0
Manufacturing	21.6
Service/Sales	11.7
Government	3.8
Agriculture	2.9
Education	5.2
Student	5.6
Housewife	3.3
Retired	7.0
Others	13.9
Total (1,092 samples)	100.0

Q5. Purpose of Trip (%)

Holiday/Vacation	21.0
Business	30.7
Convention	6.8
Officials	21.9
Visiting Friend/Relatives	15.2
Others	4.4
Total (1,085 samples)	100.0

Q6. Access Mode (%)

Private Car	10.0
Rental/Hotel Car	13.1
Company Car	23.7
Taxi	20.9
Bus	29.7
Others	2.6
Total (1,083 samples)	100.0

Q7. Arrival Time before STD (%)

Less than 30 mins	3.9
From 30 to 59 mins	24.2
From 60 to 89 mins	43.8
From 90 to 119 mins	16.3
From 120 to 149 mins	9.9
From 150 to 179 mins	0.9
From 180 to 239 mins	0.5
More than 240 mins	0.5
Total (1,092 samples)	100.0
Average	70 mins

Q8. Number of Travellers in a Group (%)

0	2.4
1	36.1
2	35.9
3	11.1
4	5.4
5	2.5
6 - 10	2.8
More than 11	3.8
Total (1,093 samples)	100.0
Average	2.8

Q9. Number of Well Wishers (%)

0	63.8
1	15.4
2	13.0
3	2.9
4	1.8
5	1.7
6 - 10	1.2
More than 11	0.2
Total (1,011 samples)	100.0
Average	0.8

Q10. Number of Check-in Baggage (%)

0	25.5
1	41.3
2	20.2
3	6.2
4	3.7
5	1.0
6 - 10	1.0
More than 11	1.1
Total (1,049 samples)	100.0
Average	2.8

Q11. Expences at Terminal Shops

Average Expences	US\$ 10.1
-------------------------	------------------

2. Preliminary Results of Interview Survey of International Passengers

Q1. Nationality (%)

Vietnam	30.6	Taiwan	1.1	Other South Asia	0.1	France	13.5
Cambodia	0.4	Malaysia	1.6	Australia	4.0	U.K.	5.0
Laos	0.5	China	1.6	New Zealand	0.9	Germany	5.1
Thailand	2.0	Japan	3.2	Other Pacific	0.1	Russia	5.4
Myanmar	0	Korea	2.6	U.S.A.	5.9	Other Europe	6.1
Hong Kong	2.6	Other East Asia	0	Canada	2.7	Middle East	0.3
Singapore	3.2	India	1.2	Other America	0.3	Africa	0
Total (741 samples)							100.0

Q2. Origin of Trip (%)

Hanoi	92.6
Foreign Countries	0.1
Ho Chi Minh City	4.7
Hue	0.5
Danang	0.1
Nha Trang	0
Dien Bien Phu	0.1
Others	1.9
Total (735 samples)	100.0

Q3. Destination of Trip (%)

Ho Chi Minh City	0.1
Hue	0
Danang	0
Nha Trang	0
Dien Bien Phu	0
Other City in Vietnam	0
Foreign Countries	99.9
Total (740 samples)	100.0

Q4. Occupation (%)

Professional	32.8
Manufacturing	16.3
Service/Sales	19.3
Government	4.7
Agriculture	0.9
Education	4.9
Student	7.7
Housewife	4.1
Retired	2.4
Others	6.9
Total (737 samples)	100.0

Q5. Purpose of Trip (%)

Holiday/Vacation	34.2
Business	31.1
Convention	7.2
Officials	8.8
Visiting Friend/Relatives	17.1
Others	1.6
Total (737 samples)	100.0

Q6. Access Mode (%)

Private Car	12.7
Rental/Hotel Car	20.5
Company Car	26.3
Taxi	19.2
Bus	20.1
Others	1.2
Total (733 samples)	100.0

Q7. Arrival Time before STD (%)

Less than 30 mins	10.0
From 30 to 59 mins	27.4
From 60 to 89 mins	33.2
From 90 to 119 mins	9.3
From 120 to 149 mins	6.6
From 150 to 179 mins	2.5
From 180 to 239 mins	4.2
More than 240 mins	6.8
Total (731 samples)	100.0
Average	105 mins

Q8. Number of Travellers in a Group (%)

0	10.0
1	27.4
2	33.2
3	9.3
4	6.6
5	2.5
6 - 10	4.2
More than 11	6.8
Total (731 samples)	100.0
Average	3.3

Q9. Number of Well Wishers (%)

0	41.9
1	19.1
2	16.6
3	6.8
4	5.1
5	5.6
6 - 10	4.2
More than 11	0.7
Total (711 samples)	100.0
Average	1.7

Q10. Number of Check-in Baggage (%)

0	5.6
1	51.6
2	26.4
3	7.7
4	4.4
5	1.4
6 - 10	2.6
More than 11	0.3
Total (727 samples)	100.0
Average	3.2

Q11. Expences at Terminal Shops

Average Expences	US\$ 17.3
------------------	-----------

Appendix 6.3.2

TRAFFIC SURVEY - PROCESSING TIME

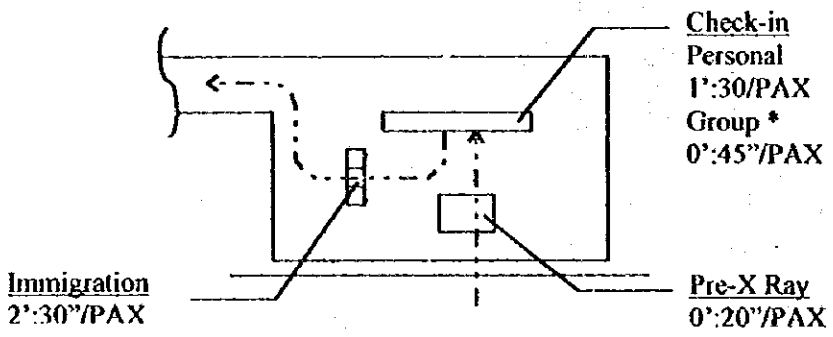
1. Survey Items

The following items were measured. For result of the measurement, see pages 2 through 4.

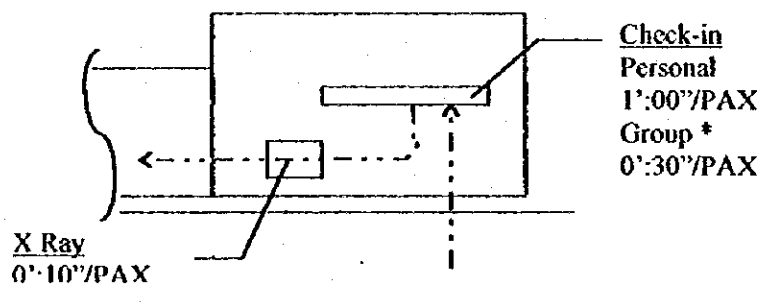
- 1) International Departure
Pre-X Ray → Check-in → Immigration
- 2) Domestic Departure
Check-in → X Ray
- 3) International Arrival
Immigration → X ray → Custom Check

2. Proposed Processing Time for Design and Evaluation

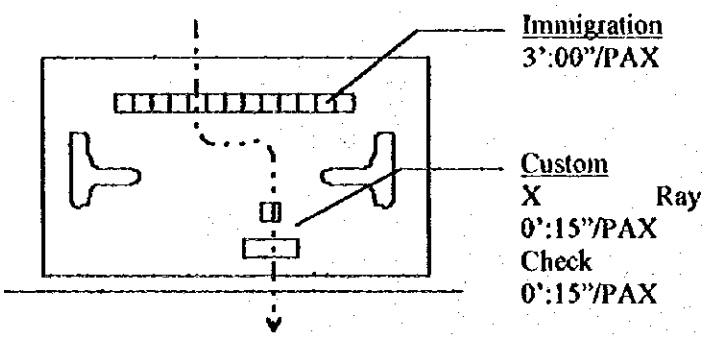
1) International Departure



2) Domestic Departure



3) International Arrival



International Departure

Check-in

<u>Date</u>	<u>Time</u>	<u>Sample</u>	<u>Class</u>	<u>Process Time</u>
[Personal passenger - Business class]				
		1	Business	3:18
		1	-ditto-	2:00
		1	-ditto-	2:28
		1	-ditto-	3:44
		1	-ditto-	1:00
		5		12:30
		Average		2:30

[Personal passenger - Economy class]

27-Apr	9:50~	2	Economy	4:07
		3	-ditto-	2:43
		1	-ditto-	3:20
		2	-ditto-	1:21
		8		11:31
		Average		1:26

[Group passenger]

27-Apr	9:50~	17	Economy	8:00
		Average		0:28 sec.

Immigration

<u>Date</u>	<u>Sample</u>	<u>Process Time</u>
27-Apr	24	10:37
	Average	2:26

International Arrival

Immigration

<u>Date</u>	<u>Time</u>	<u>Sample</u>	<u>Process Time</u>
27-Apr		7	22:54
		Average	3:16
28-Apr	15:21~	7	21:25
		12	38:30
		7	21:16
		20	50:10
		46	11:21
		Average	2:51

Processing time varies 2 to 4 minutes depend on individual officers.

Domestic Departure

Check-In

<u>Date</u>	<u>Time</u>	<u>Sample</u>	<u>Class</u>	<u>Process Time</u>
[Business class]				
26-Apr	12:07~	1	Business	0:47
		1	-ditto-	1:09
		1	-ditto-	0:50
		3		2:46
		Average		0:55 sec.
[Economy class]				
28-Apr	12:30~	1	Economy	} 11:03
		:	:	
		1	-ditto-	
		18		11:03
		Average (solo)		0:36 sec.
28-Apr	12:30~	2	Economy	} 9:26
		:	:	
		2	-ditto-	
		12		9:26
		Average (duet)		0:47 sec.
28-Apr	12:30~	3	Economy	} 5:01
		4	-ditto-	
		7		
		Average (3~4 group)		5:01
				0:43 sec.

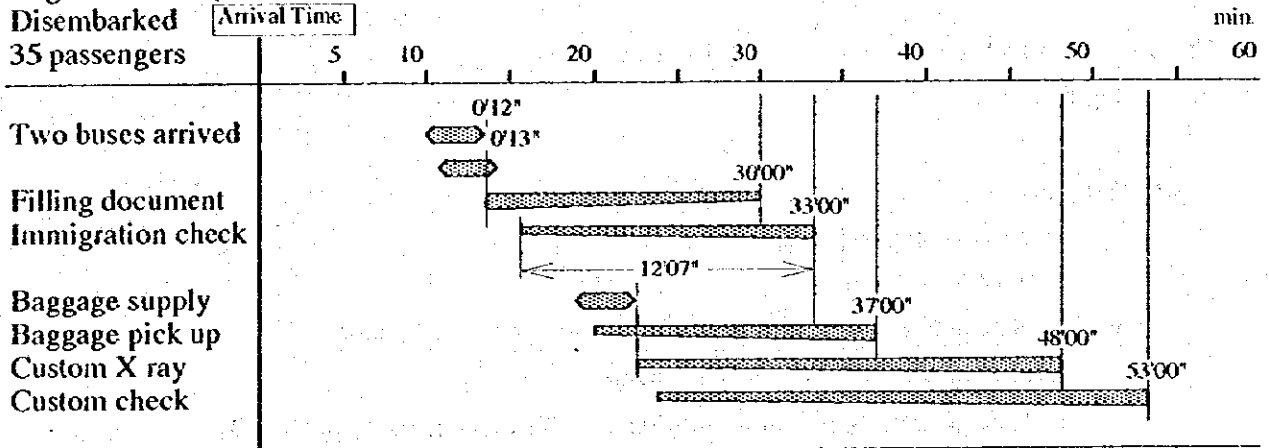
X-Ray

<u>Date</u>	<u>Time</u>	<u>Sample</u>	<u>Class</u>	<u>Process Time</u>
26-Apr	12:22~	12	-	113 sec.
	16:11~	17	-	175 sec.
		29		288 sec.
		Average		9.9 sec.

International Arrival Flow

Observation notes

Flight : VN820 (Arrival time 13:00) from Vientiane



Arrival flight from Vientiane (Tu-134 aircraft :seat capacity = 72)

35 passengers were disembarked (load factor was 49%), carried by two ramp buses to the terminal. Passengers, they did not seem to be given any document form on board, started to fill the document first of all. Most of the passengers on the next arrival flight by Thai International had the document filled on board contrary. (Some did not though.) 13 officers, out of 15 immigration booths, processed the passengers. There are few queue generated. Some officers processed only three or four passengers. The longest time was 5 minutes 30 second.

Appendix 6.3.3

Calculation of Existing Capacity of Major Passenger Processing Facilities

The following IATA formulae are used for calculating handling capacity of existing passenger processing facilities.

1. Check-In Desks:

$$N = [(a+b)t/60] \times 1.1$$

$$a = 60N/t/1.1 - b$$

where N: Number of check-in desk ; existing=Int'l 13 , Dom. 7

a: Number of peak hour passengers

b: Number of peak hour landside transfer passengers, estimated=0

t: Average processing time per passenger at check-in desks

; estimated=Int'l 1.5 , Dom. 1.0 mins.

Therefore,

$$\text{Int'l } a = 60 \times 13 / 1.5 / 1.1 - 0 = 473$$

$$\text{Dom. } a = 60 \times 7 / 1.0 / 1.1 - 0 = 382$$

2. Departure Passport Control:

$$N = [(a+b)t/60] \times 1.1$$

$$a = 60N/t/1.1 - b = 240$$

where N: Number of departure passport control ; existing=11

a: Number of peak hour passengers

b: Number of peak hour landside transfer passengers, estimated=0

t: Average processing time per passenger at departure passport control

; estimated=2.5 mins.

Therefore,

$$a = 60 \times 11 / 2.5 / 1.1 - 0 = 240$$

3. Departure Lounge:

$$A = [c(ui+vk)/30] \times 1.1$$

$$c = 30A/(ui+vk)/1.1$$

where A: Area of departure lounge ; existing=Int'l 597 , Dom. 829 sq.m

c: Number of peak hour departing passengers

i: Proportion of long haul departing passengers during peak hour

; estimated=Int'l 100% , Dom. 0%

k: Proportion of short haul departing passengers during peak hour

; estimated=Int'l 0% , Dom. 100%

u: Average occupancy time of departure lounge per departing long-haul passengers ;estimated=Int'l 50 , Dom. 50 mins.

v: Average occupancy time of departure lounge per departing short-haul passengers ;estimated=Int'l 30 , Dom. 30 mins.

Therefore,

$$\text{Int'l } c = 30 \times 597 / (50 \times 1.0 + 30 \times 0) / 1.1 = 326$$

$$\text{Dom. } c = 30 \times 829 / (50 \times 0 + 30 \times 1.0) / 1.1 = 754$$

4. Arrival Passport Control:

$$N = [(d+b)t_3/60] \times 1.1$$

$$d = 60N/t_3/1.1 - b = 273$$

where N: Number of arrival passport control ;existing=15

b: Number of peak hour landside transfer passengers, estimated=0

d: Number of peak hour terminating passengers

t₃: Average processing time per passenger at arrival passport control ;estimated=3.0 mins.

Therefore,

$$d = 60 \times 15 / 3.0 / 1.1 - 0 = 273$$

5. Arrival Customs:

$$N = e f t_4 / 60$$

$$e = 60N / f t_4$$

where N: Number of arrival customs ;existing=26

e: Number of peak hour terminating and Int'l/Dom. passengers ,estimated=d

f: Proportion of passengers to be customs checked ;estimated=100%

t₄: Average processing time per passenger at arrival customs ;estimated=0.5 mins.

Therefore,

$$e = 60 \times 26 / 1.0 / 0.5 = 3120$$

EXAMPLE SKETCHES OF RAIL ACCESS

1. Existing Rail Network in Hanoi

There exists a rail network of Vietnam Railway (VNR) around Hanoi area as shown in 6.4.1.1. All lines are single track and are not electrified. Rolling stock consists of diesel/steam locomotives and trailers, but no diesel railcars. There are numbers of level crossing in down town. Long Bien Bridge on Red River, between Hanoi central station (Ga Hanoi) and Gia Lam, is so worn that the speed and load on the bridge are restricted to 15km/h and 12ton/axle, respectively. Tracks are in meter gauge (MiG) or mixed gauge (MxG) of standard gauge (StG) and meter gauge. Unification into meter gauge is being considered for the whole nation. Signaling system is out of date. Existing facilities and rolling stock do not have potential as airport access system at present.

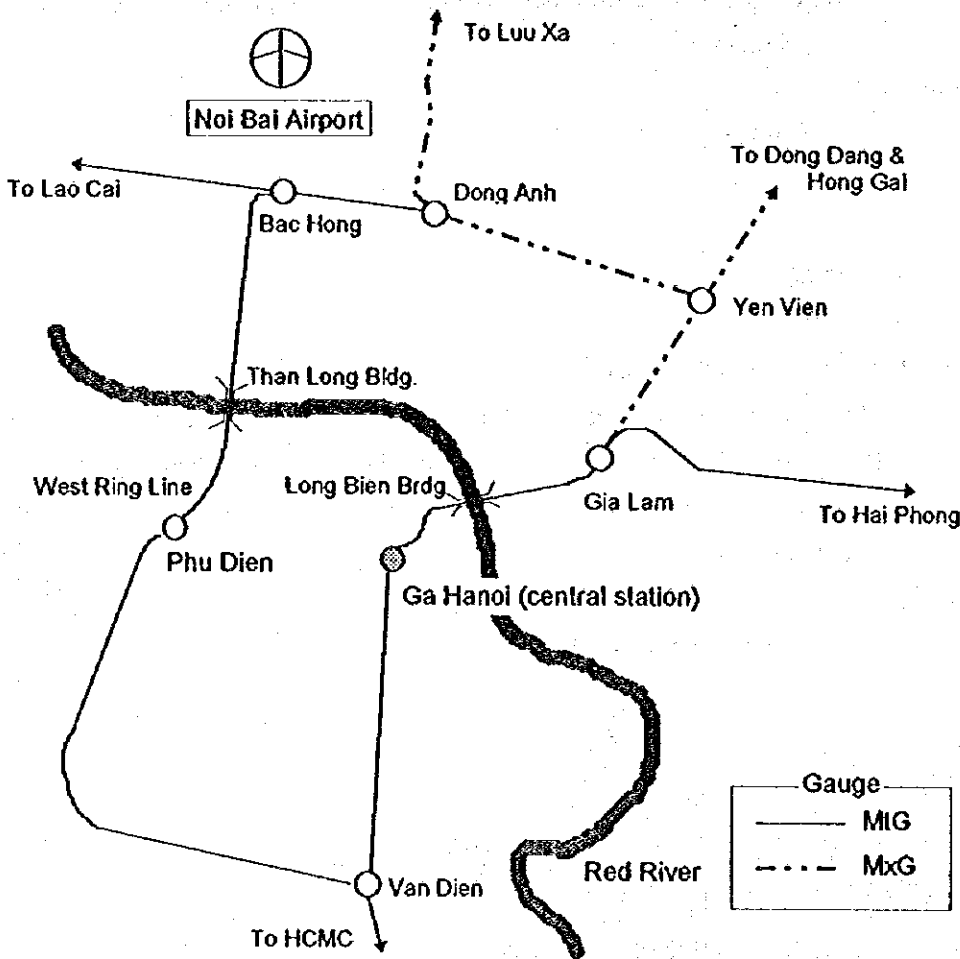


Figure 6.4.1.1 Existing VNR Network around Hanoi

2. Possibility of Airport Rail Access

1) By Utilizing the Existing VNR Lines

Railway has advantages in the following roles among the other mode of transportation.

- Inter city passenger transportation, such as Hanoi - Hai Phong
- Urban transportation in Hanoi for city commuters
- Freight transportation of bulk cargo

Upgrading and rehabilitation of the existing VNR network and rolling stocks must be done to accomplish the roles. Airport access can be planned on this strengthened facilities.

It will need a new line from a branch point on the existing railway. The nearest branch point to Noi Bai Airport is on Don Anh - Luu Xa line, 5-6 km north from Don Anh station. Branch from Bac Hong station will be another alternative.

- **Noi Bai Express - A**¹

Route : Noi Bai Airport - Dong Anh - Yen Vien - Gia Lam - Ga Hanoi

This route connects the existing down town to the airport. Long Vien bridge should be replaced, but this is not only for airport access. Hanoi - Hai Phong route (MtG) passes on this bridge. Since this corridor will have huge transportation demand, "Hai Phong express" has been suggested in "The Master Plan Study on the Transport Development in the Northern Part in the Socialist Republic of Vietnam", JICA, 1994. Noi Bai Express train can be commonly operated with Hai Phong express's diesel rail car to maximize the productivity.

- **Noi Bai Express - B**

Route : Noi Bai Airport - Bac Hong - Tang Long - Phu Dien "Hanoi West"

This route utilizes "Hanoi West Ring Line" which is almost abandoned except for some occasional operations. On the other hand, Thang Long Bridge on Red River has double deck of road and double-tracked railway. Since density area of Hanoi sprawls to the west, the city side terminal can be planned near the existing Phu Dien station.

¹ A request has been made for grade separation at Hanoi station, which influences planning for the track section approaching Long Bien bridge. On the other hand, local authorities have called for closure of Long Bien bridge and Hanoi central station for reasons of other urban planning considerations. This description assumes continuous use of Hanoi station as a central station.

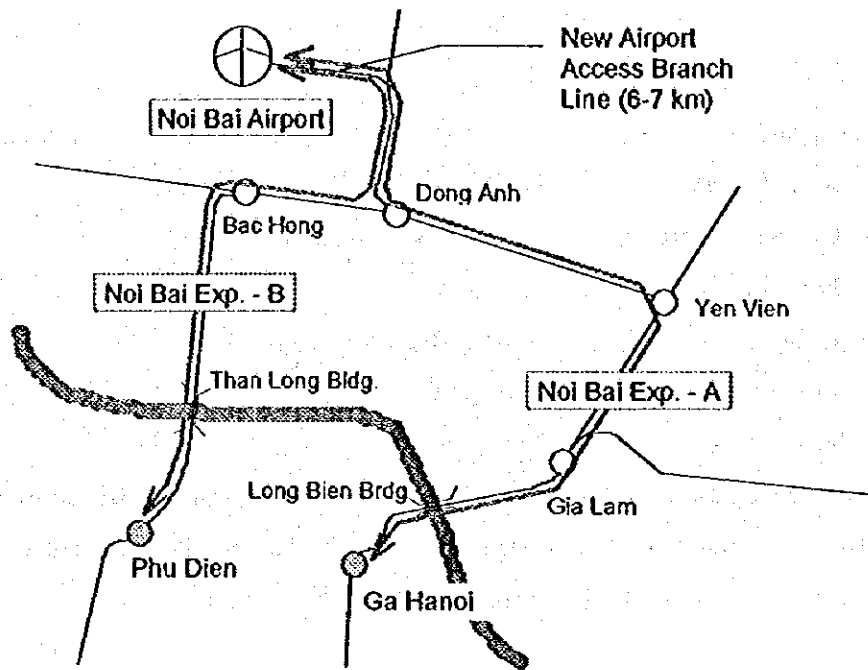


Figure 6.4.1.2 Route of Noi Bai Express by VNR

2) By Utilizing Future Hanoi City Urban Rail Transportation System²

The needs for mass transportation system in Hanoi already exist. All new mass rapid transportation system will be focused sooner or later. Airport access train can be planned as a part of the network.

²Timely, JICA is going to implement a study on urban transportation system in Hanoi in response to the request of the Government of Viet Nam from the latter of 1995.

Light Rail Transit (LRT)

In case LRT system will be developed for urban transportation, through operation of LRT train to the airport can be an alternative. This is an idea of combination use of new LRT in the city, and the existing VNR lines in suburb.

“LRT” means light standard electric railway system, which has been closed-up since 1970’s as economic and environmental friendly medium capacity transportation mean. Many of European and American cities have modern LRT system whose origin was tramway. Some Asian cities has newly developed LRT, for example Manila’s Metrorail. Since LRT is less expensive mode of rail transportation system, it is easier to introduce it to this country than full-sized new railway.

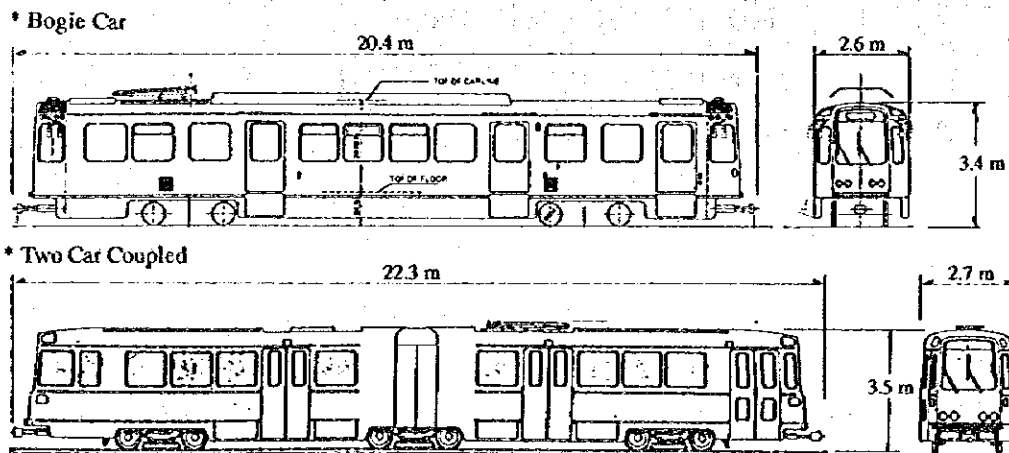


Figure 6.4.1.3 Example of LRT Train

Though LRT train is normally one to three cars train by 15 to 20 meter long, light weight electric railcars, latest technology enables its high speed operation especially in suburban section.

Table 6.4.1.1 Example of through operation of LRT into Ordinary Railway (recent cases)

City - Country	Description	Remarks
Buffalo - USA	Renovation of the existing tramway. Transit mall in down town section and underground in suburban section.	LRT train has step for low level platform in the transit mall section.
Karlsruhe - Germany	Expansion of existing LRT to connect to existing local line of National Railway.	New LRT stations were constructed in the National Railway section.

Appendix 7.6.1

Appendix 7.6.1 Air Passenger Traffic used for the Financial Evaluation of the T1 Project

Year	Passengers		
	Intl	Dom.	Total
1995	472,000	950,000	1,422,000
1996	587,000	1,202,000	1,789,000
1997	713,000	1,455,000	2,168,000
1998	849,000	1,698,000	2,547,000
1999	992,000	1,923,000	2,915,000
2000	1,141,000	2,126,000	3,267,000
2001	1,282,000	2,337,000	3,619,000
2002	1,441,000	2,569,000	4,010,000
2003	1,620,000	2,823,000	4,443,000
2004	1,821,000	3,103,000	4,924,000
2005	2,047,000	3,411,000	5,458,000
2006	2,047,000	3,411,000	5,458,000
2007	2,047,000	3,411,000	5,458,000
2008	2,047,000	3,411,000	5,458,000
2009	2,047,000	3,411,000	5,458,000
2010	2,047,000	3,411,000	5,458,000
2011	2,047,000	3,411,000	5,458,000
2012	2,047,000	3,411,000	5,458,000
2013	2,047,000	3,411,000	5,458,000
2014	2,047,000	3,411,000	5,458,000
2015	2,047,000	3,411,000	5,458,000

Appendix 7.6.2 Annual Requirements of Capital Investment Cost of the T1 Project

Unit: US\$ '000

Year	Civil Works (1)	Building Works (2)	Special Equipment (3)	Consulting Services (4)	Contingencies (5)	Total (6)=(1)+...+(5)
1995						
1996						
1997				4,556	456	5,012
1998	1,100	9,790		2,278	1,317	14,485
1999	5,500	48,950	1,500	3,417	5,937	65,304
2000	4,400	39,160	3,500	1,139	4,820	53,019
2001						
2002						
2003						
2004						
2005						
2006						
2007						
2008						
2009						
2010						
2011						
2012						
2013						
2014						
2015	-5,500	-48,950				-54,450
Total						
T1 Project	11,000	97,900	5,000	11,390	12,529	137,819

Note 1: Total cost of each work is distributed by the following percentage distribution rates based on the anticipated implementation schedule of the Project.

Year	Civil	Building	Special Eq.	Consul.
1996				
1997				40%
1998	10%	10%		20%
1999	50%	50%	30%	30%
2000	40%	40%	70%	10%

Note 2: Contingencies (10% of each work) are assumed to be used at each time of construction/installation/consulting work.

Note 3: Residual values are considered for civil facilities and buildings with 30 year depreciation period.

Appendix 7.6.3

Appendix 7.6.3 Maintenance Cost of the T1 Project

Unit: US\$ '000

Year	Civil Works (1)	Building Works (2)	Special Equipment (3)	Total (4)=(1)+...+(3)
1995				
1996				
1997				
1998				
1999				
2000				
2001	110	979	250	1,339
2002	110	979	250	1,339
2003	110	979	250	1,339
2004	110	979	250	1,339
2005	110	979	250	1,339
2006	110	979	250	1,339
2007	110	979	250	1,339
2008	110	979	250	1,339
2009	110	979	250	1,339
2010	110	979	250	1,339
2011	110	979	250	1,339
2012	110	979	250	1,339
2013	110	979	250	1,339
2014	110	979	250	1,339
2015	110	979	250	1,339

Note: Maintenance cost is estimated by the following percentage rates on the construction cost of each airport facility.

Civil Works	1%
Building Works	1%
Special Equipment	5%

Appendix 7.6.4 Personnel Cost, Overhead and Other Labor Costs of the T1 Project.

Year	Unit Staff Cost (US\$/Year)	Passengers	Cargo (ton)	Traffic Units	Traffic Unit Growth	Productivity Improvement	Staff Growth Rate	Number of Staff	Personnel Cost (000 US\$)	Overhead Cost (000 US\$)	Other Cost (000 US\$)	Total Cost (000 US\$)
	(1)											
1995	1,500	1,422,000	22,200	1,644				350	525	268	142	
1996	1,610	1,789,000	29,600	2,085	26.8%	7.5%	19.3%	420	676	345	183	
1997	1,730	2,168,000	38,000	2,548	22.2%	7.5%	14.7%	480	830	424	224	
1998	1,860	2,547,000	46,300	3,010	18.1%	7.5%	10.6%	530	986	503	266	
1999	2,000	2,915,000	54,500	3,460	15.0%	7.5%	7.5%	570	1,140	581	308	
2000	2,150	3,267,000	62,600	3,893	12.5%	7.5%	5.0%	600	1,290	658	348	
2001	2,300	3,619,000	71,000	4,329	11.2%	7.2%	4.0%	620	1,426	727	385	2,538
2002	2,470	4,010,000	80,400	4,814	11.2%	7.2%	4.0%	640	1,581	806	427	2,814
2003	2,650	4,443,000	91,200	5,355	11.2%	7.2%	4.0%	670	1,776	906	479	3,160
2004	2,840	4,924,000	103,100	5,955	11.2%	7.2%	4.0%	700	1,988	1,014	537	3,539
2005	3,040	5,458,000	116,700	6,625	11.3%	7.2%	4.1%	730	2,219	1,132	599	3,950
2006	3,230	5,958,000	116,700	6,625	0.0%	6.4%	0.0%	730	2,358	1,203	637	4,197
2007	3,440	6,458,000	116,700	6,625	0.0%	6.4%	0.0%	730	2,511	1,281	678	4,470
2008	3,660	6,958,000	116,700	6,625	0.0%	6.4%	0.0%	730	2,672	1,363	721	4,756
2009	3,890	7,458,000	116,700	6,625	0.0%	6.4%	0.0%	730	2,840	1,448	767	5,055
2010	4,140	7,958,000	116,700	6,625	0.0%	6.4%	0.0%	730	3,022	1,541	816	5,380
2011	4,350	8,458,000	116,700	6,625	0.0%	5.0%	0.0%	730	3,176	1,620	857	5,652
2012	4,570	8,958,000	116,700	6,625	0.0%	5.0%	0.0%	730	3,336	1,701	901	5,938
2013	4,800	9,458,000	116,700	6,625	0.0%	5.0%	0.0%	730	3,504	1,787	946	6,237
2014	5,040	9,958,000	116,700	6,625	0.0%	5.0%	0.0%	730	3,679	1,876	993	6,549
2015	5,290	10,458,000	116,700	6,625	0.0%	5.0%	0.0%	730	3,862	1,969	1,043	6,874

Note 1: The number of staff in 1995 includes those who mainly work for terminal operations within 5 line departments of the NAR.

Note 2: Personnel cost includes basic salaries, bonuses, pension and insurance.

The average cost is estimated to increase at the same rate GDP per capita growth rate as follows:

1995-2000	7.5% per annum	2005-2010	6.4% per annum
2000-2005	7.2% per annum	2010-2015	5.0% per annum

Note 3: Traffic unit is defined as 1/1000 of annual number of passengers plus 1/100 of annual tonnage of cargo.

Note 4: The number of staff is assumed to increase in proportion with the growth of traffic units less productivity improvement of the staff, which is equal to the increase in their real income.

Note 5: Overhead cost includes professional management expenditure, travel cost, stationary supply, telephone charge, uniform, land tax and training cost.

It is estimated as 51% of personnel cost based on the financial statement of the NAR in 1994.

Note 6: Other labor cost includes payments to workers for cleaning and gardening of terminal area, etc. It is estimated as 27% of personnel cost based on the financial statement of the NAR in 1994.

Appendix 7.6.5

Appendix 7.6.5 Utility Cost of the T1 Project

Year	Electricity Consump. (MWh)	Electricity Cost ('000 US\$)	Fuel Cost ('000 US\$)	Total Cost ('000 US\$)
	(1)	(2)	(3)	(4)=(2)+(3)
1995				
1996				
1997				
1998				
1999				
2000				
2001	15,125	756	38	794
2002	15,125	756	38	794
2003	15,125	756	38	794
2004	15,125	756	38	794
2005	15,125	756	38	794
2006	15,125	756	38	794
2007	15,125	756	38	794
2008	15,125	756	38	794
2009	15,125	756	38	794
2010	15,125	756	38	794
2011	15,125	756	38	794
2012	15,125	756	38	794
2013	15,125	756	38	794
2014	15,125	756	38	794
2015	15,125	756	38	794

- Note 1: Annual consumption of electricity is from the Feasibility Study of the T1 Project.
 Note 2: The rate of electricity is US\$0.05 per KWH
 Note 3: Fuel cost is 5% of electricity expenses.

Appendix 7.6.6 Passenger Service Charge, Terminal Equipment Charge, Concession Fee and Car Parking Charge of the T1 Project
Unit: '000 US\$

Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)	Total (8)=(1)+...+(7)
	Intl Pax Service Charge	Dom. Pax Service Charge	Intl Bldg. Equipment Charge	Dom. Bldg. Equipment Charge	Intl Bldg. Concession Fee	Dom. Bldg. Concession Fee	Car Parking Charge	
1995								
1996								
1997								
1998								
1999								
2000								
2001	7,307	3,027	1,028	467	2,564	467	1,316	16,175
2002	8,214	3,328	1,153	514	2,982	514	1,458	18,062
2003	9,234	3,657	1,296	565	3,240	565	1,616	20,172
2004	10,380	4,020	1,457	621	3,642	621	1,791	22,530
2005	11,668	4,419	1,638	682	4,094	682	1,985	25,167
2006	11,668	4,419	1,638	682	4,094	682	1,985	25,167
2007	11,668	4,419	1,638	682	4,094	682	1,985	25,167
2008	11,668	4,419	1,638	682	4,094	682	1,985	25,167
2009	11,668	4,419	1,638	682	4,094	682	1,985	25,167
2010	11,668	4,419	1,638	682	4,094	682	1,985	25,167
2011	11,668	4,419	1,638	682	4,094	682	1,985	25,167
2012	11,668	4,419	1,638	682	4,094	682	1,985	25,167
2013	11,668	4,419	1,638	682	4,094	682	1,985	25,167
2014	11,668	4,419	1,638	682	4,094	682	1,985	25,167
2015	11,668	4,419	1,638	682	4,094	682	1,985	25,167

Note 1: Passenger service charges are calculated with US\$12 per departing international passenger and US\$2.7 per departing domestic passengers. The current rates are US\$7 and US\$1.4 respectively.

Note 2: The collection rate of 95% is used for calculation.

Note 3: Terminal equipment charges will be collected from airline companies for the use of passenger boarding bridges, check-in tables, baggage conveyors and baggage claim equipment. The charges are assumed to be US\$0.8 per international passengers and US\$0.2 per domestic passenger.

Note 4: Concession fee will be collected from business entities for commercial rights at the airport. US\$2.0 per international passengers and US\$0.1 per domestic passengers are reasonable estimates for the terminal buildings of comparative size.

Note 5: Charge per one time of car parking is assumed to be US\$0.9, twice the present rate. Based on the traffic survey conducted by the JICA Study Team in May 1995, the parking rate of 0.4 car/passenger is used to estimate the number of cars to be parked.

Appendix 7.6.7

Appendix 7.6.7 Passenger Terminal Rent and Advertisement Revenues of the T1 Project

Unit: '000 US\$

Year	Int'l Pax Terminal Rent (1)	Dom. Pax Terminal Rent (2)	Int'l Bldg. Advertise. Revenue (3)	Dom. Bldg. Advertise. Revenue (4)	Total (5)=(1)+..+(4)
1995					
1996					
1997					
1998					
1999					
2000					
2001	1,350	300	150	50	1,850
2002	1,350	300	150	50	1,850
2003	1,350	300	150	50	1,850
2004	1,350	300	150	50	1,850
2005	1,350	300	150	50	1,850
2006	1,350	300	150	50	1,850
2007	1,350	300	150	50	1,850
2008	1,350	300	150	50	1,850
2009	1,350	300	150	50	1,850
2010	1,350	300	150	50	1,850
2011	1,350	300	150	50	1,850
2012	1,350	300	150	50	1,850
2013	1,350	300	150	50	1,850
2014	1,350	300	150	50	1,850
2015	1,350	300	150	50	1,850

Note 1: Terminal rent is calculated based on the following conditions.

	Percentage Rentable Area	Rent/sq m/month
Int'l Passenger Terminal	15%	US\$25.0
Dom. Passenger Terminal	10%	US\$12.5

Note 2: Advertise revenue is estimated for US\$5 per sq.m per year for international passenger terminal building, and US\$2.5 per sq.m per year for domestic passenger terminal building.

Appendix 7.6.8a Comparison of Costs and Revenues - T1 Project (Case A: Int'l PSC = US\$9, Dom. PSC = VND20,000)

Unit: US\$ '000

Year	Costs					Revenues										Operating Profits		
	Const- ruction Cost (1)	Mainte- nance Cost (2)	Personnel, Overhead & Other (3)	Utilities Cost (4)	Total Cost (5)=(1)+(2)+(3)+(4)	Int'l Pax Service Charge (6)	Dom. Pax Service Charge (7)	Int'l Bldg. Equipment Charge (8)	Dom. Bldg. Equipment Charge (9)	Int'l Bldg. Concession Fee (10)	Dom. Bldg. Concession Fee (11)	Car Parking Charge (12)	Int'l Pax Terminal Rent (13)	Dom. Pax Terminal Rent (14)	Adver- tise- ment Revenue (15)		Total Revenue (16)=(6)+(7)+(13)+(14)+(15)	Operating Profits (17)=(16)-(5)
1995																		
1996																		
1997	5,012				5,012													-5,012
1998	14,485				14,485													-14,485
1999	65,304				65,304													-65,304
2000	53,019				53,019													-53,019
2001		1,339	2,538	794	4,671	5,481	2,018	1,026	467	2,564	467	1,316	1,350	300	200	15,188	10,518	
2002		1,339	2,814	794	4,947	6,160	2,219	1,153	514	2,882	514	1,458	1,350	300	200	16,750	11,803	
2003		1,339	3,160	794	5,293	6,926	2,438	1,296	565	3,240	565	1,616	1,350	300	200	18,494	13,201	
2004		1,339	3,538	794	5,672	7,785	2,680	1,457	621	3,642	621	1,791	1,350	300	200	20,445	14,773	
2005		1,339	3,950	794	6,083	8,751	2,946	1,638	682	4,094	682	1,985	1,350	300	200	22,628	16,544	
2006		1,339	4,197	794	6,330	8,751	2,946	1,638	682	4,094	682	1,985	1,350	300	200	22,628	16,297	
2007		1,339	4,470	794	6,903	8,751	2,946	1,638	682	4,094	682	1,985	1,350	300	200	22,628	16,025	
2008		1,339	4,756	794	6,889	8,751	2,946	1,638	682	4,094	682	1,985	1,350	300	200	22,628	15,739	
2009		1,339	5,055	794	7,188	8,751	2,946	1,638	682	4,094	682	1,985	1,350	300	200	22,628	15,440	
2010		1,339	5,390	794	7,513	8,751	2,946	1,638	682	4,094	682	1,985	1,350	300	200	22,628	15,115	
2011		1,339	5,652	794	7,785	8,751	2,946	1,638	682	4,094	682	1,985	1,350	300	200	22,628	14,842	
2012		1,339	5,938	794	8,071	8,751	2,946	1,638	682	4,094	682	1,985	1,350	300	200	22,628	14,556	
2013		1,339	6,237	794	8,370	8,751	2,946	1,638	682	4,094	682	1,985	1,350	300	200	22,628	14,270	
2014		1,339	6,549	794	8,682	8,751	2,946	1,638	682	4,094	682	1,985	1,350	300	200	22,628	13,945	
2015	-54,450	1,339	6,874	794	-45,443	8,751	2,946	1,638	682	4,094	682	1,985	1,350	300	200	22,628	68,071	

FIRR
NPV (at 8% discount rate)

7.3%
-4,951

Appendix 7.6.8b Comparison of Costs and Revenues - T1 Project (Case B: Int'l PSC = US\$12, Dom. PSC = VND30,000)

Year	Costs					Revenues										Operating Profits		
	Construction Cost (1)	Maintenance Cost (2)	Personnel, Overhead & Other (3)	Utilities Cost (4)	Total Cost (5)=(1)+(2)+(3)+(4)	Dom. Pax Service Charge (6)	Int'l Pax Service Charge (7)	Int'l Bldg. Equipment Charge (8)	Dom. Bldg. Equipment Charge (9)	Int'l Bldg. Concession Fee (10)	Dom. Bldg. Concession Fee (11)	Car Parking Charge (12)	Int'l Pax Terminal Rent (13)	Dom. Pax Terminal Rent (14)	Adver-tisement Revenue (15)		Total Revenue (16)=(6)+(7)+(8)+(9)+(10)+(11)+(12)+(13)+(14)+(15)	(17)=(16)-(5)
1995																		
1996																		
1997	5,012				5,012													-5,012
1998	14,485				14,485													-14,485
1999	65,304				65,304													-65,304
2000	53,019				53,019													-53,019
2001		1,339	2,538	794	4,671	7,307	3,027	1,026	487	2,564	487	1,316	1,350	300	200	16,025	13,354	
2002		1,339	2,814	794	4,847	8,214	3,328	1,153	514	2,882	514	1,458	1,350	300	200	19,912	14,965	
2003		1,339	3,160	794	5,293	9,234	3,657	1,296	565	3,240	565	1,618	1,350	300	200	22,022	16,728	
2004		1,339	3,539	794	5,672	10,380	4,020	1,457	621	3,642	621	1,791	1,350	300	200	24,380	18,708	
2005		1,339	3,950	794	6,083	11,668	4,419	1,638	682	4,094	682	1,985	1,350	300	200	27,017	20,934	
2006		1,339	4,197	794	6,330	11,668	4,419	1,638	682	4,094	682	1,985	1,350	300	200	27,017	20,687	
2007		1,339	4,470	794	6,603	11,668	4,419	1,638	682	4,094	682	1,985	1,350	300	200	27,017	20,414	
2008		1,339	4,756	794	6,889	11,668	4,419	1,638	682	4,094	682	1,985	1,350	300	200	27,017	20,129	
2009		1,339	5,055	794	7,188	11,668	4,419	1,638	682	4,094	682	1,985	1,350	300	200	27,017	19,830	
2010		1,339	5,380	794	7,513	11,668	4,419	1,638	682	4,094	682	1,985	1,350	300	200	27,017	19,505	
2011		1,339	5,652	794	7,785	11,668	4,419	1,638	682	4,094	682	1,985	1,350	300	200	27,017	19,232	
2012		1,339	5,938	794	8,071	11,668	4,419	1,638	682	4,094	682	1,985	1,350	300	200	27,017	18,948	
2013		1,339	6,237	794	8,370	11,668	4,419	1,638	682	4,094	682	1,985	1,350	300	200	27,017	18,647	
2014		1,339	6,549	794	8,682	11,668	4,419	1,638	682	4,094	682	1,985	1,350	300	200	27,017	18,335	
2015	-54,450	1,339	6,874	794	-45,443	11,668	4,419	1,638	682	4,094	682	1,985	1,350	300	200	27,017	72,461	

Unit: US\$ '000

FIRR
NPV (at 8% discount rate)

10.1%
16,516

Appendix 7.6.8c Comparison of Costs and Revenues - T1 Project (Case C: Int'l PSC = US\$15, Dom. PSC = VND40,000)

Year	Costs					Revenues										Operating Profits				
	Const- tuction Cost (1)	Mainte- nance Cost (2)	Personnel, Overhead & Other Cost (3)	Utilities Cost (4)	Total Cost (5)=(1)+(2)+(3)+(4)	Int'l Pax Service Charge (6)	Dom. Pax Service Charge (7)	Int'l Bldg. Equipment Charge (8)	Dom. Bldg. Equipment Charge (9)	Int'l Bldg. Concession Fee (10)	Dom. Bldg. Concession Fee (11)	Car Parking Charge (12)	Int'l Pax Terminal Rent (13)	Dom. Pax Terminal Rent (14)	Adver- tise- ment Revenue (15)		Total Revenue (16)=(6)+(7)+(8)+(9)+(10)+(11)+(12)+(13)+(14)+(15)	(17)=(16)-(5)		
1995																				
1996	5,012				5,012															-5,012
1997	14,485				14,485															-14,485
1998	65,304				65,304															-65,304
2000	53,019				53,019															-53,019
2001		1,339	2,538	794	4,671	9,134	4,037	1,026	467	2,564	467	1,316	1,350	300	200	20,861				16,190
2002		1,339	2,814	794	4,947	10,287	4,437	1,153	514	2,892	514	1,458	1,350	300	200	23,075				18,128
2003		1,339	3,160	794	5,293	11,543	4,876	1,296	565	3,240	565	1,616	1,350	300	200	25,549				20,256
2004		1,339	3,539	794	5,672	12,975	5,360	1,457	621	3,842	621	1,791	1,350	300	200	28,315				22,643
2005		1,339	3,950	794	6,083	14,585	5,892	1,638	682	4,094	682	1,985	1,350	300	200	31,407				25,324
2006		1,339	4,187	794	6,330	14,585	5,892	1,638	682	4,094	682	1,985	1,350	300	200	31,407				25,077
2007		1,339	4,470	794	6,603	14,585	5,892	1,638	682	4,094	682	1,985	1,350	300	200	31,407				24,804
2008		1,339	4,756	794	6,889	14,585	5,892	1,638	682	4,094	682	1,985	1,350	300	200	31,407				24,518
2009		1,339	5,055	794	7,188	14,585	5,892	1,638	682	4,094	682	1,985	1,350	300	200	31,407				24,220
2010		1,339	5,380	794	7,513	14,585	5,892	1,638	682	4,094	682	1,985	1,350	300	200	31,407				23,985
2011		1,339	5,652	794	7,785	14,585	5,892	1,638	682	4,094	682	1,985	1,350	300	200	31,407				23,622
2012		1,339	5,938	794	8,071	14,585	5,892	1,638	682	4,094	682	1,985	1,350	300	200	31,407				23,398
2013		1,339	6,237	794	8,370	14,585	5,892	1,638	682	4,094	682	1,985	1,350	300	200	31,407				23,037
2014		1,339	6,549	794	8,682	14,585	5,892	1,638	682	4,094	682	1,985	1,350	300	200	31,407				22,725
2015	-54,650		6,874	794	-45,443	14,585	5,892	1,638	682	4,094	682	1,985	1,350	300	200	31,407				78,950

FIRR
NPV (at 8% discount rate)

12.7%
37,983

Appendix 9.7.1 Air Traffic at Noi Bai International Airport in the WP Case

Year	Passengers										Cargo (ton)										Aircraft Movements															
	Int'l		Dom.		Total		Int'l		Dom.		Total		JJ		LJ		MJ		SJ		TP		Total		JJ		LJ		MJ		SJ		TP		Total	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)																		
1995	472,000	950,000	1,422,000	6,600	15,600	22,200	180	690	340	2,400	510	4,120	630	630	5,920	3,500	10,680																			
1996	537,000	1,202,000	1,739,000	8,400	21,200	29,600	250	860	430	2,920	620	5,080	1,190	1,190	6,660	3,530	12,570																			
1997	713,000	1,455,000	2,168,000	10,700	27,300	38,000	330	1,050	520	3,460	740	6,100	1,870	1,870	7,180	3,340	14,260																			
1998	849,000	1,698,000	2,547,000	13,400	32,900	46,300	440	1,250	620	4,020	850	7,160	2,590	2,590	7,510	2,970	15,660																			
1999	992,000	1,923,000	2,915,000	16,400	38,100	54,500	560	1,460	730	4,580	960	8,290	3,320	3,320	7,720	2,470	16,830																			
2000	1,141,000	2,126,000	3,267,000	19,700	42,900	62,600	710	1,690	840	5,120	1,070	9,430	4,070	4,070	7,360	2,480	17,980																			
2001	1,282,000	2,337,000	3,619,000	23,200	47,800	71,000	850	1,900	950	5,610	1,160	10,470	4,920	4,920	6,730	2,620	19,190																			
2002	1,441,000	2,569,000	4,010,000	27,200	53,200	80,400	1,040	2,150	1,070	6,120	1,260	11,640	5,900	5,900	5,870	2,770	20,440																			
2003	1,620,000	2,923,000	4,443,000	31,900	59,300	91,200	1,260	2,420	1,210	6,650	1,360	12,900	6,860	6,860	5,080	2,910	21,800																			
2004	1,821,000	3,103,000	4,924,000	37,300	65,800	103,100	1,530	2,730	1,360	7,200	1,460	14,280	7,320	7,320	5,240	3,060	23,480																			
2005	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	5,320	3,210	25,260																			
2006	2,257,000	3,709,000	5,966,000	50,000	80,200	130,200	2,190	3,410	1,700	8,220	1,630	17,150	8,290	8,290	5,310	3,340	26,980																			
2007	2,489,000	4,032,000	6,521,000	57,300	88,100	145,400	2,580	3,770	1,890	8,660	1,690	18,590	8,780	8,780	5,180	3,460	28,600																			
2008	2,745,000	4,384,000	7,129,000	65,500	96,700	162,200	3,040	4,180	2,090	9,080	1,750	20,140	9,320	9,320	4,930	3,590	30,380																			
2009	3,027,000	4,767,000	7,794,000	74,900	106,100	181,000	3,580	4,620	2,310	9,470	1,790	21,770	9,890	9,890	4,520	3,700	32,200																			
2010	3,337,000	5,183,000	8,520,000	85,800	116,600	202,400	4,210	5,120	2,560	9,810	1,810	23,510	10,490	10,490	3,940	3,790	34,040																			
2011	3,616,000	5,541,000	9,157,000	96,100	126,000	222,100	4,810	5,570	2,790	10,030	1,810	25,010	10,960	10,960	3,390	3,890	35,590																			
2012	3,917,000	5,925,000	9,842,000	107,500	136,200	243,700	5,490	6,060	3,030	10,200	1,790	26,570	11,450	11,450	2,700	3,960	37,180																			
2013	4,244,000	6,335,000	10,579,000	120,400	147,100	267,500	6,270	6,590	3,300	10,290	1,750	28,200	11,950	11,950	1,960	4,080	38,780																			
2014	4,598,000	6,774,000	11,372,000	134,700	158,900	293,500	7,140	7,170	3,590	10,290	1,680	29,870	12,470	12,470	850	4,180	40,420																			
2015	4,981,000	7,243,000	12,224,000	150,800	171,600	322,400	8,130	7,800	3,900	10,200	1,570	31,500	12,720	12,720	190	4,270	42,180																			
2016	5,337,000	7,713,000	13,050,000	164,500	184,900	349,400	9,090	8,400	4,200	10,020	1,460	33,170	12,470	12,470	260	4,430	44,090																			
2017	5,718,000	8,215,000	13,933,000	179,500	199,400	378,900	10,150	9,030	4,510	9,740	1,310	34,740	12,110	12,110	340	4,590	46,060																			
2018	6,127,000	8,749,000	14,876,000	195,800	215,200	411,000	11,340	9,710	4,860	9,330	1,120	36,360	11,620	11,620	430	4,740	48,060																			
2019	6,127,000	8,749,000	14,876,000	195,800	215,200	411,000	11,340	9,710	4,860	9,330	1,120	36,360	11,620	11,620	430	4,740	48,060																			
2020	6,127,000	8,749,000	14,876,000	195,800	215,200	411,000	11,340	9,710	4,860	9,330	1,120	36,360	11,620	11,620	430	4,740	48,060																			
2021	6,127,000	8,749,000	14,876,000	195,800	215,200	411,000	11,340	9,710	4,860	9,330	1,120	36,360	11,620	11,620	430	4,740	48,060																			
2022	6,127,000	8,749,000	14,876,000	195,800	215,200	411,000	11,340	9,710	4,860	9,330	1,120	36,360	11,620	11,620	430	4,740	48,060																			
2023	6,127,000	8,749,000	14,876,000	195,800	215,200	411,000	11,340	9,710	4,860	9,330	1,120	36,360	11,620	11,620	430	4,740	48,060																			
2024	6,127,000	8,749,000	14,876,000	195,800	215,200	411,000	11,340	9,710	4,860	9,330	1,120	36,360	11,620	11,620	430	4,740	48,060																			
2025	6,127,000	8,749,000	14,876,000	195,800	215,200	411,000	11,340	9,710	4,860	9,330	1,120	36,360	11,620	11,620	430	4,740	48,060																			

Appendix 9.7.2 Air Traffic at Noi Bai International Airport in the WOP Case

Year	Passengers					Cargo (ton)					Aircraft Movements											
	Dom.		Total		Int'l	Dom.		Total		Int'l	International						Domestic					
	(19)	(20)	(21)	(22)		(23)	(24)	(25)	(26)		(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)		
1995	472,000	950,000	1,422,000	6,600	15,600	22,200	180	690	340	2,400	510	4,120	630	630	630	5,920	3,500	10,660				
1996	587,000	1,202,000	1,789,000	8,400	21,200	29,600	250	860	430	2,920	620	5,080	1,190	1,190	1,190	6,660	3,530	12,570				
1997	713,000	1,455,000	2,168,000	10,700	27,300	38,000	330	1,050	520	3,460	740	6,100	1,870	1,870	1,870	7,180	3,340	14,260				
1998	849,000	1,698,000	2,547,000	13,400	32,900	46,300	440	1,250	620	4,020	850	7,180	2,590	2,590	2,590	7,510	2,970	15,660				
1999	992,000	1,923,000	2,915,000	16,400	38,100	54,500	560	1,460	730	4,590	960	8,290	3,320	3,320	3,320	7,720	2,470	16,830				
2000	1,141,000	2,126,000	3,267,000	19,700	42,900	62,600	710	1,690	840	5,120	1,070	9,430	4,070	4,070	4,070	7,360	2,480	17,960				
2001	1,282,000	2,337,000	3,619,000	23,200	47,600	71,000	850	1,900	960	5,610	1,160	10,470	4,920	4,920	4,920	6,730	2,620	19,190				
2002	1,441,000	2,569,000	4,010,000	27,200	53,200	80,400	1,040	2,150	1,070	6,120	1,260	11,640	5,900	5,900	5,900	5,870	2,770	20,440				
2003	1,620,000	2,823,000	4,443,000	31,900	59,300	91,200	1,260	2,420	1,210	6,650	1,360	12,900	6,960	6,960	6,960	5,080	2,910	21,800				
2004	1,821,000	3,103,000	4,924,000	37,300	65,800	103,100	1,530	2,730	1,360	7,200	1,460	14,280	7,320	7,320	7,320	5,240	3,060	23,480				
2005	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	7,810	5,320	3,210	25,260				
2006	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	7,810	5,320	3,210	25,260				
2007	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	7,810	5,320	3,210	25,260				
2008	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	7,810	5,320	3,210	25,260				
2009	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	7,810	5,320	3,210	25,260				
2010	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	7,810	5,320	3,210	25,260				
2011	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	7,810	5,320	3,210	25,260				
2012	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	7,810	5,320	3,210	25,260				
2013	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	7,810	5,320	3,210	25,260				
2014	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	7,810	5,320	3,210	25,260				
2015	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	7,810	5,320	3,210	25,260				
2016	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	7,810	5,320	3,210	25,260				
2017	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	7,810	5,320	3,210	25,260				
2018	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	7,810	5,320	3,210	25,260				
2019	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	7,810	5,320	3,210	25,260				
2020	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	7,810	5,320	3,210	25,260				
2021	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	7,810	5,320	3,210	25,260				
2022	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	7,810	5,320	3,210	25,260				
2023	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	7,810	5,320	3,210	25,260				
2024	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	7,810	5,320	3,210	25,260				
2025	2,047,000	3,411,000	5,458,000	43,600	73,100	116,700	1,860	3,080	1,540	7,760	1,550	15,790	7,810	7,810	7,810	5,320	3,210	25,260				

Appendix 9.7.4 Annual Requirements of Capital Investment Cost - Alternative-2(a)

Unit: US\$ '000

Year	Airport Civil Works (1)	Building Works (2)	Special Equipment (3)	Airport Utilities (4)	Fuel Supply System (5)	Fire Fighting Vehicles (6)	Airport Maint. Equipment (7)	Air Navigation System (8)	Diversion and Relocation (9)	Land Acquisition and Comp. (10)	Consulting Services (11)	Contin. gencies (12)	Total (13)=(1)+(2)+(3)+(4)+(5)+(6)+(7)+(8)+(9)+(10)+(11)+(12)
1995													
1996										1,175	1,749	117	1,292
1997										9,396	10,494	1,115	12,260
1998										9,396	10,494	1,989	21,879
1999										2,349	2,449	480	3,277
2000										1,175	2,449	1,492	5,116
2001	8,753	9,569		1,110	3,520				1,428		4,547	7,015	16,411
2002	43,790	28,707	2,373	4,440	3,280			3,540	4,264		4,547	10,398	77,165
2003	52,548	38,276	5,945	6,660	5,280	1,050		8,650	1,428		5,247	12,406	114,376
2004	52,548	19,138	3,567	4,440	3,520	1,050		5,310			3,148	5,789	136,462
2005	17,316									972	350	132	63,676
2006										324	2,260	258	1,454
2007										648	2,260	1,666	2,842
2008	5,907	7,844		2,450	10,000			3,250		648	2,260	4,020	18,325
2009	5,907	15,688	2,100	2,450	10,000			3,250		648	2,260	4,230	44,223
2010	5,907	15,688											46,533
2011													
2012													
2013													
2014													
2015													
2016													
2017													
2018													
2019													
2020													
2021													
2022													
2023													
2024													
2025													
Total	-67,241	95,690	11,890	22,200	17,600	2,100	400	17,700	7,140	23,490	34,980	40,650	-118,744
Medium-term	175,160	39,220	2,100	4,900	20,000			6,500		3,240	9,040	10,280	449,000
Long-term													

Total cost of each work is distributed by the following percentage distribution rates based on the anticipated implementation schedule of the Project.

Year	Medium-term Development		Long-term Development		Fuel	FFV	Mant. Eq.	Nav aids	Other	Compen.	Consul.
	Civil	Building	Special Eq.	Utilities							
1997											
1998										5%	5%
1999										40%	40%
2000										40%	30%
2001										10%	7%
2002										5%	7%
2003										20%	13%
2004										60%	13%
2005										20%	15%
2006										50%	15%
2007										50%	9%
2008										1%	1%
2009										30%	25%
2010										10%	25%
2011										20%	25%
2012										33%	25%
2013										33%	25%
2014										33%	25%
2015										33%	25%
2016										33%	25%
2017										33%	25%
2018										33%	25%
2019										33%	25%
2020										33%	25%
2021										33%	25%
2022										33%	25%
2023										33%	25%
2024										33%	25%
2025										33%	25%

Contingencies (10% of each work) are assumed to be used at each time of construction/installation/compensation/consulting work.

Note 2: Residual values are considered for airport civil facilities and buildings with 30 year depreciation period.

Note 3:

Appendix 9.7.5 Incremental Maintenance Cost by the Project - Alternative-2(a)

Year	Airport Civil Works (1)	Building Works (2)	Special Equipment (3)	Airport Utilities (4)	Fuel Supply System (5)	Fire Fighting Vehicles (6)	Airport Mainte. Equipment (7)	Air Navigation System (8)	Total (9)=(1)+(2)+(3)+(4)+(5)+(6)+(7)+(8)
1995									
1996									
1997									
1998									
1999									
2000									
2001									
2002									
2003									
2004									
2005									
2006	1,752	967	595	222	528	63	12	885	5,013
2007	1,752	957	595	222	528	63	12	885	5,013
2008	1,752	967	595	222	528	63	12	885	5,013
2009	1,752	957	595	222	528	63	12	885	5,013
2010	1,752	957	595	222	528	63	12	885	5,013
2011	1,929	1,349	700	271	1,128	63	12	1,210	6,661
2012	1,929	1,349	700	271	1,128	63	12	1,210	6,661
2013	1,929	1,349	700	271	1,128	63	12	1,210	6,661
2014	1,929	1,349	700	271	1,128	63	12	1,210	6,661
2015	1,929	1,349	700	271	1,128	63	12	1,210	6,661
2016	1,929	1,349	700	271	1,128	63	12	1,210	6,661
2017	1,929	1,349	700	271	1,128	63	12	1,210	6,661
2018	1,929	1,349	700	271	1,128	63	12	1,210	6,661
2019	1,929	1,349	700	271	1,128	63	12	1,210	6,661
2020	1,929	1,349	700	271	1,128	63	12	1,210	6,661
2021	1,929	1,349	700	271	1,128	63	12	1,210	6,661
2022	1,929	1,349	700	271	1,128	63	12	1,210	6,661
2023	1,929	1,349	700	271	1,128	63	12	1,210	6,661
2024	1,929	1,349	700	271	1,128	63	12	1,210	6,661
2025	1,929	1,349	700	271	1,128	63	12	1,210	6,661

Note: Maintenance cost is estimated by the following percentage rates on the construction cost of each airport facility.

Airport Civil Works	1%
Building Works	1%
Special Equipment	5%
Airport Utilities	1%
Fuel Supply System	3%
Fire Fighting Vehicles	3%
Airport Maintenance Equipment	3%
Air Navigation System	5%

Appendix 9.7.6 Incremental Personnel Cost, Overhead and Other Labor Costs by the Project

Year	W.P					W.O.P					Incremental Cost (000 US\$)					
	Unit Staff Cost (US\$/Year)	Passengers	Cargo (ten)	Traffic Units	Traffic Unit Growth	Productivity Improvement	Staff Growth Rate	Number of Staff	Personnel Cost (000 US\$)	Overhead Cost (000 US\$)		Other Cost (001 US\$)	Number of Staff	Personnel Cost (000 US\$)	Overhead Cost (000 US\$)	Other Cost (001 US\$)
	(1)	(2)	(3)	(4)=(2)/1000	(5)	(6)	(7)=(5)-(6)	(8)	(9)=(1)x(8)	(10)	(11)	(12)	(13)=(1)x(1)	(14)	(15)	(16)=(9)+(10)+(11)-(13)-(14)-(15)
1995	1,500	1,422,000	22,200	1,644	26.8%	7.5%	19.3%	433	650	331	149	433	650	331	149	0
1996	1,610	1,789,000	29,600	2,085	26.8%	7.5%	19.3%	520	837	427	193	520	837	427	193	0
1997	1,730	2,168,000	38,000	2,548	22.2%	7.5%	14.7%	600	1,038	529	239	600	1,038	529	239	0
1998	1,860	2,547,000	46,300	3,010	18.1%	7.5%	10.6%	660	1,228	626	282	660	1,228	626	282	0
1999	2,000	2,915,000	54,500	3,460	15.0%	7.5%	7.5%	710	1,420	724	327	710	1,420	724	327	0
2000	2,150	3,287,000	62,600	3,893	12.5%	7.5%	5.0%	750	1,613	822	371	750	1,613	822	371	0
2001	2,300	3,679,000	71,000	4,329	11.2%	7.2%	4.0%	780	1,794	915	413	780	1,794	915	413	0
2002	2,470	4,010,000	80,400	4,814	11.2%	7.2%	4.0%	810	2,001	1,020	460	810	2,001	1,020	460	0
2003	2,650	4,443,000	91,200	5,355	11.2%	7.2%	4.0%	840	2,226	1,135	512	840	2,226	1,135	512	0
2004	2,840	4,924,000	103,100	5,955	11.2%	7.2%	4.0%	870	2,471	1,260	568	870	2,471	1,260	568	0
2005	3,040	5,458,000	116,700	6,623	11.3%	7.2%	4.1%	910	2,766	1,411	636	910	2,766	1,411	636	0
2006	3,230	5,968,000	130,200	7,263	9.7%	6.3%	3.4%	940	3,036	1,548	698	940	3,036	1,548	698	169
2007	3,430	6,521,000	145,400	7,975	9.7%	6.3%	3.4%	970	3,327	1,697	765	970	3,327	1,697	765	358
2008	3,650	7,129,000	162,200	8,751	9.7%	6.3%	3.4%	1,000	3,650	1,862	840	1,000	3,650	1,862	840	572
2009	3,880	7,794,000	181,000	9,604	9.7%	6.3%	3.4%	1,030	3,996	2,038	919	1,030	3,996	2,038	919	810
2010	4,120	8,520,000	202,400	10,544	9.8%	6.3%	3.5%	1,070	4,408	2,248	1,014	1,070	4,408	2,248	1,014	1,147
2011	4,340	9,317,000	222,100	11,378	7.9%	5.4%	2.5%	1,100	4,774	2,435	1,098	1,100	4,774	2,435	1,098	1,436
2012	4,570	9,842,000	243,700	12,279	7.9%	5.4%	2.5%	1,130	5,164	2,634	1,188	1,130	5,164	2,634	1,188	1,749
2013	4,820	10,579,000	267,500	13,254	7.9%	5.4%	2.5%	1,160	5,591	2,852	1,286	1,160	5,591	2,852	1,286	2,097
2014	5,080	11,372,000	293,500	14,307	7.9%	5.4%	2.5%	1,190	6,045	3,083	1,390	1,190	6,045	3,083	1,390	2,475
2015	5,350	12,224,000	322,400	15,448	8.0%	5.4%	2.6%	1,220	6,527	3,329	1,501	1,220	6,527	3,329	1,501	2,886
2016	5,620	13,050,000	349,600	16,544	7.1%	5.0%	2.1%	1,250	7,025	3,583	1,616	1,250	7,025	3,583	1,616	3,325
2017	5,900	13,933,000	378,900	17,722	7.1%	5.0%	2.1%	1,280	7,552	3,852	1,737	1,280	7,552	3,852	1,737	3,798
2018	6,200	14,876,000	411,000	18,986	7.1%	5.0%	2.1%	1,310	8,122	4,142	1,868	1,310	8,122	4,142	1,868	4,315
2019	6,510	14,876,000	411,000	18,986	7.1%	5.0%	2.1%	1,310	8,528	4,349	1,961	1,310	8,528	4,349	1,961	4,531
2020	6,840	14,876,000	411,000	18,986	7.1%	5.0%	2.1%	1,310	8,960	4,570	2,061	1,310	8,960	4,570	2,061	4,761
2021	7,180	14,876,000	411,000	18,986	7.1%	5.0%	2.1%	1,310	9,406	4,797	2,163	1,310	9,406	4,797	2,163	4,997
2022	7,540	14,876,000	411,000	18,986	7.1%	5.0%	2.1%	1,310	9,877	5,037	2,272	1,310	9,877	5,037	2,272	5,248
2023	7,920	14,876,000	411,000	18,986	7.1%	5.0%	2.1%	1,310	10,375	5,291	2,386	1,310	10,375	5,291	2,386	5,512
2024	8,320	14,876,000	411,000	18,986	7.1%	5.0%	2.1%	1,310	10,899	5,559	2,507	1,310	10,899	5,559	2,507	5,791
2025	8,740	14,876,000	411,000	18,986	7.1%	5.0%	2.1%	1,310	11,449	5,839	2,633	1,310	11,449	5,839	2,633	6,083

Note 1: Personnel cost includes basic salaries, bonuses, pension and insurance.

The average cost is estimated to increase at the same rate GDP per capita growth rate as follows:

1995-2000	7.5%	per annum	2005-2010	6.3%	per annum	2015-2020	5.0%	per annum
2000-2005	7.2%	per annum	2010-2015	5.4%	per annum	2020-2025	5.0%	per annum

Note 2: Traffic unit is defined as 1/1000 of annual number of passengers plus 1/100 of annual tonnage of cargo.

Note 3: The number of staff is assumed to increase in proportion with the growth of traffic units less productivity improvement of the staff, which is equal to the increase in their real income.

Note 4: The number of staff in 1995 is the indicative staffing target by the organizational study in Section 13.6.3, in stead of the actual number of 856.

Note 5: Overhead cost includes professional management expenditure, travel cost, stationary supply, telephone charge, uniform, land tax and training cost.

Note 6: Other labor cost includes payments to workers for cleaning and gardening of terminal area, etc. It is estimated as 23% of personnel cost based on the financial statement of the NAR in 1994.

Appendix 9.7.7 Incremental Utilities Cost by the Project

Year	WP				WOP				Incremental Utility Expenses ('000 US\$)
	Electricity Consump. (MVAH)	Electricity Cost ('000 US\$)	Fuel Cost ('000 US\$)	Total Cost ('000 US\$)	Electricity Consump. (MVAH)	Electricity Cost ('000 US\$)	Fuel Cost ('000 US\$)	Total Cost ('000 US\$)	
	(1)	(2)	(3)	(4)=(2)+(3)	(5)	(6)	(7)	(8)=(6)+(7)	
1995	5,500	275	14	289	5,500	275	14	289	
1996	5,500	275	14	289	5,500	275	14	289	
1997	5,500	275	14	289	5,500	275	14	289	
1998	5,500	275	14	289	5,500	275	14	289	
1999	5,500	275	14	289	5,500	275	14	289	
2000	5,500	275	14	289	5,500	275	14	289	
2001	20,100	1,005	50	1,055	20,100	1,005	50	1,055	
2002	20,100	1,005	50	1,055	20,100	1,005	50	1,055	
2003	20,100	1,005	50	1,055	20,100	1,005	50	1,055	
2004	20,100	1,005	50	1,055	20,100	1,005	50	1,055	
2005	20,100	1,005	50	1,055	20,100	1,005	50	1,055	
2006	28,600	1,430	72	1,502	20,100	1,005	50	1,055	446
2007	28,600	1,430	72	1,502	20,100	1,005	50	1,055	446
2008	28,600	1,430	72	1,502	20,100	1,005	50	1,055	446
2009	28,600	1,430	72	1,502	20,100	1,005	50	1,055	446
2010	28,600	1,430	72	1,502	20,100	1,005	50	1,055	446
2011	38,500	1,925	96	2,021	20,100	1,005	50	1,055	966
2012	38,500	1,925	96	2,021	20,100	1,005	50	1,055	966
2013	38,500	1,925	96	2,021	20,100	1,005	50	1,055	966
2014	38,500	1,925	96	2,021	20,100	1,005	50	1,055	966
2015	38,500	1,925	96	2,021	20,100	1,005	50	1,055	966
2016	38,500	1,925	96	2,021	20,100	1,005	50	1,055	966
2017	38,500	1,925	96	2,021	20,100	1,005	50	1,055	966
2018	38,500	1,925	96	2,021	20,100	1,005	50	1,055	966
2019	38,500	1,925	96	2,021	20,100	1,005	50	1,055	966
2020	38,500	1,925	96	2,021	20,100	1,005	50	1,055	966
2021	38,500	1,925	96	2,021	20,100	1,005	50	1,055	966
2022	38,500	1,925	96	2,021	20,100	1,005	50	1,055	966
2023	38,500	1,925	96	2,021	20,100	1,005	50	1,055	966
2024	38,500	1,925	96	2,021	20,100	1,005	50	1,055	966
2025	38,500	1,925	96	2,021	20,100	1,005	50	1,055	966

Note 1: Annual consumption of electricity is calculated from the receiving capacity by multiplying the use rate of 33.3%.

Note 2: The rate of electricity is US\$0.05 per KWH

Note 3: Fuel cost is 5% of electricity expenses.