

Capstone Project

Prishtina International Airport Capacity Expansions and Service Standards

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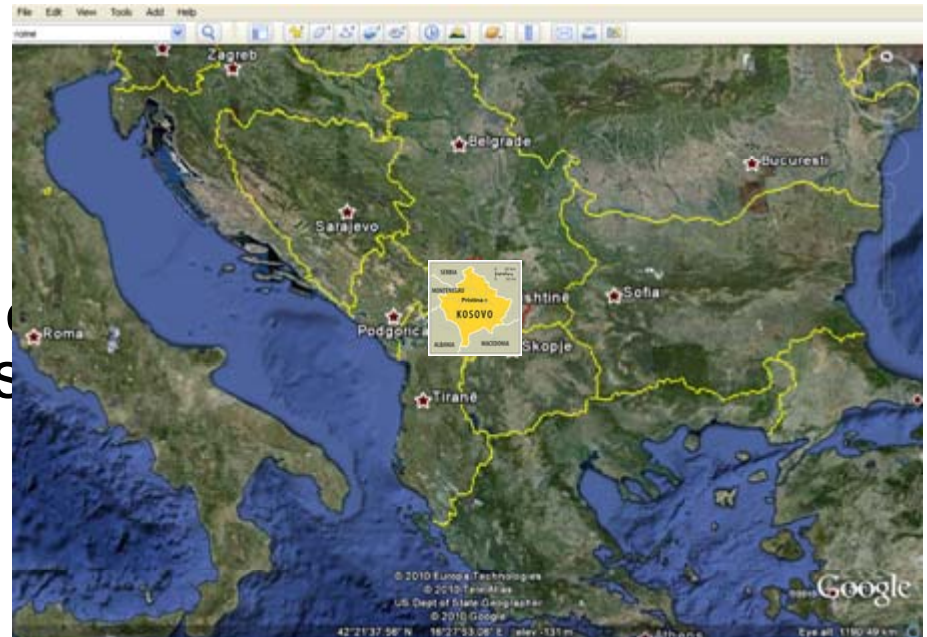
AIRPORT

Population: 2 Millions

GDP: per capita is €1,726 (\$2,346), a number that reflects only 6.9 percent of the EU-27 average, real growth is estimated to be 4%.

Diaspora: about 17% of Kosovars live abroad, about 30% of Kosovar households have one or more their members living abroad

Remittances: The total annual inflow is around €317 million, or approximately 14% of Kosova GDP.



Regional centers	Travelling distance from Prishtina(Km)
Skopje	86
Sofia	279
Thessaloniki	312
Tirana	265
Belgrade	355
Durres	290
Sarajevo	390

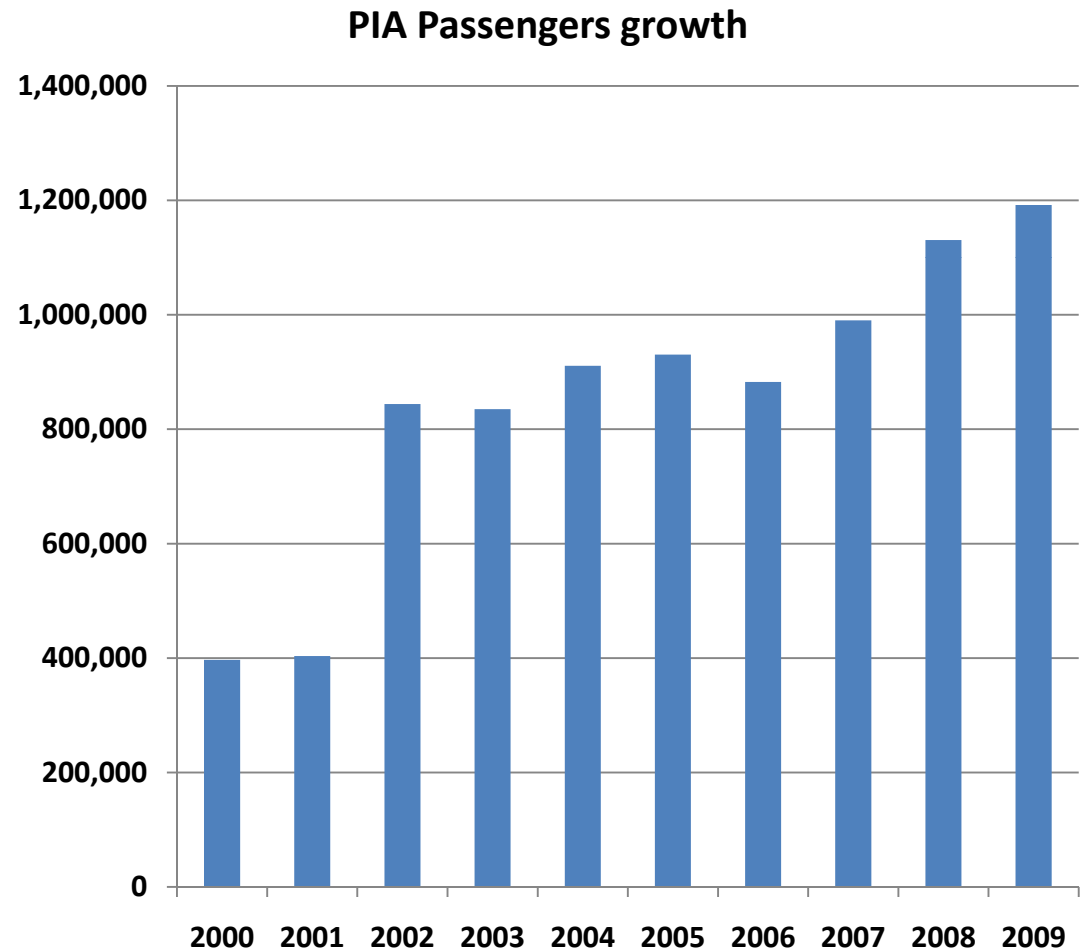
TRAFFIC GROWTH AND PROBLEMS

Results:

- Capacity constrains
- Delays
- Decrease in passengers satisfaction

Challenge:

- Increase capacity
- Improve service



Public Private Partnership

The Government of Kosovo seeks to ensure that the Airport meets its full economic and operational potential. For this reason, on June 12, 2009, via Government Decision 05/68, the Government of Kosovo formally authorized proceeding with a Public-Private-Partnership.

The Project is envisioned to take the form of a 20-year Design-Build-Finance-Operate-Transfer (DBFOT).

Minimum Performance and Capacity Levels: IATA level C (good level of service)

PROJECT OBJECTIVES

- Forecast the capacity required for short and long term
- Provide a service oriented approach to capacity building and planning
- Provide optimum investment plan for future development

FORECASTING

Forecasting is the heart of planning.

Forecasts are necessary to define the facilities that will be required, the scale of such facilities, and the time at which they will be required.

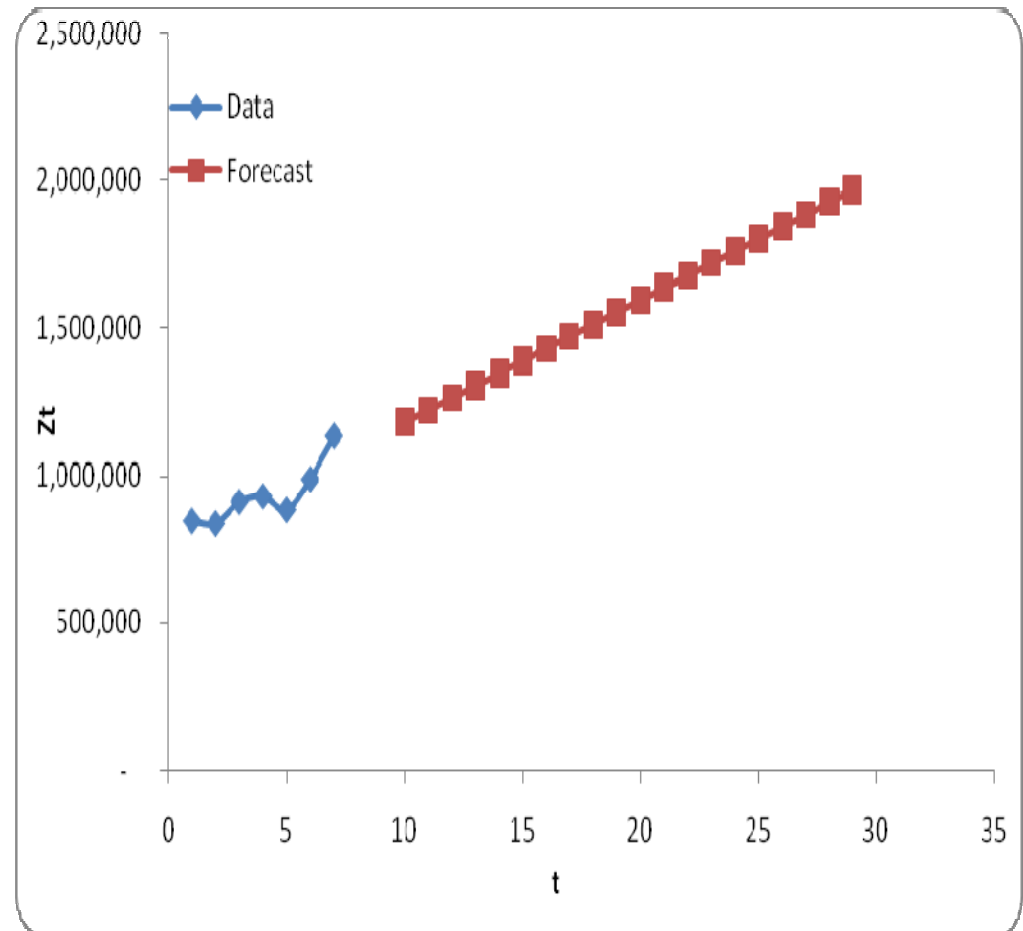
- Econometric Models
- Market Surveys
- Trend analyses
- Expert judgments

TRENDLINE ANALYSES

- Trend

Regression Statistics	
R^2	0.7359
Slope	41467.36
Intercept	767025.9

Forecast for selected t	
t	Pax
2015	1,389,036
2020	1,596,373
2025	1,803,710
2030	2,011,047



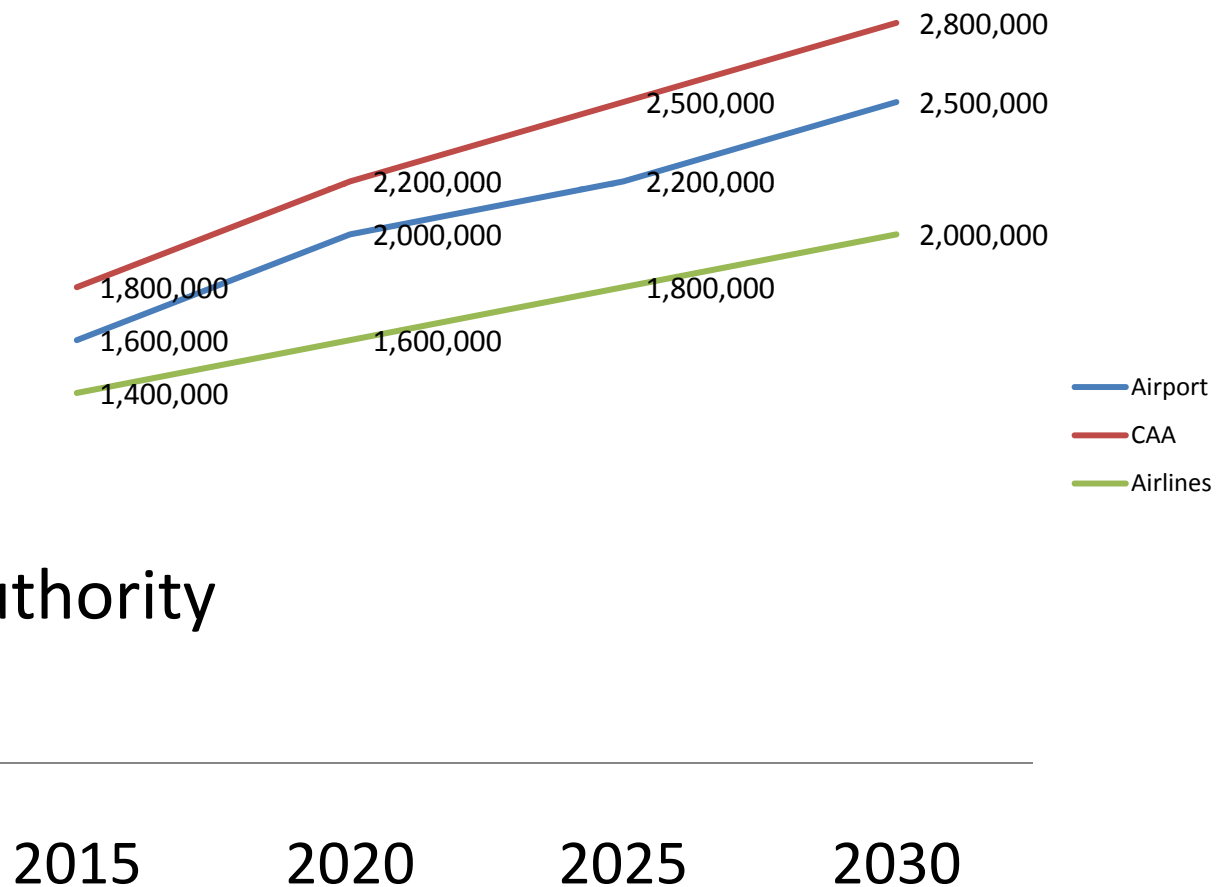
EXPERT OPINION!

Forecast Projection

- Airport

- Airlines

- Civil Aviation Authority



FORECASTING

Low traffic growth :There is potential for development but because of political uncertainties, strong competition from the modern motorway, decrease in number of Diaspora travelling

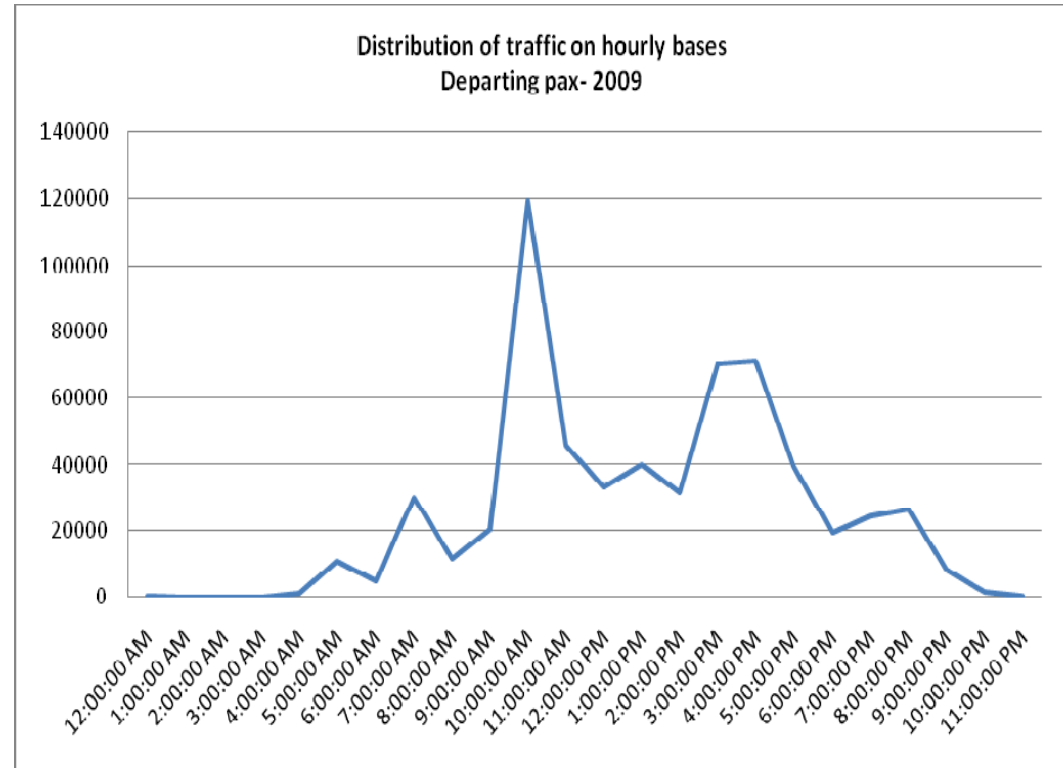
Medium traffic growth-The future development in economic and political area with effect the traffic growth positively and unleash the potencies for air travel, negative factors are taken into the consideration.

High traffic growth: Kosovo with become member of EU and also reach at high development level attracting foreign investment and become favorite destination for emigrants and tourism

	Low Scenario	Mid Scenario	High Scenario
2015	1.400,000	1.600.000	1,800,000
2020	1,600.000	2.000.000	2.300.000
2025	1,800.000	2.200.000	2.800.000
2030	2.000.000	2.500.000	3.000.000

PEAK HOURS

- **IATA- SBR**(Standard Busy Rate) (IATA ,1998) where the 30th busiest hour in the year is considered to be the peak hour. The facilities should be able to serve the traffic for all but 29 hours out of 87600 hours
- **BAA** - uses the BHR (busy hour rate)- Facilities and design must be ready to process efficiently 95 % of passengers.



Nr	DATE	ROUND TIME	Sum of D-PAX
1	1/11/2009	4:00:00 PM	885
2	1/10/2009	3:00:00 PM	873
3	1/11/2009	3:00:00 PM	852
4	8/16/2009	4:00:00 PM	848
5	1/4/2009	3:00:00 PM	840
30	4/12/2009	10:00:00 AM	661
41	10/17/2009	11:00:00 AM	624

Forecasting

2015	Low Scenario	Mid Scenario	High Scenario
Annual Passengers	1,400,000	1,600,000	1,800,000
Annua Dep Pax	721,000	824,000	927,000
Peak month dep pax	122,570	140,080	157,590
Average day	3,922	4,483	5,043
Busy Day	7,109	8,125	9,140
Peak Hour	730	834	938

2020	Low Scenario	Mid Scenario	High Scenario
Annual Passengers	1,600,000	2,000,000	2,300,000
Annua Dep Pax	824,000	1,030,000	1,184,500
Peak month dep pax	140,080	175,100	201,365
Average day	4,483	5,603	6,444
Busy Day	8,125	10,156	11,679
Peak Hour	834	1,042	1,199

2025	Low Scenario	Mid Scenario	High Scenario
Annual Passengers	1,800,000	2,200,000	2,800,000
Annual Dep Pax	927,000	1,133,000	1,442,000
Peak month dep pax	157,590	192,610	245,140
Average day	5,043	6,164	7,844
Busy Day	9,140	11,171	14,218
Peak Hour	938	1,146	1,459

2030	Low Scenario	Mid Scenario	High Scenario
Annual Passengers	2,000,000	2,500,000	3,000,000
Annua Dep Pax	1,030,000	1,287,500	1,545,000
Peak month dep pax	175,100	218,875	262,650
Average day	5,603	7,004	8,405
Busy Day	10,156	12,695	15,234
Peak Hour	1,042	1,303	1,563

Service Standards

Definition:

- **ACI**- The ACI survey seeks to measure passengers' overall satisfaction with an airport by ranking its performance against other airports in terms of various aspects of an airport's services
- **IATA**- It defines six levels of service standard, The six IATA standards from A to E measure, in terms of m² per occupant

A – An excellent level of service.

B – High level of service.

C – Good level of service.

D – Adequate level of service.

E – Inadequate level of service.

F – Unacceptable level of service..

Service Standards

IATA

	A	B	C	D	E	F
Check-In Queue With 2+ Bags (Counter)	2.6	2.3	2.0	1.9	1.8	0
Check-In Queue With Few Bags (Self Service)	1.8	1.5	1.3	1.2	1.1	0
Wait/Circulate (With Carts)	3.3	2.8	2.3	1.8	1.2	0
Wait/Circulate	2.6	2.2	1.8	1.4	0.9	0
Holdroom	2.6	2.1	1.6	1.3	1	0
Bag Claim Area	2.6	2	1.7	1.3	1	0

No	Description of variables	Value
1	Peak Number of passengers	625
2	Proportion of passengers using car/taxi	0.7
3	<i>Average Number of passengers per car/taxi</i>	1.7
4	<i>Average occupancy time per passengers/visitors (minutes)</i>	20
5	<i>Average curb occupancy time per car/taxi (minutes)</i>	1.5
6	<i>Number of visitors per passengers</i>	1.5
7	<i>Average processing time per passengers CHECK-in (minutes)</i>	2

Baggage claim area

BAGGAGE CLAIM AREA

Data Required:

e = Peak Hour number of passengers 625.00

w = Average occupancy time per passengers (minutes) 30.00

s = Space required per passengers (m²) 1.80

$$A = \frac{ews}{60} = \frac{e \times 30 \times 1.8}{60} = 0.9 e \text{ m}^2 (+10\%)$$

A =

618.75¹⁴

Calculating demand

PASSPORT CONTROL –ARRIVAL

Data Required:

d = Peak Hour number of passengers 625

t3= average processing time per passengers (minutes) 0.50

Control Positions required:

$$\frac{d \times t_3}{60} \text{ positions (+10\%)}$$

M= 5.73

CHECK-IN DESKS

Data required:

a = Peak hour number of passengers 625

t1= Average processing time per passengers (minutes) 2

$$N = \frac{(a+b)t_1}{60}, \text{ Desks (+10\%)}$$

Desk Required:

N= 20.83

N + 10% 22.92

QUEUING AREA-CHECK-IN

a = Peak hour number of passengers 625

s = Space required per passengers (m2) 1.5

$$A = s \times \frac{20}{60} \times \left(\frac{a(a+b) - (a+b)^2}{2} \right) = 0.25 (a + b)m^2$$

A= QUEUING AREA-CHECK-IN 171.9

DEPARTURE CONCOURSE

Data required:

a = Peak Hour number of passengers 625

y = Average occupancy time per passengers/visitors (minutes) 20

s = Space required per person (m2) 1.5

o = Number of visitors per passengers 1.5

$$\frac{y}{60} \times \frac{3(a(1+o)+b)}{2} = 0.75 (a(1+o) + b)m^2$$

1.5

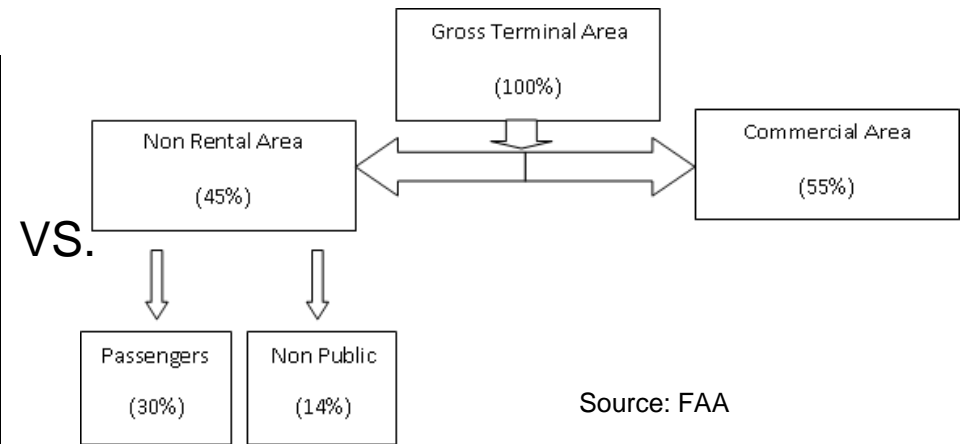
1171.8

A = DEPARTURE CONCOURSE 75

	Year		2010	2010	2015	2020	2025	2030
	Peak	Unit	Actual	625	834	1042	1146	1303
1	DEPARTURE CURBS	m2	30	48	61	76	84	95
2	DEPARTURE CONCOURSE	m2	240	1,219	1,564	1,954	2,149	2,443
3	QUEUING AREA-CHECK-IN	m2	240	179	229	287	315	358
4	CHECK-IN DESKS	pcs	14	24	31	38	42	48
5	PASSPORT CONTROL	m2	4	4	5	6	6	7
6	SECURITY CHECK	pcs	2	2	3	3	4	4
7	DEPARTURE LOUNGE	m2	480	1,001	1,284	1,605	1,765	2,007
8	SECURITY CHECK – GATE HOLD ROOM	pcs	1	1	1	1	1	1
9	GATE HOLD ROOM:	m2	100	210	210	210	210	210
Arriving terminal								
1	ARRIVAL QUEUING AREA- PASSPORT CONTROL	m2	50	163	209	261	287	326
2	PASSPORT CONTROL –ARRIVAL	m2	4	6	8	10	11	12
3	BAGGAGE CLAIM AREA	m2	480	644	826	1,032	1,135	1,290
5	NUMBER OF BAGGAGE CLAIM DEVICES	pcs	2	2	2	3	3	3
6	QUEUING AREA- ARRIVAL CUSTOMS	pcs	30	45	57	72	79	90
7	ARRIVING CONCOURSE WAITING AREA (EXCLUDING CONCESSIONS)	pcs	100	644	826	1,032	1,135	1,290
8	ARRIVAL CUBS	pcs	30	41	52	65	72	82

Gross terminal area

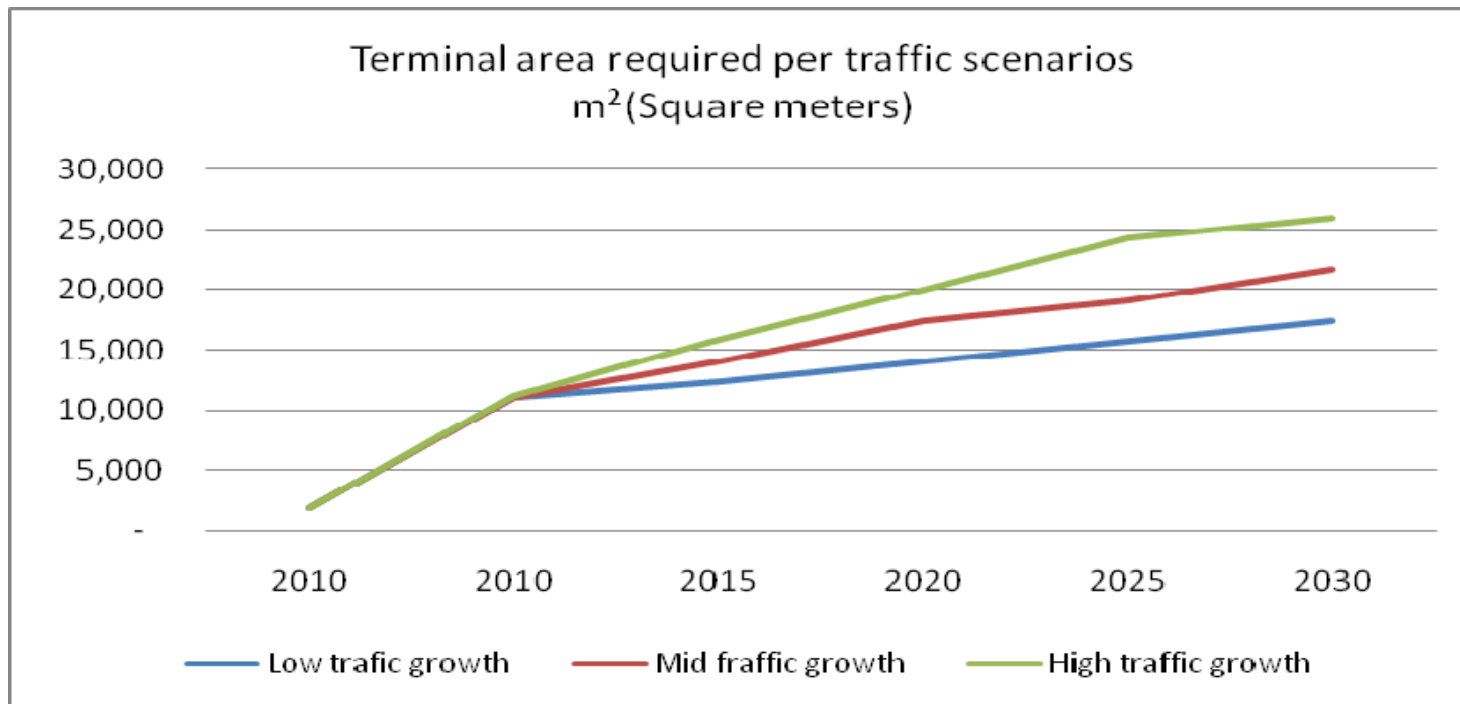
PIA planned Space required:	%
Commercial space	35%
Passengers processing	40%
Support space	25%
Other non usable	5%



GROSS TERMINAL AREA(m2)	2010 (actual)	2010	2015	2020	2025	2030
Low traffic scenarios	4,060	11,101	12,400	14,087	15,775	17,463
Mid traffic scenario	4,060	11,101	14,087	17,463	19,150	21,698
High traffic scenarios	4,060	11,101	15,775	20,010	24,229	25,917

Capacity calculations

Comparison of gross terminal area by scenarios:



The difference between low and high scenario is up to 50% of total area required

Financial Implications

- The total cost is determined by the square meter on total areas and selected areas of terminal
- Cost per building terminal varies greatly, average of 3,000 Euro per square meters is taken as reference

Investment Schedule (millions)	2015	2020	2025	2030	TOTAL
Low	37 €	5 €	5 €	5 €	52 €
Mid	42 €	10 €	5€	7 €	65 €
High	47 €	12 €	12	5 €	77 €

- The O&M cost per to terminal buildings is between 115\$ to 860\$ per square meter, of the gross terminal area annually

Conclusions

- Scenarios base forecast was necessary to consider the alternatives in air traffic growth.
- The planning process itself is based on the service quality measured in term of m² per passengers.
- Final gross terminal area is determine by the passenger processing areas, non-public support areas and commercial areas but local circumstances matters.
- Considering investment cost to expand terminal area and also the cost of O&M being linked to total area of the terminal, PIA develop strategies that balance the demand for air traffic and capacity expansions.

Recommendations

Primary:

- **Phasing expansion-** building of capacity is recommended to be done in 5 year period.
- **Systematic measurements of service level-** measuring the variables affecting the passengers service levels.
- **Stimulate spreading traffic on off peaks hours-** spreading traffic from peak hours to non peak hours

Recommendations

Secondary:

- **Use of high-tech technology** - The most promising advance is likely to be through information technology leading to machine readable passports, and self-ticketing at the gate or at home via the internet.
- **Adoptable structure of terminal**- This can be done by adding additional modular section to a main building or by reallocating of area within sections.
- **Future Research**- the survey based research on passengers will provide more in-depth information on passenger's expectations

Thank you for attending

Any questions?