The Infrastructure Challenge

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Good afternoon Ladies and Gentlemen.

We will speak to you today about one of aviation's most critical shortcomings: Airport Infrastructure.

I'm Hemant Mistry, the IATA Director for Airports & Fuel, and together with my colleague, David Stewart, Head of Airport Development, we will describe to you IATA's efforts to address growing concerns of our members on this vital issue for which there is significant scope for improvement.

Outline

↗ The Capacity Challenge

↗ Unwarranted CAPEX

↗ Identifying Capacity Bottlenecks

↗ Constructive Engagement

Today we will touch on four key areas that are in the forefront of our concerns:

1. The Capacity Challenge - how the current fragmented approach around the definition, planning and coordination of airport infrastructure really isn't fit for purpose

2. Unwarranted Capital Expenditure –cases of major infrastructure projects where the magnitude of the expenditure is not necessary to accommodate the foreseen growth of aviation

3. Identifying Capacity Bottlenecks –the need to anticipate where the next infrastructure crunches are going to be so we can engage early and influence necessary stakeholders (incl. airports, governments, local authorities)

1. And finally “Constructive Engagement” - a way for airlines and airports to engage in productive discussions to align strategic objectives and work together to jointly define functional needs and corresponding infrastructure requirements.

We all need a step change to work together to ensure functional and affordable capacity goes in at the right places where the airlines need most it.

Outline

- ↗ The Capacity Challenge
- ↗ Unwarranted CAPEX
- ↗ Identifying Capacity Bottlenecks
- ↗ Constructive Engagement

Firstly let me hand over to David who's going to talk to you on elements of Capacity Challenge, Unwarranted Capex and Identifying Capacity Bottlenecks.

Afternoon all, in my role as Head of Airport Development at IATA I oversee IATA's collaborative efforts with respect to the interface between the airline community and the owners and operators of major global airports.

Aviation capacity is of growing concern, the fragmented way of working between airport, authorities, governments and airlines cannot continue.

First I'd draw your attention to the issue of investment that does not fully deliver the necessary improvements.

A Capacity Crunch is looming

↗ Infrastructure lagging demand at key airports

↗ New projects with unrealistic timeframes

↗ Mega-airports as "trophy projects" for governments

Every region of the world is moving to address the ongoing "airport Infrastructure Challenge", but, unfortunately, not always in a coordinated way.

Many international airports are "full".

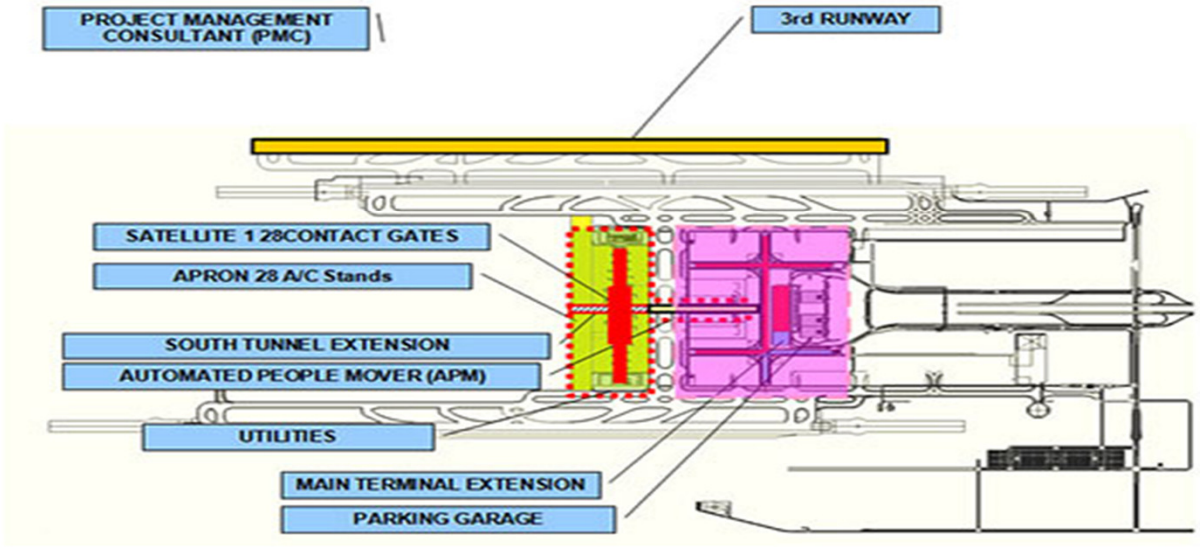
- Some airports are operating almost perpetually at full capacity.
- Some airports do have additional capacity, but not at the times when people want to fly and, in an industry focused on supply and demand, that creates bottlenecks in the system.
- Other airports have additional capacity that is inaccessible due to bureaucratic regulation and outdated processes.

While the propensity to travel has continued to grow, the building and updating of aviation infrastructure has tended to fall behind and in some cases, stagnate.

In the resulting flurry of activity to address the shortfalls in existing aviation infrastructure, governments and their concessionaires move forward rapidly. Unfortunately, a lack of coordination with airlines (the users of the facilities), is coupled with unrealistic timeframes.

Aviation infrastructure works are still viewed in many regions as "trophy projects" for national pride without considering the usefulness of the investment to airlines and their passengers.

Balanced Capacity Development



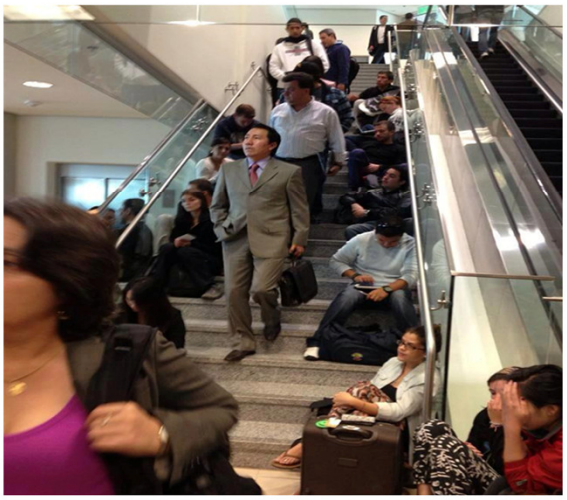
To touch on some of the issues:

All too often some airport investment projects only address one part of the capacity shortfall, moving the bottleneck down the line to the next pinch point. Additional capacity needs to be phased so that capacity is maintained and balanced across the whole airport campus.

The phased development plan for Bangkok looks at different elements like runways, terminal and parking stands both separately and together to ensure that they are mutually supportive.

There is no point in landing more aircraft on a new runway if there is no where to park these same aircraft at the air terminal. Similarly there is no point in building additional aircraft stands if the limit of the runway operation has been reached. Yet we see examples of this kind of misalignment happening in too many cases.

Lack of coordination is a concern
- Examples in the Americas



Quito Opening Day

Sao Paulo Terminal 3

The general overall lack of coordination with airline users is a concern and often a major problem: If we just take the case of the Americas:

Bogotá's new terminal has been built too small and is already at capacity

Quito's new airport terminal is smaller than the one that it replaced

Sao Paulo T3 has failed to address key operational bottlenecks that have been an issue at GRU for many years:

- Outbound immigration gridlock
- Long queues at transfer (major component of home based carrier operations)
- No improvement in overall transfer process / time

By forging ahead and minimizing the dialogue with the airline groups the concessionaire built a new terminal that did not take full advantage of all of the potential connectivity or fully optimize the transfer operation at this major hub airport.

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The second issue I want to draw your attention to is the case where investment is misdirected into unnecessary airport development projects.

In an industry where we often come up against a lack of investment, this is worrying and wasteful.

Again, it is a lack of coordination and consultation that is at the root. Money is being spent carelessly to address 'issues' that do not exist; or issues that can be mitigated using other means – operational improvements that include better coordination with stakeholders.

Unwarranted CAPEX - Europe

- **Rome**
  - US$ 4.5 Billion development program vs decreased flight activity
- **Athens**
  - New airport 2004 - one of the highest charges
- **Spain**
  - Ciudad Real Airport - €1.1b. Opened 2009, closed 2012. Total passengers in the period 100k
  - Castellon Airport - €200 m. Finished in 2011. Still no pax./flights

There is also the tendency to build big without it being driven by user demand:

Rome – Aeroporti di Roma plans to lift passenger terminal capacity to 55 Million passengers per annum by 2020. In 2013 Rome handled 36 Million passengers. However the existing runway system is already working at capacity. Therefore the only way to grow traffic is outside of the peak. This does not warrant investment in additional terminal capacity.

Athens new airport opened in advance of the 2004 Summer Olympic Games with traffic levels of approximately 12 Million passengers per annum. Traffic peaked at ATH in 2008 at 16 Million passengers. By 2013 this was back down to 12.5 Million passengers per annum. This drop can be easily attributed to the global financial crisis, but traffic recovery hasn't been aided by the fact that Athens, with its airport development charges, is one the most expensive airports to operate from.

In Spain there is more than one fairly recent example of an airport that opened, in one instance with assistance from EU funds, but with limited or no airline services and no passengers to serve:

Ciudad Real Airport

… is located 200 km from Madrid and has been built with the intention of being a secondary airport for the Madrid urban area. The facility cost €1.1 Billion and included a 4000 -meter runway. The airport opened in 2009 and subsequently closed only three years later in 2012. Over the course of the three years the airport handled only 100,000 passengers.

Castellon Airport

… is located north of Valencia and was built at a cost of €200 Million. Construction was completed and the airport declared open in 2011. The airport still has no passengers or flights.

Unwarranted CAPEX - Africa

↗ Second / replacement airports

Country / Airport	mppa		US$
Angola: Luanda (LAD)	2.40	New airport	400 m
Chad: N'Djamena (NDJ)	-	New airport	1.0 bn
Rwanda: Kigali (KGL)	0.46	New airport	700 m
Senegal: Dakar (DKR)	1.70	New airport	735 m
Sudan: Khartoum (KRT)	2.10	New airport	2.0 bn
Swaziland: Mbabane (MTS)	0.06	New airport	280 m
Namibia: Windhoek (WDH)	0.76	New airport	200-400 m

Other examples of unwarranted CAPEX spend are happening in Africa.

The chart highlights 7 examples of countries / airports in Africa that are in the process of constructing new or 2nd "international" airports. The quantum of CAPEX involved raised concerns considering current low levels of passenger traffic. Expenditure on this scale should be questioned.

There are many cases where airports and their overseeing regulators and governments have limited experience with expanding existing airport facilities, particularly within a live operational environment. So it often appears to be simpler to just build a whole new airport and than expand existing facilities.

Working together with airline Subject Matter Experts should be mandated by regulators to ensure that expenditures are necessary, functional and will provide a return on investment. Unfortunately this is not happening, resulting in unwarranted CAPEX expenditures that produce little actual benefit.

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- ↗ Constructive Engagement

To help IATA evaluate the need for investments in aviation infrastructure we have started to develop a database to identify pending shortfalls in capacity so we can anticipate where to focus our resources and best apply our expertise for the greatest benefit to our member airlines.

IATA Capacity Analysis Database

Region	IATA Code	Name	RUNWAYS			TERMINAL		
			Aircraft Movements	Growth Rate	Capacity limit reached	Passengers in Millions	Growth Rate	Capacity limit reached
Asia Pacific	CGK	Jakarta	398,985	4.9%	2021	60.1	4.1%	FULL
	HND	Tokyo Haneda	403,242	3.1%	2018	68.9	3.2%	2035
	BKK	Bangkok	301,747	-4.8%	2023	51.4	-3.1%	FULL
North Asia	PEK	Beijing	567,759	1.9%	2019	83.7	2.2%	FULL
	SHA	Shanghai	243,916	3.8%	2021	35.6	5.2%	2016
	HKG	Honk Kong	382,782	5.7%	2016	59.6	6.3%	FULL
Europe	AMS	Amsterdam	440,057	0.5%	2021	52.6	3.0%	2018
	IST	Istanbul	406,317	11.5%	2017	51.3	13.7%	2017
	LHR	London Heathrow	471,938	-0.7%	FULL	72.4	3.3%	2026
Latin America	BOG	Bogota	322,546	1.0%	2020	25.0	14.2%	FULL
	GRU	Sao Paulo	284,191	3.8%	2020	36.2	11.4%	2018
	MEX	Mexico	396,567	5.0%	2022	31.5	6.9%	2015
Middle East	DOH	Doha	205,744	7.7%	2026	23.4	9.8%	2018
	AUH	Abu Dhabi	135,213	11.2%	2023	16.5	12.4%	FULL
	DXB	Dubai	369,953	7.5%	2019	66.4	15.2%	2016
North America	YYZ	Toronto	431,323	-0.6%	2031	36.1	3.4%	2019
	EWR	Newark	419,850	1.4%	2018	35.0	2.9%	2031
	LGA	La Guardia	371,565	0.4%	2017	26.7	3.9%	2020

The airline community, like all other businesses, needs to make the most of the resources at hand (i.e. the scarce capital Brian Pearce highlighted in his presentation) and to ensure that these resources are focused on the most important opportunities.

In the case of airport infrastructure, where very large Capital sums are being spent to improve and increase capacity, the costs for which will eventually be recovered from airlines and passengers in terms of charges, are used to the greatest effect.

IATA is developing a predictive tool to ensure we focus efforts where there is the greatest need.

IATA's evolving Capacity Analysis Database is a means by which we hope to maximize alignment of CAPEX expenditure for major airport development programs.

We can see an excerpt of the Database showing a selection of major airports in different regions with their current throughput, the growth rate and the year when our model estimates the airport infrastructure, either terminals or runways, will reach full capacity. While this is work in progress, you can see there is a lot of "red" on the chart.

The need to work together to address the next capacity crunch

- **Airports with full Terminals**
  - 2014: 90 airports
  - 2020: 228 airports
  - 2030: 323 airports

- **Airports operating at 90% capacity of the Runways**
  - 2014: 6 airports
  - 2020: 63 airports
  - 2030: 125 airports

Understanding existing capacity issues can help to focus attention.

We can first see the number of airports operating at full capacity in the **TERMINALS** causing long queues, overcrowded facilities and bad levels of service.

In the case of the **RUNWAYS** we can see the number of airports operating at 90% of capacity. At 90% the airport is effectively full.

As you can see over the next 15 years we are predicting substantial increases in the number of airports facing either terminal or runway capacity issues.

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Building on from the capacity database and working with airports and governments to influence the right decisions, I'd like now to focus on constructive engagement – how we should align strategies to define the size and function of infrastructure development.

Ensuring the right level of coordination and sound decision making is in the best interests of all stakeholders.

Constructive Engagement is fundamental for any development program

- Ongoing positive collaboration between “Business Partners” – airlines and airports
- Capital spend directed effectively where needed
- Effective regulation is essential

A fundamental step in building a strong partnership is to align the business strategies of the airport owners/operators and the airline community.

The concept of Constructive Engagement encourages the ongoing dialogue between the airline community and the airport owner/operator. This ensures that investment is directed where it is most needed to address capacity shortfalls that are hampering operations or growth.

But constructive engagement is not rocket science - it should be fundamental to any major airport development program. It is fundamental in any business for partners to discuss and share their goals and objectives so why not for airport infrastructure?

Of course, such programs need to be used within a clear governance structure and that’s where effective regulation of airports is so important. Costs should be scrutinized and differences in usage/access to different facilities also need to be addressed. Also understanding the capital intensity of big build projects, aspects of financing should be agreed with airlines together with the resulting impact on charges.

Strong Partnerships

- Service level targets
- Cost Benefit Analysis for major investments
- Sustainable return on investment for airports and airlines

The need for partnership and meaningful consultation with key stakeholders is fundamental to the success of any major airport infrastructure projects. Establishing Levels of Service targets together with airline customers early during the development process acts as a development guide and also provides a means to measure the success of the project in addressing capacity shortfalls.

The development of cost benefit analysis (CBA) should be pursued to ensure major investment decisions are based on business principles – again this is rare in today's world.

The alignment of business strategies between the airport and airlines can then demonstrate sustainable return on investment for both parties.

Africa

↗ Airport Company of South Africa

- All stakeholders have opportunity to review & agree on future development options
- Regulating Committee provides valued oversight

To touch on some positives, there now some good examples where effective collaboration and engagement with the airline community is making a difference in the way airport facilities are being developed.

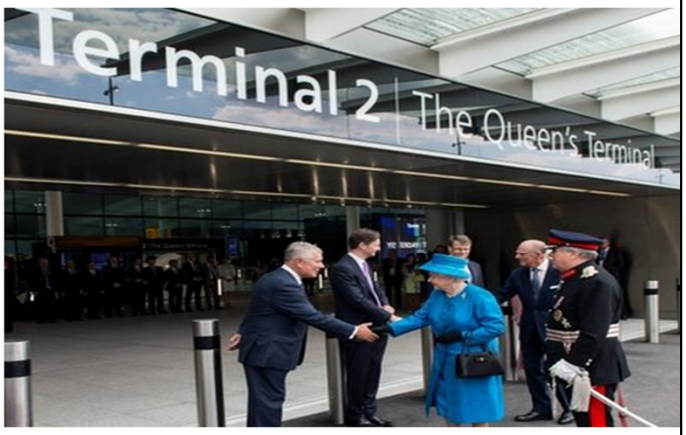
For example for airports in South Africa :

- It is true there have been differences between airlines and the airport in the past, particularly regarding issues in the 2010 CAPEX program
- Since then we have worked closely with ACSA (the operating company) to ensure master plans are in place – clear short to medium development plans are defined should anticipated demand / traffic materialize
- All stakeholders now have the opportunity to review reach consensus on future development options
- A Regulating Committee provides valued oversight.

Europe

↗ Heathrow Airport Ltd.

- 5-Year GBP 3 Billion CAPEX plan agreed with an associated saving in airport charges



↗ Schiphol Airport

- Transparent consultation and reduced charges

In Europe, IATA has worked closely with Heathrow Airport Limited and its 97 airline customers. Participation in the last 5-year CAPEX planning program has been challenging BUT very productive.

Thanks to the oversight of the regulatory body, an effective ongoing “constructive engagement” has led to an aligned GBP 3bn investment strategy that is endorsed and supported by the Heathrow airline community –97 airlines– including transparency on the impact on charges over the 5-year period of investment.

Amsterdam Airports Schiphol is also another example of a major airport where there customer engagement process has significantly improved. Once again, the airlines using the airport have transparent input on the design, operation and resulting cost base for the airport. And the airport has recently announced a 6% reduction in charges.

The Infrastructure Challenge by Region

ISSUES	North America	Latin America	Europe	Middle East	Africa	North Asia	Asia Pacific
Existing Capacity Challenge	🟡	🔴	🔴	🟢	🟢	🟡	🟡
Balanced Capacity Development	🟢	🟢	🔴	🟡	🟡	🟢	🟡
Unwarranted CAPEX	🟢	🔴	🟡	🟡	🔴	🟡	🟢
Forecast Capacity Shortfalls	🟡	🟡	🔴	🟢	🟢	🟢	🟡
Constructive Engagement	🟡	🟡	🟡	🔴	🔴	🟡	🟡

So ladies and gentlemen, we hope you agree that the infrastructure challenge is big.

Different regions have shortcomings in different parts of the overall process. Some are better at engagement than others. Some have yet to understand their capacity issues and the resulting Infrastructure needs. We must take the opportunity now to start to address these issues in a coordinated manner.

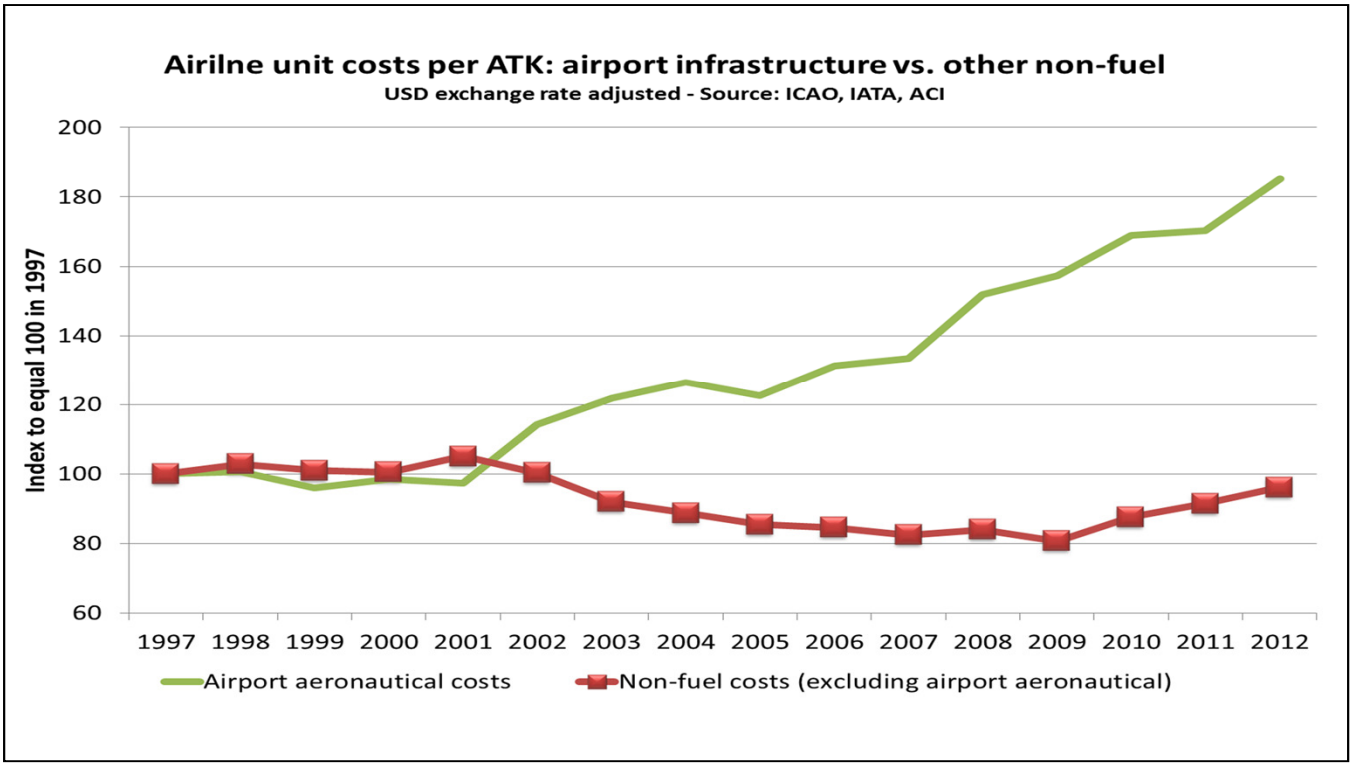
As can be seen from the chart here – we have a long way to go. This is 'our call to action'. The red lights in the chart define where there is the greatest need for improvement.

It is time airports, authorities work with airlines in a coordinated way.

We need to:

- Understand where capacity bottlenecks already are.
- Try to avoid unnecessary capital expenditure (which is not driven by user demand)
- Agree on proactive action needed to focus on the areas where investment is needed
- Together agree on the size, scope, and function of build through effective user consultation such as constructive engagement

We need to coordinate and plan ahead on essential airport capex to ensure sustainable industry growth.



The overall objective is, again, to make sure the scarce capital that the airlines have is used by airports more effectively to address the major infrastructure shortfalls.

This chart shows how airport infrastructure unit costs (in green) have continuingly increased since 2001. But we still have the major choke points and pending capacity constraints.

Compare this with airline unit costs (excluding fuel) (in red). Clearly this diversion on performance cannot continue.

Alignment of airport CAPEX is crucial if we are to ensure our industry has ongoing access to affordable infrastructure while creating sustainable traffic growth and that can only be for the benefit of all stakeholders.

We would now like to open up the floor for Questions …