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The airport of the future

A strategic workshop to coincide with Farnborough International Airshow

Helios, Farnborough | Monday 11 July 2016

Highlights from the workshop

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Exploring the future of airports in 2050 – Scenario planning workshop during Farnborough Airshow

Helios kicked-off its 2016 Farnborough Airshow Seminar Week with a highly interactive seminar, challenging our invited group of senior professionals to consider the case of 'airports in the 2050s' using scenario planning techniques. This format encouraged our guests to challenge themselves, and their usual way of thinking. So, although the air show outside suffered disruption from torrential rain, inside we were using the example set by mother nature to consider how airports of the future might respond to unpredicted and challenging natural, man-made and geo-political circumstances.

The day was led and facilitated by two very different, yet complementary, experts in the field: Mike Pearson, our Sales and Marketing Director, has spent much of his career advising on major airport developments around the world and Gill Ringland, CEO and Fellow of SAMI Consulting, is a renowned expert, trainer and best-selling author on scenario planning and strategy.

Scenario planning is a powerful methodology that does not focus on a single 'right' answer, which is almost certain never to emerge. Rather, it explores several alternative futures. It is all too easy to fall into the mind-set of expecting more of the same and then doing nothing about it. This exercise demonstrated how scenarios can help us to better develop and future-proof strategies, identify early indicators of change and provide focus for long-term planning.

In our case, we set three broad scenarios with differing political models, global responses to new technology and even the hypothetical re-emergence of powerful city-states, all to explore how airports might evolve in the future.

As you might imagine, we enjoyed thoughtful, robust and wide ranging interaction and interventions from all of our guests, who contributed fascinating observations to enrich each scenario. Here are just a few of the interesting threads from the day which resulted from consideration of how airports might evolve in different global scenarios:

- The key to **unlocking additional capacity** in Europe is as much about a strong transport strategy with clear political backing, as it is about technology advances and physical infrastructure.
- Continued developments in aircraft and ATM technology help to unlock **new traffic patterns and flows**, affecting airline models, passenger experience and opening up new opportunities for secondary airports.
- **Regional airports** may face the threat of less government funding as political priorities shift and private investment in airports increases…'uberisation' of transport, reductions in staff, increased virtualisation, charters and co-location with technological and industrial partners are all potential ways they can respond to make their business more viable.

A successful business model today will not necessarily be as effective in the future, as the competitive landscape and business environment changes. Bringing in an external perspective can prove particularly useful when applying scenario planning techniques and allow the group to expand its thinking and understand the drivers of change.

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The challenge of long-term planning for airports

Air transport has been a key component in the globalisation of the world, with airlines embarking and disembarking a rapidly growing volume of passengers and cargo and transporting them across continents. Air transport has been both, enabler and consequence, of the ever-growing integration of national economies and of populations. At the same time has it been affected by volatile and periodically high fuel price levels and it is to blame for significant externalities such as greenhouse gases, air pollution and noise.

It is difficult to predict what long-term visions and challenges air transport will be facing. Different scenarios might be observed in demand for passenger and cargo transport, safety and security; airport and navigation infrastructure; and in the provision of supply by the agents in the air transport value chain.

All those factors will influence the future of European airports and change their conception. Airports will have to improve performance, enhance operations and strengthen their role in the network in order to satisfy their passenger and airline customers.

By applying scenario planning techniques, we can:

i. **Develop new strategies** – there are two main approaches to using scenarios as part of formal strategic planning – aligning the strategy to a favoured scenario, or aligning the strategy to common elements in all the scenarios;

ii. **Assess existing strategies** – by placing your existing strategy in each scenario in turn and asking 'how would my strategy turn out if this scenario is the one that evolves, and how would it need to change?' you can assess the robustness of your strategy;

iii. **Identify potential early indicators of change** - enabling business strategy to more effectively pre-empt changes within the industry or wider environment, and to alert an organisation if it needs to take action;

iv. **Provide a long term planning focus** – considering the people and facility implications of each scenario, and how these can be planned for;

v. **Avoid complacency** – the future is inherently uncertain and strategy needs to be robust for a number of possible outcomes

The workshop considered three scenarios to 2050, which are outlined on the following pages. The scenarios are based on those developed by SAMI Consulting.

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Scenario 1: Second Hand

Macro-scenario

This scenario describes a world in which democracy is still valued, western values and institutions are still part of the global business environment and capitalism is still the dominant paradigm. Today's nation states still matter, though with weaker powers than today. Regional structures will set currency, defense, border controls, policy, regulation and mobility rules, including regulation affecting aviation. Raising capital will depend on regional standards and nations will be increasingly desperate to attract funds to pay pensions and invest in infrastructure.

The global population will grow to nine billion by 2050 and much economic power will shift to parts of Asia, Africa and Latin America where there will be a huge new middle-class. Ecological, energy and environmental limits will be tested or breached as the population increases, most people live in cities and the new middle class eats meat, uses cars, refrigerators and electronic goods and travel for pleasure. Technology (info, cogno, bio, nano) will continue to introduce changes in personal capacity and lifestyles, while ICT will underpin much of society as well as commerce and other aspects of life.

Impact on aviation

Global air passenger volumes will have increased to 12 billion. Government funding for airports is limited. Border control and cyber security are a major concern and important cost driver for airports. As a result, oil prices are high and volatile. The aviation industry has failed to deliver on its goal to significantly reduce CO_2 emissions by 2050, while government imposes high taxation on airports and airlines.

Aviation technology has developed evolutionarily, with aircraft and propulsion largely relying on the same technologies as at the turn of the century, and in particular on hydro-carbons. Only recently, electric propulsion started to play a greater role in regional aviation. Airline business models are not clear-cut, as global airline groups have hybridised

their offering to best adapt to their markets. Geography continues to have a major impact on airline business models: huge hub carriers thrive in the Middle East; Europe and the Americas work well for very big but more decentralized carriers.

Airport technology has allowed leading airports to coordinate the activities among airport, ground handlers, airlines, commerce, ATC and amongst each other. This has allowed for huge improvements in processes and leveraged retail.

How can airports prepare themselves for the future?

- Flexible organisation, allowing to adjust structurally to changes in traffic, airline business models and consumer preferences. This flexibility needs to be built into the design of an airport from the beginning, for it to be used over many decades.

- Become leaner in an effort to overcome cost structures that are not supported by revenues.

- Cost discipline becomes more critical as public funding will often be replaced by private finance. This also represents a chance towards conducting a more thoughtful airport development.

- Exploit technology to maximise operational efficiency, for a better customer experience and cost savings.

- Maximise ancillary revenues on the basis of a more direct customer relationship. This can be enabled by technology and by occupying parts of the value chain left void as airline business models evolve towards no-frills or unbundled service offerings.

- Improve sustainability and manage externalities more effectively. Airports and government need to take a more holistic and more coordinated approach in developing airport infrastructure.

- Anticipate the operational impacts of climate change on airports, including from precipitation, temperature and prevalent winds.

Scenario 2: Globalisation

The world evolved after the financial and fiscal crises followed by a complete meltdown in many western countries. State budgets will have become overloaded, causing a retrenchment in state expenditure, consumer spending power and overall consumption. Western societies will have suffered from social shifts, leaving parts of society worse off, but benefitting others. Ecological, energy and environmental limits will be tested or breached as the population and middle classed increases.

The world as a whole is more educated and well-fed. New global governanc**e** mechanisms will arise, based around a loose network of affiliate groups with differing organising principles but a common need to tackle global concerns – ecological, environmental or related to energy.

Impact on aviation

On the basis of growth of GDP and the middle-classes in most parts of the world, global air passenger volumes will have increased to 16 billion.

By 2050, regional government structures will set regulation and mobility rules within an international consensus – this applies also to aviation regulation, with ICAO becoming ever more important and helping the industry to consolidate internationally.

In many countries infrastructure and airport investment had been severely neglected by governments. Airports are, however, benefitting from private investment boosts which began in the 2040s – completely new ideas to create the airports for the 22nd century are being pursued.

Aviation technology has made a significant leap in the 2030s, allowing for decreased dependency on traditional jet fuel and significant improvement in performance, i.e. electric regional aircraft, first civilian hypersonic aircraft to be rolled out in the late 2050. The climate impact of the aviation industry is about to drop dramatically. Fuel, either traditional jet fuel, battery-stored electricity or solid hydrogen represents a share of twenty to thirty percent of direct operating cost of airlines.

Together with the economic boom in the 2050s this could become another golden age for aviation.

Airline business models are not clear-cut, as global airline groups have hybridised their offering in order to best adapt to the respective local markets and customer segments. The significant shifts in society and regional powers has changed the landscape in the airline industry completely, with only few top brands from the 2010s around.

How can airports prepare themselves for the future?

- Maximise capacity in every aspect of airport operation: ATC, usage of runway, taxiways and apron, terminals, access areas. Technological advances in all areas need to be exploited.

- In order to set free capacity, airports and government need to take a more holistic and coordinated approach in developing airport infrastructure, including a coordinated development of primary and secondary airports.

- Airports need to be integrated with other modes of transport, in particular high-speed rail. This also increases catchment areas and allows for a more efficient use of airport infrastructure across regions and countries.

- Secondary airports need to embrace business opportunities enabled by aircraft and ATM technology, integration into regional value-chains outside of the perimeter, RPAS and others.

- Private ownership and investment is key to finance the necessary development of airports.

- Industry fragmentation needs to be overcome, local interests need to be subordinated, in order to confront political, financial and environmental challenges.

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Scenario 3: City societies

The world of the City Societies scenario is one which has declared globalisation to have failed, democracy to be too unwieldy and western value systems to be inadequate. The concept of the nation state as provider has disappeared.

In its place, a multitude of city states have emerged, in some cases replacing completely a failed state, in others co-existing (occasionally awkwardly) with a state whose role and authority are often substantially reduced. City states will represent fortresses where individuals seek protection and order. It will be very much an 80/20 world where inequality is high, both within and amongst cities. Three quarters of the world's biggest city states will be in Asia and Africa. Mobility across states and between cities is the norm.

The global population will have fallen by a billion people in the 2030's due to food scarcity, epidemics and wars, although the world will appear by 2050 once more to be on a growth path.

Impact on aviation

Global air passenger volumes have grown to 6 billion, significantly lower than what was expected at the beginning of the century (but still about twice as much as in 2015).

Some city states which positioned themselves as transport hubs at the turn of the century have evolved into leading business hubs and cultural centres in their own right. The transport hubs are a critical part of their infrastructure and city state connectivity. Leading city states are progressive and innovative in their airport planning and infrastructure development. At the same time, secondary airports try to cope with scarcity of resources and to reinvent their business models.

Aviation technology has developed evolutionary, with aircraft and propulsion largely relying on the same technologies as at the turn of the century, and in particular on hydro-carbons. Only recently, electric propulsion started to play a greater role in regional aviation.

Taxes and environmental charges weight heavy on airports and airlines are high, but most governments are aware how critical aviation is for their economies.

Airline business models are not clear-cut, as global airline groups have hybridised their offering in order to adapt to the respective local markets and customer segments.

How can airports prepare themselves for the future?

- Airports will be affected by this scenario in very different ways, depending on the social and economic situation of their respective city states: Some airports will have the means to embrace the latest technology, for example to cope with capacity, security or environmental challenges. Other airports with limited financial means will have to deal with these challenges in a rather precarious way.

- Airports need to invest into capacity and security enhancing technology, related to access, terminal, apron, runways and airspace.

- Collaboration between city states is critical in order to address airspace constraints and security issues.

- The approach to airspace management needs to be re-thought, potentially leading to optimised traffic flow management along with capacity and safe routes, rather than necessarily the use of the shortest route.

- Airport slots can be auctioned to maximise the public benefit of limited air traffic capacity.

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The day was led by Mike Pearson, a Helios Director who has spent much of his career advising on major airport developments around the world. His extensive commercial consultancy experience covers notable masterplanning commissions, such as Oslo-Gardermoen, Durban King Shaka and Frankfurt T3 and, more recently, he led the Mayor of London's detailed investigations into a new airport for London. He has advised on matters of air transport capacity and infrastructure deficits in the United Kingdom and has been active in debates on major hub developments around the world, including Dubai's future transition to DWC and the planning of major new hub airports in Jeddah and Qingdao.

The facilitator for the day was Gill Ringland, well known as an author, consultant and trainer on scenario planning and strategy. Since 2002 Gill has been CEO and Fellow of SAMI Consulting which specialises in working with organisations to improve decision making and implementation, based on views of the future. She is a world-recognised scenario thinker, through the books which are amazon.com best sellers (which include "Scenario planning" and "Scenarios in Public Policy" and "Beyond Crisis").

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