



Editorial

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Some related useful links are posted on www.wbp.aero

Your comments/suggestions are welcome < aci@aci.aero >

A special thanks to the Editorial Committee members for their time and efforts to launch this newsletter, without whose professional expertise AVIATION DIALOGUE would not have been possible.

To find more about the ACI WBP Programme – click on the icon



The World Business Partners Board is pleased to offer ACI Members this inaugural edition of **Aviation Dialogue**. This publication is consistent with our Mission:

“ . . . to serve as a resource for businesses and individuals who provide the products and services to commercial aviation and to provide a mechanism whereby industry can assist the airports of the world in meeting their objectives.”

In this spirit, we have chosen two important themes for our first edition: **Sustainability and Increasing Non Aeronautical Revenue**. Upon first glance it might be difficult to see a link between the topics. However, we believe that in order for an airport to meet their needs of the present without compromising their needs of the future (sustainability), airports must look beyond traditional aeronautical revenues, especially during the current economic times with the decline in global passenger traffic and aircraft movements.

There is little doubt that our WBP members, like airports, are grappling with economic turbulence as a top priority. Having acknowledged this, the way in which our industry chooses to respond to climate change and sustainability could have an even more profound impact on our long-term future and prosperity. It is important for airports to be aware of alternative revenue sources and ways to fund sustainable, future growth activities through new technology and expanded use of current systems; expertise and ideas the WBPs have shared in this edition's articles.

Sustainability is a mainstream issue: estimates vary but the general consensus is that the Aviation industry is responsible for 2% to 4% of global carbon emissions, which is a relatively minor but certainly not a negligible contribution. IATA has published their “2050 Challenge” to their membership to reduce carbon emissions. The US Conference of Mayors has endorsed the “2030 Challenge” which sets similar goals. Many trade organizations, such as the American Institute of Architects and the Royal Architectural Institute of Canada, are similarly challenging their constituents. The Aviation industry is lagging behind other industries such as Healthcare and Education, many of whom have embraced Sustainability methodologies such as LEED, brought out in a number of the articles included in this edition. The WBP Board encourages ACI Members to take a position on this matter, to avoid possible public perception that Aviation is a “dirty” industry, unresponsive to environmental concerns.

The WBP members are acknowledged world-leaders in their businesses. This inaugural edition of **Aviation Dialogue** presents editorial case studies from WBP members who have responded in innovative ways to the Sustainability and Increasing Non Aeronautical Revenue challenge. We hope that you will find the information helpful to keep your own business growing and expanding while being mindful of the impact our industry has on the environment. We welcome your responses to this issue, and encourage you to send us contributions to future editions.

Sincerely,

Catherine Mayer
Chairman of the ACI World Business Partner Board

SUSTAINABILITY

Airports Sustainable Development: Principals and Key Issues

By Dr Callum Thomas, CATE, Manchester Metropolitan University, Dr Dimitrios Dimitriou, CATE/MMU, Cranfield University, Dr Kostas Iatro, Air Transport News

The concept of sustainable development

In principal, the term sustainability mainly referred to the maintenance of important environmental functions for present and future generations. Therefore, the concept of sustainable development could be considered by a variety of different perspectives, by governments, industry, academics, institutions and NGO's alike. These different views and needs may lead to conflicts between the stakeholders involved in decision process providing a significant threat of the business development.

Most of the nations recognise the importance of mobility to the social and economic development. In Europe, all states encourage the application of the sustainable development as a mean of the integration and realisation of the European Community. The European Union is committed to the integration of sustainable development into all its policies and accordingly in developing its Common Transport Policy the following principles have been recognised:

- acceptance of the philosophy of a basic freedom to travel;
- the continuing growth of the transport industry;
- the need for a comprehensive transport system;
- the key role that aviation would play in such a system; but also,
- the environmental impact of different modes of transport; and
- the need to make use of the appropriate mode for the task required.

The key principle underlying sustainable development is recognition that there are limits to growth or the environmental implications of growth. The application of the concept of sustainable development to the airport industry has been considered by ACI with again, a variety of different definitions and understanding of what the term means. However, it is a general and benign aspiration to which all can commit, namely the integration of environmental, social and economic concerns. These concerns may not be mutually supporting and their integration may involve contentious trade-offs. In Europe, the most of the states acknowledge that aviation has implications at a global, national/regional and local level for all four aspects of sustainable development as defined in its sustainable development strategy namely in terms of :

- *The maintenance of high and stable levels of economic growth and employment;*
- *Social progress which recognizes the needs of everyone;*
- *Effective protection of the environment; and*
- *The prudent use of natural resources.*

Environmental management: key issue of airport sustainable development

At a global level the issue of climate change provides a good illustration of the challenge faced by regulators. It is noteworthy that the commitments given by the EU at Kyoto require that Green House Gas (GHG) emissions across Europe be reduced by approximately 8% over a period of 15-20 years. However, it is known that Government's could not impose an 'across the board' target reduction as this would cause significant economic impacts in local, regional and global scale. Rather it will seek to find emissions 'savings' in the least 'costly' way possible following an analysis of the potential of different sectors to achieve reductions and the social and economic consequences of doing so.

At a local level, the adverse environmental and community impacts of aviation can lead to restrictions on existing airport operations and constraints upon future growth. Every airport differs in terms of the environment in which it is set, the sensitivity of surrounding countryside and proximity to built up areas.



se factors coupled with its need for further infrastructure provision (particularly for increasing the surface accessibility of airports), the level of air traffic operations and their timing will all determine how important such issues will be in terms of future growth.

Therefore, effectively airport planning and management deals with policies and tools to keep the balance between the benefits and the costs of the services provided by air transport in respect of the specific needs of global society. Effective environmental management can help reduce the potential of environmental issues to emerge as capacity constraints and can therefore facilitate growth. However it's clear that even with the most effective environmental management system and new technologies onto the aircraft fleet, meeting the anticipated growth in air transport will still have significant environmental consequences for many airports.

Key challenges for the airport industry

Aviation is excluded from the Kyoto protocol, mainly, because Government's could not ignore the significant increase in GHG emissions from the air transport industry that will occur as a result of meeting demand in the future. In this situation it is understood that business scenarios based on 'business as usual' development would not be deemed a politically acceptable approach to addressing the issue of climate change. Therefore, the airport industry must show that it is making a special effort to address this challenge.

Airport authorities and operators have to envisage a more sustainable air transport industry. New, and in some cases, very different operational practices are being researched and developed by every sector of the industry; airports, airlines and air traffic service providers. Here too considerable opportunities exist for exploitation such as the potential for reducing GHG emissions by restructuring the air traffic management system to deliver more direct routing and minimise air traffic at airports or changing altitude for the cruise level of flight to reduce the damage caused to the upper atmosphere by engine emissions.

In addition, the development of an integrated transport network exploiting and maximising the capacity and use of existing infrastructure. Having developed a suitable transport infrastructure, however it is then necessary to develop the services and systems which:

- minimise the need for people to use the private car to access airports;
- make travel and carriage of goods by the appropriate mode of transports; and
- educate the consumers to modify their travel experience in the interest of sustainable development.

In short term, changes of the aviation operation and business structure will be extremely difficult to achieve, it will need to take account of the international regulatory, commercial and operational system within which the air transport industry operates. It will have to be achieved in such a way that the transport industry can continue to provide the services required to support the needs of a healthy and developing economy and society. The more successful the industry's efforts are to reduce its environmental impacts, the greater the potential for growth and less the likelihood that demand management would be considered to be necessary by regulators.

By Dr Callum Thomas, Professor, www.cate.mmu.ac.uk, www.mmu.ac.uk, Dr Dimitrios Dimitriou, Fellow, www.cate.mmu.ac.uk, www.mmu.ac.uk, www.cranfield.ac.uk, Dr Kostas Iatrou, Managing Director, www.airtransportnews.aero

Sustainable Building Practices Enhance Delivery and Performance of Aviation Projects

By Shannon Eckart, Public Relations Manager_ Turner Construction

Rising environmental consciousness has led to an increase in sustainable practices across all industries including the aviation industry. Construction is central to discussions of sustainability as green buildings—



buildings that are efficient in their use of energy, water and other resources, and are designed to create improved environments for occupants—have lower energy costs, operating costs and lifecycle costs.

To measure the perception of the performance and benefits of green buildings, Turner Construction Company has conducted three surveys of real estate executives since 2004. The survey results have confirmed that there is a broad consensus among the participants that Green buildings enjoy lower operating costs and improved financial performance.

In the most recent 2008 survey, the majority of executives viewed Green buildings as generating benefits to their owners and tenants. Roughly three-quarters of survey respondents said that they believed that the initial perceived cost premium of building Green would be paid back through lower operating costs. Green buildings were considered to be less expensive than non-Green buildings for several key measures of cost. Executives said that Green buildings enjoy lower costs than non-Green buildings in the following areas:

- Lower energy costs (84%)
- Lower overall operating costs (68%)
- Lower total lifecycle costs over a 10-year span (59%)

Given the demonstrated environmental and economic advantages of green buildings, we are seeing a continued increase in green construction. The American Recovery and Reinvestment Act funding of green building projects will serve to further stimulate investment in green building projects.

Airports as well as construction companies have their own part to play in sustainability. For instance online systems for tracking construction waste eliminate the need for the use of paper in the reporting and billing of waste removal on construction sites.

The Jet Blue Terminal 5 project at John F. Kennedy airport, Airport, Jamaica, New York, is a 640,000 sq. ft., 26-gate terminal that incorporated the landmark TWA terminal. The site for the 26-gate terminal was covered with a 12 to 17 inch thick concrete tarmac. Among the strategies employed to divert construction waste on the project was crushing and recycling the concrete tarmac to make it available as a suitable subgrade fill material for use by the foundation, concrete slab-on-grade and utility contractors. This recycled material accounted for 95 percent of the subgrade fill needed for the new terminal.

The graphics of a BIM are founded on a database containing attribute information for model elements. Individual components in total make up building assemblies such as structural steel, concrete, mechanical, electrical, plumbing and fire protection. When modeled in BIM software the graphics can be embedded with information, including cost, schedule and assembly characteristics such as fire rating. So, for instance, a BIM of a beam in structural steel can be linked to a database of attribute information containing the size, the type of steel, the cost and the status of its fabrication.

Among the projects benefiting from the utilization of BIM is the Sacramento International Airport Terminal Modernization Program – Airside Concourse project.



I-Room from Turner

The 300,000 sq. ft. Central Terminal B Airside Concourse will consist of a 19-gate passenger concourse with an international arrivals facility.

This project uses an application called Virtual Trade Coordination which involves providing trade subcontractors with architectural and structural design models. The trade contractors then provide the contractor with “shop models,” which are coordinated, using proprietary process to detect clashes and conflicts. Turner’s automated clash detection software tools enable us to review the BIM models and

identify and resolve spatial clashes and conflicts between building elements of the different disciplines on the computer when they were easy to resolve with the entire team in the same room.

By implementing BIM, clients are benefiting from a significant reduction in RFI's, reduction in field initiated change orders, an accelerated order and fabrication process, resulting in lead time reduction, an increase in the quality of finished work, lower costs and safer projects.

In addition to implementing BIM, the Sacramento International Airport Terminal Modernization Program will seek LEED Certification by the United States Green Building Council upon completion in 2012. LEED is a certification system that measures how a building performs with regards to energy savings, water and material use efficiency, CO2 emissions and indoor environmental quality.

We continue to see an increased interest among aviation clients in pursuing LEED certification for their projects and in implementing additional green building strategies such as construction waste recycling and BIM. Our experience demonstrates that depending on the level of LEED being sought and green strategies implemented in the construction process, Green buildings can be constructed with little or no first cost premium with benefits that continue throughout the life-cycle of an airport.

By Shannon Eckart, Public Relations Manager, www.turner.com

Three Steps to Carbon Neutral Airport Facilities

By Nellie Reid, Director of Sustainable Design _ Gensler

We see it all over the news - the aviation industry is getting a bad rap in terms of the carbon emissions associated with air travel. The industry is experimenting with biofuels, has increased fuel efficiency, streamlined flight routes, and even reduced travel speeds.

However, air travel is only responsible for **2%** of global CO₂ emissions (much less than that of road travel).¹ Buildings in the United States are accountable for **48%** of CO₂ emissions in the U.S.² There is a huge opportunity to focus on reducing CO₂ emissions associated with buildings.

Embodied vs. Operational Carbon Footprint

There are two major components to a facility's total carbon footprint: embodied and operational. Embodied carbon footprint is the impact of the extraction, harvest, manufacture, transportation and installation of the materials in a building as well as the disposal, recycle or reuse of those materials at the end of their useful life. The operational carbon footprint of a facility is associated with the ongoing operations and maintenance of the facility. Below, I've outlined three major steps in reducing (and ultimately neutralizing) the operational carbon footprint.

1. Reduce the Amount of Energy Used

The largest opportunity to maximize energy efficiency in a building is to properly address its orientation. Long facades should ideally face north and south. However at airports, building orientation is often pre-determined by runway placement and other site constraints. Designing the building envelope to respond to the given solar orientation is critical. Using daylight sensors or timers to dim or turn off lights in day lit areas during daylight hours reduces energy associated with artificial lighting. Occupancy sensors allow lights to be turned off when spaces are not in use. This is especially effective in restrooms, storage areas and hold rooms where occupancy fluctuates.

Reducing the amount of space that needs to be air-conditioned can have a huge impact as well. Natural ventilation is not always practical when you've got acoustic and air quality issues and in cold climates, it may not be practical from a thermal comfort standpoint. However, natural ventilation is successful in some of the smaller, regional airports in hot and temperate climates. The Palm Springs Airport has an open air concourse and the newly opened terminal at Palomar Airport in Carlsbad, CA has operable windows.





The new North Concourse of the San Jose International Airport, displacement ventilation is a more efficient HVAC system than the traditional overhead system, as it delivers air at a lower velocity and higher temperature directly to the occupied zone. It's important to look at the big picture of energy infrastructure.

- The North Concourse at the Norman Y. Mineta San Jose International Airport is naturally daylight and uses displacement ventilation. Gensler

Only so much can be done to improve the efficiency within a specific building if it is connected to an existing central plant. Since many central utility plants at airports were built several decades ago, they are ripe for upgrade or replacement with cleaner, more efficient equipment and technologies, such as thermal energy storage, combined heat and power, microturbines and ground source heat pumps.

Funding Upgrades to Existing Facilities

One of the hurdles to implementing energy efficiency upgrades is the lack of capital funding. One way to overcome this is to engage an Energy Service Company (ESCO). Under an Energy Savings Performance Contract, an ESCO pays all costs involved in identifying, installing, operating and maintaining new or upgraded energy-efficient equipment. The ESCO receives a share of the cost savings resulting from these improvements over a set term. At the end of the Energy Savings Performance Contract, the customer owns all of the improvements and receives all of the continuing savings.

2. Use On-site Clean, Renewable Energy

After energy reduction measures have been identified, then it's time to consider on-site renewable power generation. Since renewable energy technologies such as wind turbines and photovoltaics (PV) still tend to have a relatively high first cost and a long payback period, considering third party financing is a viable option. A power purchase agreement (PPA) is a contract between a power provider and a building owner. The PPA provider funds the project, designs, builds, owns, operates and maintains the system and sells the power back to the building owner. The building owner then has an option to purchase the system from the provider. This is a great way to avoid upfront costs yet reap the benefits of a reduced carbon footprint.

3. Purchase Offsets

Once you've optimized the energy performance of your facility and optimized the output of on-site renewable energy systems, you can offset the remainder of your facility's carbon footprint through the purchase of carbon offsets. One form of offset is renewable energy credits (RECs). The more energy you save through efficient design and operations and the more energy you produce onsite through renewables, the fewer offsets you will need to purchase to reach carbon neutrality. Therefore, it is very important that these three steps be taken in sequence.

Track Performance

It is important to track actual performance to prove that the measures are yielding the desired results. The U.S. Environmental Protection Agency's ENERGY STAR rating evaluates a building's annual energy use against the average for that building type in that region. The U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system evaluates a project in five major categories: site, water, energy, materials and indoor environmental quality.



There are other green building rating systems such as Building Research Establishment Environmental Assessment Method (BREEAM) in the UK, Comprehensive Assessment System for Built Environment Efficiency (CASBEE) in Japan and Green Star in Australia.

The Bright Side

Several airports are already incorporating energy efficiency measures and emissions reduction strategies. This is nothing new; it just has a stronger focus now when there are three big issues at hand: reducing operating costs, reducing carbon footprint and competitive advantage. Let's take advantage of these drivers and make some significant changes in an industry where there is a huge opportunity for improvement.

Endnotes

¹ Ethical Corporation website. "Aviation – The Need for Green Sky Thinking." [/www.ethicalcorp.com/content.asp?ContentID=6361](http://www.ethicalcorp.com/content.asp?ContentID=6361)

² U.S. Green Building Council.

By Nellie Reid, Director of Sustainable Design, www.gensler.com

A sustainable renovation: Tom Bradley International Terminal at LAX

By Gordon Phillip, Vice President and Director _Leo A Daly

With little more than one year left in its \$723.5 million renovation (which includes \$140 million for new inline baggage screening systems), the Tom Bradley International Terminal (TBIT) at LAX is poised to become a leader in aviation sustainable design.

The renovations and new construction at TBIT are being completed in order to maintain the terminal's prominence as the West Coast's international gateway. TBIT welcomes more than 10 million visitors annually, 16% of LAX's total passenger volume.

When Leadership Energy and Environmental Design (LEED) certified, the renovations at Tom Bradley will place LAX at the forefront of sustainable design, including significant "firsts" and scale milestones:

- It will become one of the largest (construction cost) projects in the U.S. seeking or already holding LEED certification.
- It will become the first renovated airport terminal in the nation to receive LEED certification.
- It will become the first Los Angeles World Airports (LAWA is the umbrella agency which oversees the city's four airports) renovation project to seek LEED certification.
- It is the largest individual construction project in the city of Los Angeles' history.

LAWA has registered the TBIT project with the U.S. Green Building Council (USGBC) for LEED certification at the Certified level under LEED-NC (New Construction) standards although the team is aiming to secure sufficient credits to attain Silver level LEED. Per a sustainable building policy adopted by the city in 2007, all future LAWA construction will feature LEED standards.

TBIT's sustainable building design and construction program follows the six categories set forth in the USGBC's LEED standards. Those include:

Materials and Resource Conservation

- Reusing 100% of the existing building structure and shell
- Recycling or salvaging 75% of all construction and demolition waste thereby diverting it from local landfills
- Sourcing 20% of the building materials regionally



- Using sustainable or recycled (the minimum being 70%) content materials including: 70% recycled metal ceilings; terrazzo floors containing 80% recycled material; carpet tile with low volatile organic (VOC) adhesive and recycled backing; casework substrate using 100% recycled MDF; the use of fly ash in concrete; and installing high performance, low-e insulated glass in the terminal's two new buildings

Energy and Atmosphere

- Replacing existing light fixtures with high efficiency T8 fluorescent ones with dimmable ballasts on photocells (which will provide a 32% energy savings)
- Updating TBIT's 24-year old HVAC system with a FMS control system and high efficiency HVAC motors, including 19 roof-mounted air handling units
- Using certified green power from the Los Angeles Department of Water and Power (LADWP). LAX is the largest purchaser of green power from LADWP and plans to have up to 70% of its electrical needs supplied by that source
- Replacing existing tube monitors with energy efficient LCD information screens
- Pursuing the use of photovoltaic array solar panels to generate electricity (the array may generate 20% of the building's yearly usage)
- Installing new high efficiency motors in existing elevators and adding an idle low energy mode to existing escalators

Water Efficiency

- Installing drought tolerant landscaping and a drip irrigation system
- Installing electronic sensor faucets to conserve water
- Installing low-flow toilet fixtures: .5GPM lavatory fixtures, .5GPF urinals and 1.6GPF WCs
- All together, it is estimated that TBIT will conserve nearly 5 million gallons of water annually through these efforts

Sustainable Site Development

- Changing the existing landscaping to native plants
- Adding increased levels of filtration for storm water
- Using LAX's existing large fleet of alternative fuel vehicles. The airport has a hydrogen fueling facility on site and features preferred parking for carpools and electric or alternative fuel vehicles

Indoor Environmental Quality

- Utilizing low VOC materials for all paints, adhesives, sealant and carpets
- Implementing a comprehensive Indoor Air Quality management plan to monitor and control air quality

Innovation and Design Process

- Implementing an extensive transit management plan
- Featuring green educational displays in the terminal's arrival corridor which educate visitors on
- LAX's sustainable practices while encouraging consumers to adopt their own green practices
- Increasing the facility's use of certified green power to up to 100% of total usage

It is estimated that the TBIT renovation will achieve at least 31 points (26 are required to earn LEED certification). The TBIT design, engineering and construction team includes over 15 LEED accredited professionals and the number has been increasing throughout the life of the project.

When completed in the first quarter of 2010, the project will include 462,000 sq. ft. of renovations and 45,000 sq. ft. of new space. Construction began in February 2007 with a 38-month schedule which includes 30 phases and 12 milestones. All milestones have been met and the project continues to be on schedule and on budget.

Importantly, during renovation and construction, the terminal has remained operational 24/7. The integrated TBIT team worked to develop a conceptual phasing plan which allows up to 465 trades people to work in two shifts in multiple locations at the terminal.



To enhance security, the additions to the terminal include an in-line Baggage Handling System utilizing 13 CTX machines, full body scanners installed by the U.S. Transportation Security Administration, and a new close circuit TV network of digital cameras with pan and zoom capability.

By Gordon Phillips, Vice President and Director, www.leoadaly.com

Flying Responsibly: The Winnipeg Airport LEEDs the Way

by Samantha Shah, Senior Marketing Coordinator, and Philippe Roulston, Marketing Team Leader, Stantec Architecture

As a whole, the green building phenomenon has taken off with a certain amount of vigor, but this is not true for buildings in every sector. Converting to sustainable practices is already tried and tested in the corporate, commercial, and residential sectors. It has also been uniquely tailored to meet the needs of health care, education, and government applications. However, given the size of airport terminals and their unique and complex functions, green applications in the airport sector have been more challenging.

Further, few community structures rival an airport's burden of responsibility. Serving as the gateway to a city, an airport acts as the director of first impressions. It tells a story. The airport is the first glimpse into a new city and leaves clues that offer insight into the city's culture, its history, and, possibly, its civic ambition.

"Our emphasis from the early days of this project has been on efficiency in design," says Winnipeg Airports Authority vice president Bob Edgar. "This has provided the key connection for sustainable development."

As it turned out, the "greenfield" nature of the new Terminal Building project at the Winnipeg International Airport also provided the perfect opportunity to explore uncharted design territory. As a completely separate building, the project offered significant innovative design potential, without the constraints presented by harmonizing with an existing facility.



■ Airport terminal, Winnipeg
Stantec Architecture/Pelli Clarke Pelli

So the client, in consultation with the Airport Advisory Committee on Environment, and Stantec's design team established a sustainability committee to explore the application of traditional green design principles to this non traditional project type, and the team conducted conceptual tests on several. As a guide, the team used the LEED® checklist created by the Canada Green Building Council.

Preflight . . .

The team explored the use of ground source cooling to reduce overall energy demand. It drilled several test sites to more thoroughly assess the feasibility of this option, but due to the specific groundwater conditions on site, the process was not found to be feasible.



Alternative energy strategies that harness solar power to offset operational power requirements were also evaluated. However, a detailed investigation and life cycle analysis revealed that roof-mounted photovoltaics were unsuitable from a financial perspective.

Not to be discouraged, the design team also investigated green roofs. In addition to combating the heat island effect associated with the traditional tarred approach, green roofs assist with stormwater management and also reconnect buildings with nature by restoring some of the natural environment that is altered or eliminated by the creation of a new building. Sounds great! But green roofs also, unfortunately, encourage wildlife, which airports, for safety reasons, try to discourage.

. . . and Liftoff

As it turned out, determining which possibilities within the LEED framework were suitable for airports was a significant challenge. However, the design team was able to apply several effective sustainable approaches to this airport's design and most notable for passengers will be the use of natural light.

Daylighting studies revealed the importance of natural light within the airport environment for a variety of reasons, including aesthetics, reduced energy consumption, and end user comfort. This inspired the design of a large central atrium with a full skylight right at the front entrance. Skylights and glass were also incorporated into the design, giving the airport a feeling of transparency.

Experiencing this transparency from the inside out, travelers will be able to see right through to the planes on the tarmac as soon as they set foot in the terminal. So they will always know where they have to go, and they will know how to get there (finding the right gate should be easy and straightforward). Add to this the efficiency of consolidated check-in counters and baggage handling areas and a single security checkpoint for domestic and international travelers (a first for a Canadian airport), and you have one of the most practical, passenger- and environment-friendly airports on the continent.

Making It Work

It is one thing to identify sustainable design opportunities in an airport but quite another to achieve them economically.

The design team had been using the LEED scorecard from the start as a guideline for the sustainable development of the Winnipeg International Airport's terminal building and associated works, even before registering the project, so it was poised to identify and secure funding to offset the cost of reaching its sustainable goals. For example, the Province of Manitoba provided \$75,000 for LEED certification. In addition to provincial incentives, this is the first airport in Canada to qualify for the Commercial Buildings Incentive Program, which rewards new facilities for energy performance greater than 25 percent better than the Model National Energy Code for Buildings (MNECB).

The building also qualifies for the Energy Innovators program, which financially rewards successful applicants for substantially upgrading their central utilities boiler systems to reduce greenhouse gas emissions.

Flight Schedule

Winnipeg will be the first city in Canada and only the second in North America to have a LEED-certified airport. Have we created a new prototype for airport design? Perhaps. Do we now know everything there is to know about applying sustainable design in an airport setting? Perhaps not. But the Winnipeg International Airport project will definitely serve as an exciting starting point.

by Samantha Shah, Senior Marketing Coordinator and Philippe Roulston, Marketing Team Leader,
www.stantec.com



Indianapolis Opens First Sustainable Post-9/11 Greenfield Terminal

By Rasmus Ripley, Project Lead Designer, HOK

As the largest civic project to be completed by the city of Indianapolis, the Col. H. Weir Cook terminal complex is built “midfield” between the gateway’s two main runways. The terminal includes a new ticketing hall, central passenger security, baggage claim area, administrative offices and as many as 40 gates that can collectively accommodate a complete range of both narrow and widebody aircraft.

The terminal is also the first post-9/11 designed facility specifically planned for the heightened security procedures in air travel in recent years. Among the security-driven innovations are two large halls, one for each concourse, designed to accommodate passenger screening, as well as a separate circulation system for vendors and employees.

Landside development at the terminal provides roadway access, utilities distribution, vehicle parking, support facilities and commercial development areas.

Airside development provides aircraft gates and remote parking areas, access to the runways and aviation support facilities.

This project also provides the opportunity to develop a more environmentally-friendly facility. The terminal is designed with the latest “green” practices that are considered hallmarks of Sustainable development. Natural Light Modeling and Analysis Roof Overhangs for Shading Automated Water Controls Reduced Taxi Distances/Times Low-E and Fritted Glazing Radiant Heating and Cooling Low Emission Materials Recycled Existing Materials.



■ Col. H. Weir Cook terminal, Indianapolis International Airport_HOK

SIZE

1,200,000 sq. ft.

SERVICES

Architectural Design, Facility Programming, Interior Design, Land Use Planning, Landscape Design, Lighting Design, Terminal Planning

COMPLETION

2008

COST

\$939 million

This project also provides the opportunity to develop a more environmentally-friendly facility. The terminal is designed with the latest “green” practices that are considered hallmarks of sustainable development.

Site

The use of native plant materials, specifically chosen not to attract birds to the airport site, combines with a high efficiency irrigation system to reduce landscape water consumption. Site lighting design eliminates stray light, enhancing safety and visibility and saving energy. As part of an ongoing program, the airport has protected, restored, and expanded wetlands and endangered species habitats in the vicinity.

Water

The roof channels rainwater for collection and use inside the terminal. Water-saving fixtures with automated controls impose less demand for water and waste treatment.



Energy

Selective use of landscaping, paving materials, and roofing reflects and dissipates heat and stabilizes outdoor temperatures around the site. The heating and cooling system only supplies cool air to the 10-12 feet of space from the central plaza floor upwards, while much hotter air gathers at the top of the building. This natural convection system should save 21% in energy usage below ASHRAE and more than \$12,000 a year. Meanwhile, the floor is cooled with water piped beneath, which keeps the temperature comfortable for people at floor level.

Materials

The construction of the new terminal recycled 7,000 tons of old taxiway and roadway material by using it as site fill. More than 90 percent of the materials were sourced from within a 500-kilometre radius of the site in order to lower transportation costs, energy use, and pollution while boosting the local economy. Many of the “ordinary” building materials on the project actually have significant recycled content. Recycling stations throughout the New Indianapolis Airport will channel waste into community recycling programs.

Indoor Environmental Quality

Controlled indoor daylight reduces demand for artificial light. The terminal’s transparency also offers views of the city skyline and helps travelers orient themselves, allowing them to look ahead to their destinations at gates, ticketing, baggage claim, vehicle access, and dining in the large, central “Civic Plaza”. Heating and cooling systems continuously monitor temperature, humidity, and air quality monitoring to ensure comfort and proper ventilation.

By Rasmus Ripley, Project Lead Designer, www.hok.com

Automatic Debris Detection – a step closer to increased capacity and lower emissions

By Dr Dominic Walker, Product Development Director _ QinetiQ Airport Technologies

We are entering a challenging period for airport operators. Despite the recent fall in passenger numbers, long term demand for air travel is forecast to continue increasing, with the latest ACI figures still predicting a doubling in numbers by 2025. However the prevailing economic conditions have forced many operators to review their current capital investment programmes; major expansion projects may be deferred, and every dollar, euro or pound spent must achieve maximum return against the airport’s key objectives. Even at airports considered the industry’s great success stories, credit conditions and falling numbers are causing operators to look long and hard at key infrastructure projects. In recent months, both Vienna and Dublin have announced they may defer new runway construction.

At the same time, the implications for airports of the SESAR and NextGen programmes, which have so far concentrated primarily on capacity in the air, are being fully appreciated. Delivery of these long term programmes will require airport investment now. In order to ensure that the airports, the nodes in the overall air traffic system, do not become the bottlenecks, they must increase their capacity. Given the current difficulties of physical airport expansion, this must be delivered through either new procedures, new modes of operation, or new technology.

In whatever way it is achieved, increased capacity is coupled with a number of additional targets which, in the absence of any other change, run counter to higher throughput. Looking specifically at SESAR for example, three of its primary goals for 2020 are:

- Provide capacity for a 73% increase in traffic, which will also reduce delays.
- Improve safety by a factor of three.
- Enable a 10% reduction in the effects flights have on the environment



In short, the challenge is to handle more aircraft in a safer and greener way. Economic conditions mean airports must consider how any single investment can play into all of these areas, as attacking each individually would be expensive and inefficient.

Automatic Debris Detection

The safety improvements which an automatic foreign object debris (FOD) detection system would bring are intuitively understood – continuous inspections will allow rapid removal of debris which could otherwise have remained on the runway for hours, where it is a risk to every passing aircraft. Indeed, data from some

of the early installations of FOD detection equipment, such as the QinetiQ Tarsier system at Vancouver International and London Heathrow, suggest that operators currently underestimate the amount of FOD on the runways, and consequently underestimate the risk. Over two years of operation since January 2007, Vancouver report that they have found and removed over 400 items of debris using the system, including four or five “significant” pieces which would have constituted a major risk had they gone undetected.

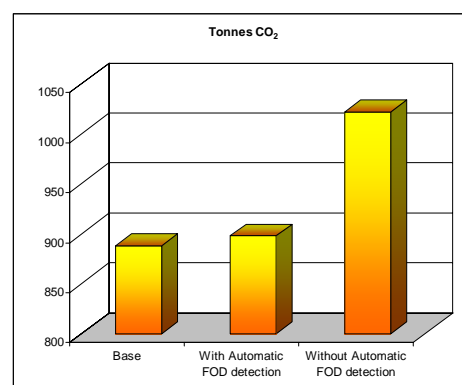
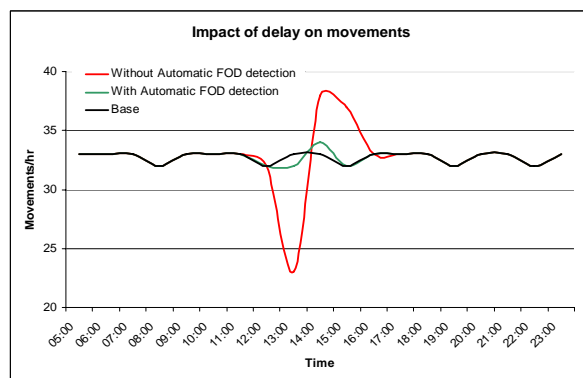
It is also interesting to look at the other benefits which automatic and rapid FOD detection could bring. A simple scenario is that of a pilot report of FOD on the arrivals runway, given with an inaccurate description of the nature of the item or its precise location (“There’s something on the runway just past taxiway Mike”). This may lead to a runway closure whilst the item is found and removed. On occasions, particularly in low visibility, this closure could be relatively extended as the item may prove hard to find. The impact of this on the traffic flow has been modelled in the figure below, assuming normal operations of approximately 33 slots per hour and a 19 minute runway closure. The drop in landings and the subsequent peak to get the stacked aircraft on the ground is severe, and the flow takes around four hours to recover.

Also modelled in the figure below is the same scenario but with an automatic detection system operating. Assuming that this detects and locates the object to sufficient accuracy, the runway closure will be significantly reduced. Here, 5 minutes is used, based again on data from the Vancouver Tarsier installation. The model shows that the immediate impact is minimised, and the time taken for recovery to normal flow levels is also greatly reduced.

If over an extended period it is seen that use of FOD detection technology reduces average runway closure times, the airport may be able to increase its declared capacity.

Another key target is environmental impact. With the runway closed aircraft will need to stack, increasing the overall CO2 emissions. This increase has been modelled for the scenarios with and without an automatic detection system, and compared to the baseline situation with no delay. This suggests that a 19 minute delay leads to an extra 134 tonnes of CO2, or 15% of the total produced in the day. The shorter delay facilitated by automatic detection of the debris gives rises to just 10 additional tonnes, or 1% of the daily total.

The impact of delay due to FOD with and without automatic detection, in terms of throughput (left) and CO2 emissions (right)



These benefits to capacity and emissions from a FOD detection system may be considered secondary to the additional safety it brings to the airport. However, when facing the challenges of the SESAR and NextGen targets, in the current economic conditions, an investment which plays into not just one but multiple areas is an interesting proposition. When looking to maximise existing capacity, or make any contribution to the climate change battle, every little helps.

By Dr Dominic Walker, Product Development Director, QinetiQ Airport Technologies, www.QinetiQ.com/Tarsier.

INCREASING AIRPORT NON-AERONAUTICAL REVENUE

Take-off to Success with Airport Parking and Passenger Management

By Simone Frank, Simone Frank, Business Development, SKIDATA AG.

Passenger parking over the past fifteen years has evolved into a crucial customer service and source of revenue at airports around the world. As a result, demand for comprehensive solutions to manage parking and additional revenue generating services has been on the rise. This article takes a look at what is possible today and where the future lies in efficient, value-generating airport parking and passenger management. In short, the key to success lies in integrated solutions that cover the entire service chain from the car park to the boarding gate.

With mobility as a definite must in our increasingly globalised society, passenger parking at airports has evolved into an equally definite must-have service for today's air traveller – so much so that by now it is widely considered synonymous with service quality and efficient customer care. On the operator side, car parking and related services are a top priority. As the results show, it pays to do so: parking typically ranks as one of the most important sources of airport revenue, second only to air ticket sales.

After all, it's the first and last impressions that count, they say. For the increasing number of airport users arriving by car, this means their impressions – and, as a result, their customer loyalty – are significantly influenced by the parking facilities and services.

More than just parking

When it comes to modern airport parking, simply providing a parking space doesn't cut it anymore. Fierce competition and an increasingly demanding clientele have put the task of adding extra passenger services high up on the agendas of airport operators. As surveys show, most passengers are quite prepared to pay for services that they can be sure that they're getting good value for money. As a result, air travellers today can choose from a variety of helpful services that make their travelling experience more convenient and safe than ever before. One can pre-book an entire flight package over the Internet, complete with the parking service of one's choice (anything from VIP booking with valet services to economy parking at low early-booking rates). What's more, at the car park frequent flyers can collect or spend air-miles when using the parking facilities.

Obviously, none of this would be possible without the enabling support of the latest technologies and solutions. Systems need to interface with each other, exchanging vital data, controlling processes, granting access, issuing information and warnings where necessary.

What does a comprehensive, modern solution look like? The ideal solution is one that gets travellers from the car park to the boarding gate with the same ticket in a way that's convenient for the traveller and profitable for the operator. This involves a variety of business critical factors, such as



1. Openness in terms of business support (to ensure revenue generation):

- integrating services of other airport stakeholders (airlines, concession & retail operations, etc.)
- interfacing with frequent-traveller services (to allow frequent-flyer cards to double as parking permits)
- supporting business models requiring bundled travel packages that include airport parking (Park&Fly)
- working with on-line booking and sales platforms to offer parking reservation and journey-related services over the Internet
- providing detailed, transparent reporting and business statistics for proper business planning and development

2. Technical openness (to maximise return on investment):

- integrating with existing third-party systems and infrastructures (such as Customer Relationship Management, Enterprise Resource Planning systems and other back-office applications)
- accommodating airport security concepts and facilities (this usually includes features such as number plate recognition, CCTV and biometric control systems, etc.)

3. Minimum operating and maintenance requirements (e.g. through centralised remote control of all system components)

Of course, this list is by no means exhausting, and further challenges (such as terrorism protection) are added all the time. For the technology, this means that staying flexible and being ready for future needs is vital to meet these needs.

From the car park to the terminal

Inside the airport, operators can welcome their guests with a whole range of additional revenue-generating services, such as (paid) access to convenient waiting areas or visitor platforms. Thanks to automated ID control at the entrance, every transaction is fully transparent, yielding valuable data for marketing initiatives. All systems can be centrally monitored and controlled, which keeps running costs and staff requirements low to ensure maximum return on investment.

Capitalising on kiosks

When it comes to selling value-adding services, kiosks are a highly efficient way to complement sales channels such as on-line web shops of airport operators and other service providers such as airlines. Powered by the latest interactive technologies, kiosks let guests pick and choose from a wide range of products and services quickly and conveniently: tickets to visitor platforms, lounges and restricted waiting areas, for example. In addition, kiosks are a convenient, cost-efficient way of collecting airport taxes and airport development fees.

Current trends and voices from the market make it clear that packaged solutions like this are in demand when it comes to non-aeronautical revenue generation. What is more, they will be beneficial not only to airport guests but also to the airport industry.

By Simone Frank, Business Development, www.skydata.com

Airport Advertising – a dynamic media channel

By Charles Hugill, Creative Intelligence Director, PSI Advertising

Nowhere has the recent mushroom-like growth of out-of-home advertising been more evident, than in the world's airports. Digital screens have been at the forefront of this explosion and, as a means of increasing the range of opportunities for advertisers to communicate with a highly desirable audience, they are unparalleled.



Even with trends in passenger figures currently on a flatter trajectory than in previous years, there are still nearly 5 billion people travelling through airports every year. Each one of those represents a target for any advertiser from any sector. Things have moved on from the days when tobacco and alcohol brands dominated proceedings. Nowadays no category of advertiser using the right creative, combined with the right implementation and media selection, would be out of place in an airport – such is the variety of choices available.

As well as traditional “out-of-home” media formats, many of which can be seen in downtown shopping malls and subway stations, airports offer a range of advertising possibilities almost as diverse as the number of nationalities passing through the typical terminal.



■ Examples of digital screen advertising at Heathrow, Terminal 5

During a recent analysis, it was established that there were approximately 60 distinct media formats to be found in and around airports all over the world.

That number excludes the huge variances in dimensions, illumination methods, material specification, for example. The single most significant media format to take hold in airports in recent years has been Digital.

This umbrella term includes the entire range of screen-based advertising locations, with many variations in size and orientation, from the 42” basic model, to the enormous megascreens in Dubai, Shanghai and Singapore. Technological advances have led to lower capital costs which have in turn made installing the requisite infrastructure more affordable. However, when combining the cost of the screens with that of the software required to run a large network, together with diagnostic reporting systems and content management programmes, funding is likely to remain a major issue for any out-of-home media owner embarking on the digital path. As a consequence, the best results are when the burden of capital expenditure is shared between the landlord i.e. the airport, and the site vendor i.e. the media contractor or concessionaire. In return and in addition to a share of the advertising revenue, the airport can utilise time-slots on the screens to display information that will be relevant to passengers e.g. time to gate, customs regulations, onward journey updates, and so on.

In the last 2 years developments in this market have brought the airport advertising medium to a point where the global footprint of digital media inventory covers every region of the world. In the UK, out-of-home digital formats grew by 57% during 2007/8, while all other media declined (by as much as 9% in the case of radio). Airports are at the vanguard of this revolution and as penetration increases, so will visibility. It will not be long before an advertiser will be able to place an entire pan-regional or even global airport campaign, using digital media **only**. Local variations such as campaign-selling periods, slot lengths and aspect ratios are bound to remain, but they are easily managed, with the help of a knowledgeable airport media specialist agency.

Research undertaken by leading concessionaires JCDcaux and Eye Corp, has identified a number of key findings to do with the way in which airport advertising is consumed and absorbed by passengers. Digital media prompts “saccadic” eye movements, which dictate a non-linear viewing pattern for screens arranged along the same elevation, for instance. Passengers engage with advertising panels for much longer than

the minimum requirement for an exposure to be remembered. Typically they will look at the same panel or screen up to twice, and during a normal journey through the terminal will experience as many as 100 advertising “impacts”.

The quality of the environment and the mood of the passenger can play an enormous part in influencing receptiveness - within the target audience - to advertiser-funded messaging. Today’s airport terminal is the equivalent of the Victorian railway termini or “cathedral of steam”. New airport buildings embody the best in architectural design, with an emphasis on space and light, and are truly energising places to be. Couple that with the prospect of international travel, with some of the best retail offerings on the planet, and with the possibility of flying on technological marvels such as the Airbus A380 or the forthcoming Boeing 787 Dreamliner, and you have a truly intoxicating mixture, the like of which occurs nowhere else.

For many airports, advertising has long been recognised as a valuable source of non-aviation revenues. Given current economic pressures and in such a tightly-regulated sector, any means of generating an income that can make a difference to the bottom line, is surely to be welcomed. However, it is worth sounding a note of caution.....Advertising and media sales are unlikely ever to be the saviour of an airport’s fortunes and when RFP’s are out, revenue expectations need to be realistic on both sides of the table. Advertising is not retail, nor will it ever operate in the same way. Flexibility and security of tenure should be incorporated into advertising concession contracts so that, with careful management, the best possible results are achieved for all parties concerned.

By Charles Hugill, Creative Intelligence Director, www.psiad.com

Terminal Waiting Area Seating as an Advertising Medium

By Ingmar Krupp, Business Development Manager, Kusch+Co Sitzmöbelwerke GmbH & Co KG

Terminal seating for passengers are installed in large quantities in every major airport. This has provided an ideal opportunity to develop new concepts to use the surfaces of the seating for advertising purposes and as additional revenue generation for the airport operators. In addition, over a period of time, this could recover the cost of the seating. This innovative development has several possibilities.

Backrests of the waiting area seating

Many theatres, concert halls and opera houses already have their seats unobtrusively labelled with names or sponsor logos. In a similar, yet higher profile manner, the backrests of the waiting area seating, either individually or in groups, can be covered with a printed fabric. Therefore the logo can be spread across one or several seats. At the end of the advertising contract, it is possible to economically exchange the upholstery pads with advertisements of new advertiser.

Table tops are ideally suited as advertising space

A second, yet uncomplicated method to advertise is to attach a printed advertisement with the promotional message to the table top. The foil is retrofit table and easily removed and replaced. The Ruzyně Airport in Prague has been availing itself of this method very successfully. The foil costs are negligible and for example a three month advertising campaign would be feasible and cost effective.

Picture frame fitted to the table top

The third variation consists in a picture frame fitted to the table top, thus being clearly visible from a great distance. The added advantage is that the advertisements can be changed quickly and easily. The picture frame can be opened only with a special key. This is well suited for promoting special offers in the Duty Free Shop or for showing the way to a nearby store.



Flat screens fitted above the seating

This seating has even more possibilities for advertising space, thanks to integrated flat 2-way screens fitted above the seating, supported on modular frames. Besides flight information, it would also be possible to show short commercials or promotional films, for example, corporate presentations.

Some types of terminal seating makes you feel at ease and although it may not fulfil immediately obvious advertising purpose, it can well increase the turnover in the shopping area. A seating with all the necessary attributes make shoppers feel relaxed and enhancing their airport experience.

By Ingmar Krupp, Business Development Manager, www.airportseating.aero



- Seating with integrated flat 2-way screens fitted_Kush+Co

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