ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

The Fuel Factor

Coming to terms with the serious threat posed to aviation by 2008's volatile fuel prices, and a look at the steps that ICAO and IATA began to implement to help abate its continued assault on airline and air transport viability.

Also in this issue:
John Fahey on aviation non-CO_2 multipliers • ICAN Conference
Airports and ICAO CAEP objectives—the Zurich example
Weather advisory integration • IAOPA feature and editorial

Vol. 64, No 1

FROM THE WORLDWIDE LEADER IN SECURITY METAL DETECTORS

CEIA EMDs

STATE-OF-THE-ART
ENHANCED METAL DETECTORS

CEIA PD140SVR,
ENHANCED HAND HELD METAL DETECTOR

CEIA SAMD, SHOE ANALYZER

CEIA EMD APPLICATION

- Fully compliant with the New Security Standards for Conventional and non-Conventional Weapons
- Unsurpassed Passenger Throughput
- Exceptional Immunity to Environmental Interference

CSQ IQNet CERTIFIED MANAGEMENT SYSTEM

UNI EN ISO 9001 CERTIFIED

ceia®

www.ceia.net/emd

THE ICAO JOURNAL
VOLUME 64, NUMBER 1, 2009

Editorial
ICAO Coordination, Revenue
and Communications Office
Tel: +01 (514) 954-8220
Web site: www.icao.int

Anthony Philbin Communications
Editor: Anthony Philbin
Tel: +01 (514) 886-7746
E-mail: info@philbin.ca
Web site: www.philbin.ca

Production and Design
Bang Marketing
Stéphanie Kennan
Tel: +01 (514) 849-2264
E-mail: info@bang-marketing.com
Web site: www.bang-marketing.com

ICAO Photographs: Gerry Ercolani

Advertising
FCM Communications Inc.
Yves Allard
Tel: +01 (450) 677-3535
Fax: +01 (450) 677-4445
E-mail: fcmcommunications@videotron.ca

Submissions
The *Journal* encourages submissions from interested individuals, organizations and States wishing to share updates, perspectives or analysis related to global civil aviation. For further information on submission deadlines and planned issue topics for future editions of the ICAO *Journal*, please forward your request to info@philbin.ca.

Subscriptions and single copies
Yearly subscription (Six Issues per year) US $40. Single copies available for US $10. For subscription and sales information please contact the ICAO Document Sales Unit,
Tel: +01 (514) 954-8022
E-mail: sales@icao.int

Published in Montreal, Canada. ISSN 0018 8778.

PRINTED BY ICAO

Contents

Leadership and Vision in Global Civil Aviation

Rapid Response

ICAO's reaction to the 2008 fuel crisis demonstrated how much the Organization has evolved as a responsive and dynamic component of the global aviation system. It also highlighted the culture of continuous and performance-based improvement which now permeates all sectors of the Organization's activities.

Vince Galotti, Chief of ICAO's Air Traffic Management Section, reviews the timeline of the 2008 crisis and describes both the Organization's timely response to the new priorities brought on by these extraordinary circumstances, as well as the means by which ICAO's more proactive approach to efficiency and the environment better prepared it to meet the enormous challenges posed by the fuel crisis.

***ICAO Journal*: Recount, if you would, the steps that were undertaken after IATA first contacted ICAO about the emerging 2008 fuel crisis.**

Vince Galotti: IATA came to ICAO to discuss the fuel price issue in the middle of 2008 — basically as soon as the severity of the situation had come to be recognized. At that point, the airline bankruptcies had already started to mount and the scale of the continuing collapse that was being projected by IATA made it clear that all of aviation was in the midst of a very serious crisis.

We had a series of emergency meetings to establish some early objectives and very soon afterward a briefing to the ICAO Council was arranged. This briefing featured presentations by Narjess Tessier, Chief of ICAO's Economic Analyses and Databases (EAD) Section, Nancy Graham, Director of ICAO's Air Navigation Bureau (ANB), and Günther Matschnigg, IATA Senior Vice-President, Safety, Operations and Infrastructure (SO&I).

Ms. Tessier provided a detailed statistical background and an up-to-date analysis of where things stood economically, establishing a clear context for further action. Ms. Graham outlined ICAO's overall work programme on efficiency and identified near-term areas of ICAO activity that could prove beneficial. Lastly, Mr. Matschnigg stressed the huge impact being felt by his association's scheduled air carriers and the threat that the crisis was posing to the viability of the international air traffic system.

With respect to the ANB presentation and the fact that ICAO is already pursuing a wide range of efficiency improvement objectives under its current Air Traffic Management (ATM) Operational Concept and Global Air Navigation Plan, what specific areas was IATA requesting that priority be given to?

Under the programmes that you mention, ICAO has been working closely with its Regional Offices to identify specific performance-based air navigation and air traffic management efficiency improvements. ICAO's existing vision, plan and activities already address fuel consumption objectives because,

“Today’s generation of pilots, controllers, operators and regulators have much higher levels of environmental and efficiency awareness than was the case in the past and, though the most recent fuel crisis lit a slightly hotter fire under us, in general, a broad culture of performance-based efficiency has been evolving in aviation in recent years and I’m confident that improvements in related areas will be constant and ongoing among all stakeholders.”

in the end, all efficiency-related improvements inevitably have a positive effect on lowering fuel burn and fuel costs.

IATA's primary objective with these meetings and presentations was to instill a new sense of urgency around certain elements of ICAO's existing efficiency programmes and initiatives. They identified three main areas that required a more dynamic approach to solution implementation: route and Terminal Control Area improvements; operational guidance relating to Continuous Descent Arrival (CDA); and fuel management improvements.

These categories are now being closely cooperated on and revised. In fact, agreed timelines had been set relating to the release of new guidance material for each while the crisis was still with us. To cite but one specific example, ICAO responded in part by focusing more energy and attention on the new CDA-related Manual it now has under development and has moved the publication date for that resource ahead considerably as a result.

Was this then the full extent of the cooperation that the scheduled airlines had been seeking?

IATA also made a point of requesting of ICAO that it should "get the message out" to global Air Traffic Control (ATC) stakeholders, so that they too would be fully aware of the gravity of what was unfolding and re-double their efforts to provide the straighter routes and increased frequency of CDAs that the airlines were looking for.

We need to stress here that controllers are being trained today to *always* seek out the most efficient routes and to take advantage of CDA and other efficiency benefits at every opportunity. That's their job for the most part and they're becoming much more proactive in this regard.

How would ICAO follow-up on this type of request?

ICAO generally communicates this type of guidance and stresses any need for a more proactive ATM approach through its Regional Planning and Implementation Groups (PIRGs). The PIRGs make requests to the States in their Regions to go to their Air Navigation Services Providers (ANSPs) and ensure that controllers are constantly being made aware of the efficiency improvement tools and measures that are available to them. IATA also participates constructively in these PIRG activities and greater cooperative efforts were made during the crisis to help stress these efficiency points even more strongly.

It was very gratifying to see that these messages were very well-received by the ANSPs and also to witness the degree of heightened and truly more effective cooperation that could be achieved in a relatively short time-frame.

What other areas of specifically Air Navigation Bureau activity might the Organization have leveraged to assist the industry had the crisis persisted longer than it did?

It's very hard to pin this answer down to a few key points because so much of what we do in these areas relates to precisely the same sort of objectives that the crisis helped to draw attention to.

To name a few areas there's the Operational Data Link Panel (OPLINKP), which will now act as a focal point for the consolidation and development of ATM data link operational requirements globally. The Separation and Airspace Safety Panel (SASP) is constantly looking for ways to minimize separation and has done great work in recent years in the areas of Reduced Vertical Separation Minima (RVSM). At a recently-concluded major meeting in Africa, by way of a recent example, ICAO submitted performance framework forms suggesting improvements for virtually every operational area. These included a new ICAO flight plan that AFI stakeholders now have until 2012 to implement, RVSM gains in higher airspaces, terminal and Required Navigation Performance (RNP) approaches, and also better meteorological (MET) information so that aircraft cannot only avoid volcanoes and hurricanes and other forms of dangerous weather, but rather fly as closely as possible to these MET events to allow them to get off the ground earlier and take advantage of the most efficient routes that are possible.

And in terms of IATA's specific request regarding fuel management strategies?

That's an area that's been under study for many years now and which is currently being overseen by ICAO's Flight Safety (FLS) team. There's a wide range of ICAO guidance that touches on possible areas where fuel savings can be realized and these are all constantly being reviewed in the interest of improving efficiency and diminishing fuel burn. As with all efficiency-related improvements today, any new solution represents a win-win situation from both the fuel cost saving and environmental impact standpoints, which means there's generally very high degree of priority being associated with research in this area and a quick turnaround with new or revised guidance materials.

ICAO is constantly reviewing its various areas of guidance to ensure that safety objectives and performance objectives are as harmonised as possible. Certain safety levels that were prescribed over the years, though effective, occasionally demonstrated elements of safety overkill at the expense of performance.

Today's generation of pilots, controllers, operators and regulators have much higher levels of environmental and efficiency awareness than was the case in the past and, though the most recent fuel crisis lit a slightly hotter fire under us, in general a broad culture of performance-based efficiency has been evolving in aviation in recent years and I'm confident that improvements in related areas will be constant and ongoing among all stakeholders. ■

The 2008 fuel crisis: The airline perspective

The onset of the global recession helped to demonstrate that 2008's oil prices were likely the cause of speculation rather than an indication of the commodity's fair market value. Nonetheless, because fuel represents any carrier's second-highest operational cost after labour, any increase in the cost of oil can have dangerous repercussions for the airline industry.

In this interview, Brian Pearce, Chief Economist of the International Air Transport Association (IATA) discusses the impact of the 2008 oil price crisis on the airline industry as a whole and provides insight into the measures, means and alternatives available to airline planners as they seek to avoid the potentially catastrophic impact of rising fuel costs in the near and longer term.

ICAO Journal: **How detrimental to aggregate airline performance was the 2008 fuel crisis?**

Brian Pearce: The doubling of jet fuel prices from an average of $90/b in 2007 to peak at $180/b in July 2008 was the principle cause of the airline industry slipping from net profits of $12.9bn in 2007 to an estimated loss of $5bn in 2008. The fuel bill rose from $136bn in 2007 (28 percent of operating costs) to $174bn (32 percent of operating costs) in 2008. At its peak in the middle of the year fuel costs were well over 50 percent of operating costs and rising.

Largely as a result of the strains to cash flow caused by this unprecedented shock, over 30 airlines have ceased scheduled operations, with the majority going out of business.

With a number of analysts (e.g. Goldman Sachs) forecasting $200/barrel during the summer of 2008, many airlines hedged

Air Traffic & Navigation Services.
Young enough to go the distance. Wise enough to know how.

With **pride** we invest into human talent to empower the future. With **passion** we manage ten percent of the world's airspace. With **integrity** we partner with Africa's developing countries to enhance safety. With **foresight** we contribute to global aviation intelligence. And with **confidence** we recognise that air traffic management is so much more than just moving aircraft safely through the sky.

Unlocking Partnerships for Change Managing 800 000 aircraft movements by 2010

AIR TRAFFIC & NAVIGATION SERVICES

ATNS

Unlocking partnerships for change

CELEBRATING 15 YEARS OF ATNS • 1993 - 2008

www.atns.com

a significant portion of their 2008 second half and projected 2009 fuel needs at mid-2008 prevailing prices. Now that spot fuel prices have fallen back many of these hedges have locked airlines into higher fuel costs leading to additional losses.

Another impact of the fuel price spike was to force airlines to make drastic cuts to their capacity plans, particularly in the US where airlines are cutting their capacity in domestic markets by 10 percent. This will likely be a beneficial move for US airline profitability as capacity has been cut ahead of what is expected to be the deepest recession since the early 1980s.

What were the initial responses by IATA and by its carriers as the scope and impact of the crisis began to be more clearly understood?

IATA intensified its already established Environmental Campaign in the areas of Operations and Infrastructure through a specially designed Crisis Action Plan. The main elements of this Action Plan may be summarized as follows:

- Intensifying cooperation with governments, ICAO and Air Navigation Service Providers (ANSPs) to accelerate the implementation of fuel saving measures on route or Terminal Control Area (TMA) improvements.
- Extending and enhancing Green Team support to reach as many airlines as possible in order to support them in identifying and implementing improved fuel efficiency measures.
- Reacting to the adjustment of fleet capacities, as mentioned above, combined with the selective retirement of less efficient aircraft.

With the exception of Kuwait and tar sands-type operations, break-even costs per barrel for most oil-producing nations hover between the $30 and $40 level. At approximately what level would the airline industry need oil prices to stabilize in the short term in order for it to remain profitable based on current technologies and operational measures?

Airline and/or aircraft profitability depends on many factors. When economic growth and travel demand is strong, airlines can be profitable with high fuel prices. Jet fuel averaged $90/b in 2007 and the industry generated $12.9bn in net profits. Yet in 2009 the price of jet fuel is expected to be lower at $74/b but the industry is forecast to be in net loss, primarily due to more generalised recessionary impacts.

Do infrastructure advances, such as those being pursued under NextGen in the U.S. and SESAR in Europe, represent a solution to airline fuel worries or simply near-term relief as more effective solutions are sought?

The harmonised and strategic implementation of new infrastructure developments is essential to support further fuel efficiency improvements. It must be taken into account that advances in aircraft technologies will only lead to increased fuel savings if the infrastructure these new aircraft operate within allows them to fly to their full potential.

IATA and ICAO held discussions on this issue in 2008 when its severity began to become apparent. What was the substance of these talks and did they prove helpful from the airlines' perspective?

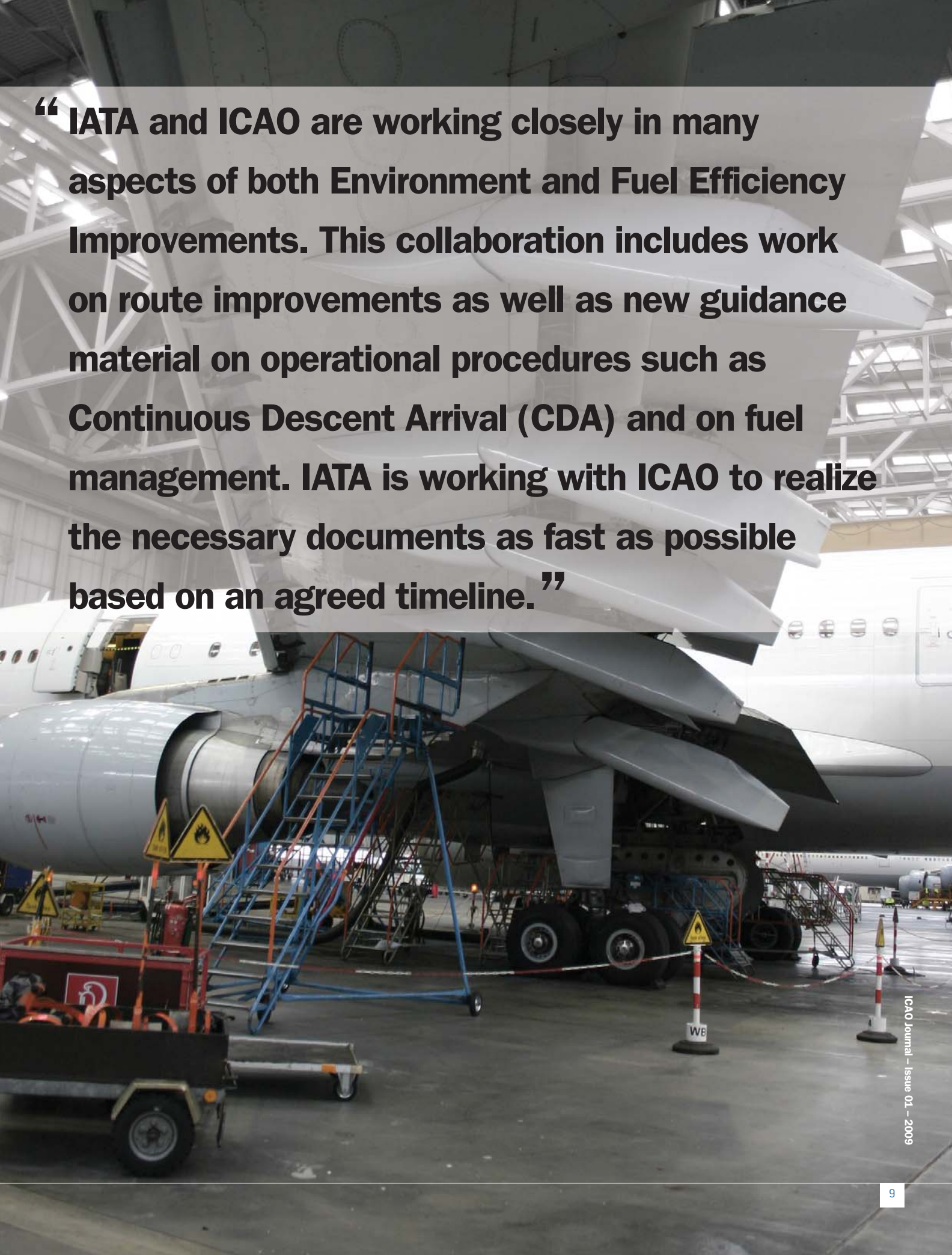
IATA and ICAO are working closely in many aspects of both Environment and Fuel Efficiency Improvements. This collaboration includes work on route improvements as well as new guidance material on operational procedures such as Continuous Descent Arrival (CDA) and on fuel management. IATA is working with ICAO to realize the necessary documents as fast as possible based on an agreed timeline.

Airlines with sufficient capital resources have been able to hedge their fuel prices in the past several years to offset some of the significant increases that have been seen. Is there any discussion at this stage in IATA with respect to a need for carriers to begin collectively pooling capital to try and create benefits of this nature that are more industry-wide?

As I indicated earlier in response to the opening question, fuel hedging is not always a benefit. Many airlines that pursued hedging strategies in 2008 are now locked into fuel prices that are considerably higher than current spot prices. That being said, hedging in general, when employed as a risk management tool using instruments such as options—effectively paying an insurance premium—is unambiguously beneficial. To address your suggestion for the development of a collective hedging approach, IATA and its Members regard the hedging of risk exposures as a fundamentally commercial activity and a source of competitive differentiation. As a result, this sort of collective pooling would not be appropriate for the Association to become involved with.

There have been several higher-profile tests of alternative fuels (AFs) in the past couple of years. ICAO's Environment Unit also has a Workshop on AF viability and rollout scheduled for February 2009. As far as you are aware, how much time and energy is currently being expended on finding alternatives to oil by IATA's airlines and do you feel that AFs now represent the best solution to the potentially catastrophic impact of sustained higher oil prices?

These tests are based on second-generation bio-fuels that minimize impact on both the environment and the food chain markets. IATA considers these accelerating activities on Alternative Fuels as an essential element of its Four Pillar Strategy. Our airlines are focused on both of the potential advantages represented by AFs, namely a decreased dependency on crude oil and a significantly minimized impact on the environment. ■



“IATA and ICAO are working closely in many aspects of both Environment and Fuel Efficiency Improvements. This collaboration includes work on route improvements as well as new guidance material on operational procedures such as Continuous Descent Arrival (CDA) and on fuel management. IATA is working with ICAO to realize the necessary documents as fast as possible based on an agreed timeline.”

Mitigating losses and planning for recovery

Providing context to the fuel and finance crises of 2008

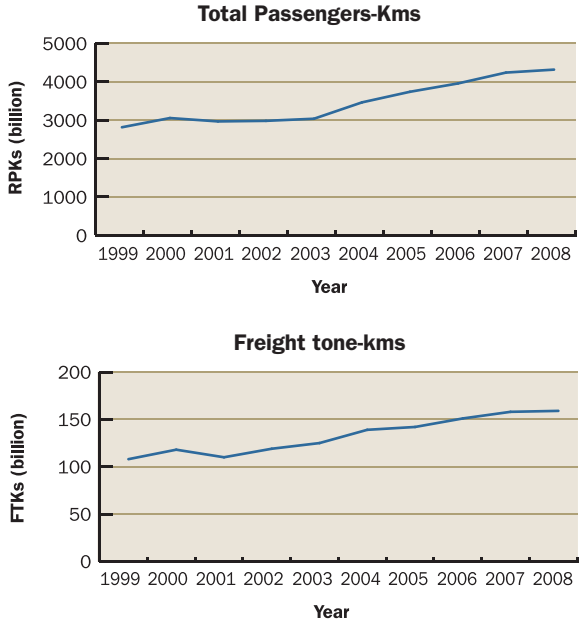
ICAO's medium-term forecasts point to industry recovery during 2010, when global aviation begins to emerge from the tumultuous fuel price and finance factors that have characterised one of the most challenging 12-month periods in the history of aviation.

In this analysis of recent trends and forecasts for the near- and longer-term future, Narjess Teyssier, Chief of the Organization's Economic Analyses and Databases (EAD) Section, outlines the ongoing effects of this century's first significant economic downturn.

Since the end of 2007, the expansion of the world economy has been decelerating and civil aviation has come under extreme pressure from fuel price trends and a lingering credit crunch that has persisted despite massive public cash infusions since September 2008.

ICAO's analysis of passenger traffic results confirms the adverse impact of a slowing economy and lower Gross Domestic Product (GDP) growth on airline traffic around the world. Real GDP at Purchasing Power Parity (PPP)[1] growth significantly decreased from 4.9 percent in 2007 to an estimated 3.6 percent for 2008, impacting traffic across all regions. International traffic was hit particularly hard during this period, but domestic travel markets were also significantly affected.

Figure 1: Passenger and cargo traffic trends—1999 to 2008



According to a consensus among economic forecasters, world economies are currently in the midst of one of the worst recessions in the post war period. Civil aviation, which had earlier been hit hard by a sharp hike in fuel prices, is now facing a drop in passenger and cargo traffic as the credit crisis deepens and recessionary or depressionary fears continue to mount. The 2009 outlook for traffic is poor for the American, European and Asia-Pacific Regions, even if the picture may be more optimistic for the Middle Eastern, African and Latin American Regions.

2008 in review

Preliminary traffic figures for 2008 show a significant drop in passenger and cargo traffic growth.The total scheduled traffic carried by the airlines of the 190 ICAO Member States amounted to approximately 2,291 million passengers and some 42 million tonnes of freight.

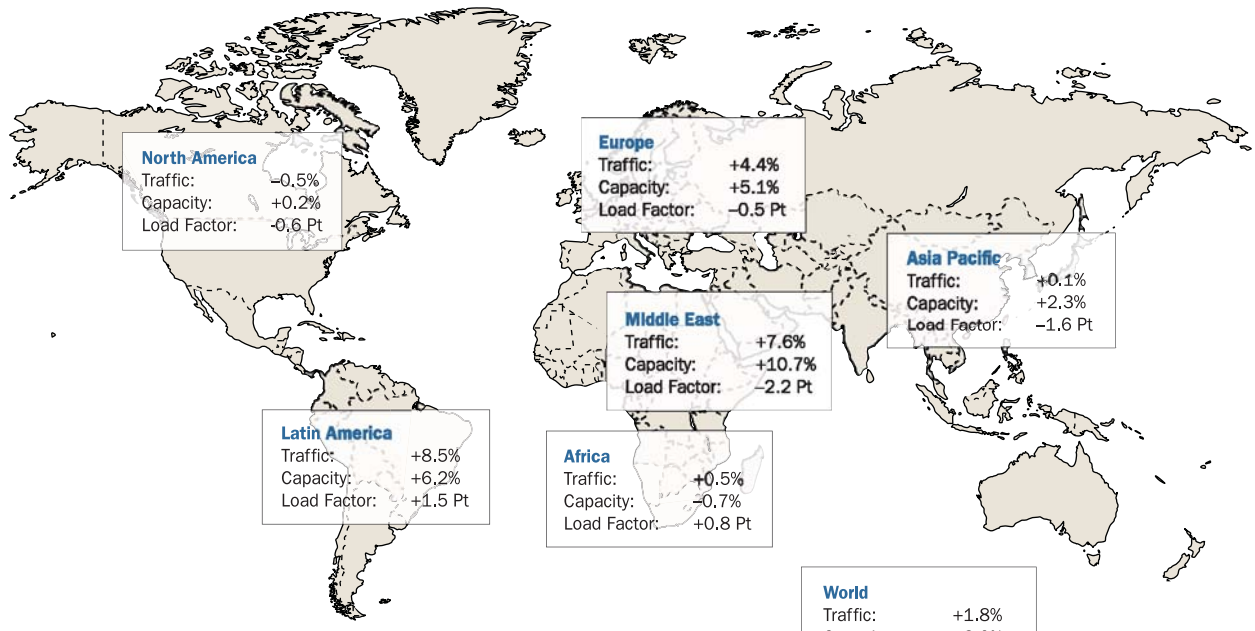
Passengers carried on scheduled air services increased by some 0.8 percent in 2008, with this averaged growth figure having been shared unequally between IATA Member airlines and other types of carriers, notably low-cost carriers. The non-IATA market share increased significantly, reaching 33 percent of domestic scheduled traffic and approximately 20 percent of total scheduled traffic.

A modest passenger traffic growth increase (measured in Passenger Kilometres Performed, or *PKPs*) of approximately 1.8 percent was achieved in 2008 over 2007. This was realised despite fuel prices hitting record levels during the first half of the year as well as the resulting fuel surcharges imposed on passengers to help cushion the aggregate impact of higher fuel costs on the industry at large.

On the cargo side, total scheduled freight traffic (measured in Freight Tonne-Kilometres Performed) grew by only 1.1 percent in 2008, compared to the 4.6 percent growth registered in

[1] Purchasing Power Parity is an economic theory linking currency exchange rates to prices paid for goods and services in any two countries.

Figure 2: Regional passenger traffic overview (% change 2008 vs 2007)



Source: ICAO, IATA, ATA (North America), AEA (Europe), AAPA Int'l (Asia-Pacific), ALTA *2008 H1 estimations

2007. Freight tonnes carried worldwide on scheduled services increased marginally to approximately 41.9 million tonnes compared with 41.4 million tonnes in 2007, while the pace of growth slowed to approximately 1.1 percent from 3.9 percent.

The evolution of passenger and cargo traffic trends from 1999 to 2008 is shown in Figure 1 *(page nine)*. The overall (passenger/freight/mail) Revenue Tonne-Kilometres Performed increased some 1.6 percent over 2007, with international tonne-kilometres at about 3.1 percent.

In terms of total traffic volumes (passengers/freight/mail) broken down by Region, 33 percent was carried by North American airlines, 26 percent by Asia-Pacific airlines, 29 percent by European airlines, 6 percent by Middle East airlines, 4 percent by Latin American and Caribbean airlines, and 2 percent by African airlines.

Seat capacity offered in 2008 grew 3 percent, compared to 5.8 percent in 2007. This was nevertheless higher than the overall traffic increase of 1.8 percent, which resulted in a decline in average passenger load factors on total (domestic and international) services—from 76.7 percent in 2007 to around 75.7 percent in 2008. The overall weight load factor also declined from 63 percent to 62 percent in 2008 due to poor seat utilization and freight carriage.

International passenger traffic

International passenger traffic growth slowed as well, down from 7.6 percent in 2007 to 4.1 percent in 2008, with varying Regional impact. The European Region, which accounts for nearly 41 percent of international traffic, grew by 5.2 percent thanks mainly to the performance of its low-cost carriers.

The Middle Eastern Region, with 8 percent of traffic, grew by 8.9 percent, while Latin America and Africa, which together represent around 7 percent of international traffic, grew by 7.2 percent and 2.1 percent respectively.

The Asia-Pacific region, which accounts for a sizeable 27 percent of international traffic, achieved only near zero growth while the North American Region, representing 17 percent of combined international traffic, registered a substantial growth rate of 5.3 percent.

Domestic passenger traffic

On the domestic front, the impact of a slowing economy and declining GDP had more severe effects on traffic growth. Growth declined from the 6.3 percent achieved in 2007 to -1.6 percent in 2008. North American carriers, which account for almost 58 percent of world domestic traffic, registered a 3.1 per-cent traffic decrease. This significant decline in the world's largest domestic market obviously helped to drag down global percentages as well.

Asia-Pacific domestic carriers, which accounted for approximately 26 percent of domestic traffic worldwide in 2008, grew by only 0.1 percent compared to the astounding 13 percent achieved in 2007. For European carriers, which

TABLE 1: EVOLUTION OF PASSENGER AND CARGO TRAFFIC INDICATORS BETWEEN 2007 AND 2008, FOR INTERNATIONAL AND DOMESTIC SERVICES								
	Pax (mill)	PKP (mill)	PLF %	Frttons (mill)	FTKP (mill)	MTKP (mill)	RTKP (mill)	OLF%
International								
2007	831	2548113	77	25	132100	3220	369400	65
2008	867	2652077	76	26	134100	3260	380900	63
% variance	4.4%	4.1%		1.9%	1.5%	1.2%	3.1%	
Domestic								
2007	1442	1673060	77	16	26100	1320	177300	61
2008	1424	1646376	76	16	25800	1320	174500	60
% variance	-1.2%	-1.6%		0.0%	-1.1%	0.0%	-1.6%	
Total								
2007	2273	4221174	77	41	158200	4540	546700	63
2008	2291	4298453	76	42	159900	4580	555400	62
% variance	0.8%	1.8%		1.1%	1.1%	0.9%	1.6%	

account for 9 percent of world domestic traffic, traffic growth was registered at -1.1 percent, while Latin American carriers, which account for approximately 5 percent of world traffic, grew by a sizeable 10.2 percent during the same period.

Air traffic forecasts

The drivers of air travel demand

In the past thirty years, although growth in world air travel has been greater than global economic growth, analytical studies indicate that there is nonetheless a significant correlation between GDP and traffic PKPs.

Airline passenger demand may therefore be considered as directly related to the state of the worldwide economy, meaning that step changes in the price of fuel impacted both GDP growth and airline ticket prices. Higher food and fuel prices have also had serious macroeconomic effects throughout the global economy, including adverse effects on growth and inflation, and large swings in terms of trade levels.

Most aviation forecasts are based on the premise that air transport demand is determined primarily by economic development and to a lesser extent by seat prices and other factors. ICAO air traffic forecast methodologies are based on econometric models which incorporate expectations of future world economic development, trends in international trade and projections of average fares. As such, GDP is used as a measure of income while airline yield (unit revenue) is used as a measure of price.

Other variables, such as consumer confidence, also have clear effects on demand in certain markets. Consumer confidence indexes are extracted from monthly surveys focusing on individuals' perceptions of their economic situation: wages, prices, unemployment rates, interest rates, and other factors that affect broader consumption patterns. The typically discretionary nature of air travel expenditures, therefore, renders them vulnerable to swings in consumer confidence levels—a pattern reflected very clearly by the sharp decline in travel that accompanied deteriorating general economic conditions in the latter half of 2008, particularly in the North American market.

Real GDP at PPP growth significantly decreased from 4.9 percent in 2007 to an estimated 3.6 percent for 2008, impacting traffic in all regions.

Global GDP growth is expected to decelerate markedly and is likely to reach 1.8 percent in 2009—the lowest level in two decades. Along with rising food costs and falling equity prices, leading to sharp declines in household wealth, the ratio of mortgage debt to disposable income has increased dramatically, also leading to reductions in disposable income.

Consumer spending adjusted for inflation is therefore flattening, and the share of spending on non-durable goods is rising at the expense of other categories, namely discretionary expenditures which includes air travel. Although oil prices are retreating as the economy weakens, the ongoing financial crisis and credit crunch will create major headwinds for civil aviation growth.

TABLE 2: 2008 REGIONAL* MARKET SHARE FOR PASSENGER AND CARGO TRAFFIC

	Passengers carried	PKP	FTKP	TKP
INTERNATIONAL AND DOMESTIC				
EUR	3.3%	4.4%	-1.0%	3.0%
AFR	-2.7%	0.5%	-3.4%	0.3%
ME	4.0%	7.6%	14.1%	10.1%
AP	0.1%	0.1%	-0.2%	-0.2%
NA	-2.0%	-0.5%	1.8%	0.0%
LA	9.4%	8.5%	1.6%	6.4%
WORLD	0.8%	1.8%	1.1%	1.6%
INTERNATIONAL				
EUR	5.2%	5.2%	-1.0%	3.5%
AFR	2.1%	2.1%	-3.3%	1.7%
ME	8.9%	8.9%	14.3%	11.1%
AP	0.0%	0.0%	-0.7%	-0.4%
NA	5.3%	5.3%	5.7%	5.1%
LA	7.2%	7.2%	-1.5%	3.9%
WORLD	4.4%	4.1%	1.5%	3.1%

Oil price evolution and its impact on airline jet fuel costs

In 2007, even under the most pessimistic scenarios, oil prices were not expected to go beyond $90/b in the medium-term (2007-2012). The fuel share of the total operating costs for a typical network airline was around 25 percent during this period, corresponding to an average oil price of $65/b and a relatively stable yield evolution between 2000 and 2006, as expressed in real terms.

The huge swings in oil prices over the past year highlight the inherent risks in this market, making it extremely difficult to forecast. Energy specialists believe that oil prices will average around $50/b in 2009, and then rise to $80 in 2011 before approaching the psychological barrier of $100/b again only in 2013.

According to Global Insight, potential global risks encompass a wide range of outcome and supply problems that could send prices up to $100/b sooner than 2013, inflicting even further damage on the world economy. In contrast, should the global recession become more severe than currently anticipated, deflation and other factors could lead to a build-up in inventories that may push the price of oil down to $25/b in 2009.

Oil prices therefore remain difficult to predict. Taking into account the current financial crisis as well as some balancing between supply and demand, it is assumed by many economic forecasters that yearly averages of oil prices in 2009 and 2010 will be significantly below the 2008 average level.

While a great deal of economic focus remains on oil price evolution, the real cost to airlines in terms of the price being paid for jet fuel is substantially higher. The price of jet fuel is comprised of the price of crude oil added to the required refining margin, known as the *crack spread.* In the first half of 2008, jet fuel price levels translated into a dramatic increase in operating costs for all types of carriers and operators, representing some 30 to 35 percent of total operating costs. This obliged airlines to apply fuel and baggage surcharges to their ticket prices.

Traffic outlook for 2009

The latest ICAO medium-term traffic forecast reflects Global Insight's projected growth performance (real GDP at PPP) of the world economy over the next two years, with slowdowns to 3.6 percent and 1.8 percent respectively in 2008 and 2009, and a recovery in 2010 at 3.4 percent.

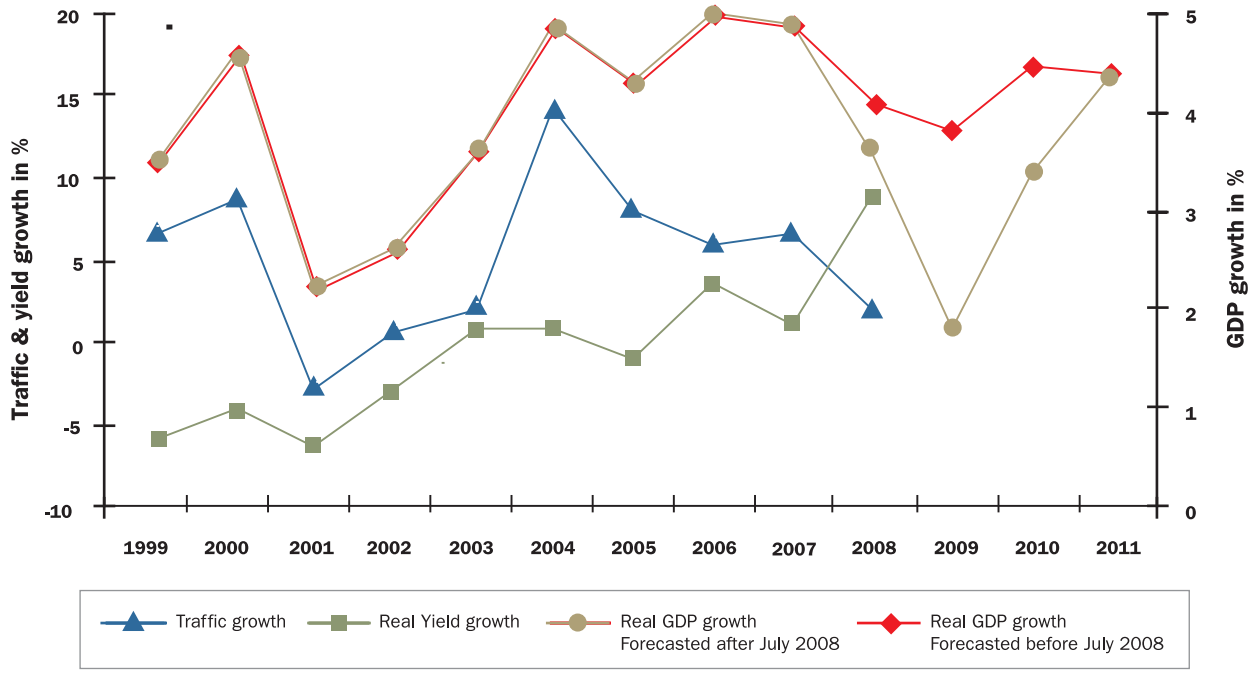
In line with these latest GDP forecasts, growth in airline passenger traffic, expressed in year-on-year percentage change in PKPs, is expected to decelerate markedly in 2009 to 0.9 percent, and recover with an increase of 5.1 percent in 2010.

Average passenger load factors are expected to decline accordingly, hovering around 76 percent in 2008 and 2009 before returning to 2007 levels in 2010. It is noteworthy that these projections remain vulnerable to any further decreases in the projected GDP growth rates.

From a more Regional standpoint, the traffic outlook remains poor for North America while more robust performance rates are expected for the Middle Eastern, African and Latin American Regions.

*By airlines registered in each region.

Figure 3: Correlations between GDP and traffic and yield growth rates



On a more positive note, the significant and recent oil price decreases may yet drive some momentum in traffic growth—especially in highly elastic markets. Certain market participants, such as low-cost carriers, may experience growth similar to that which they enjoyed following the 2001 crisis.

Financial overview

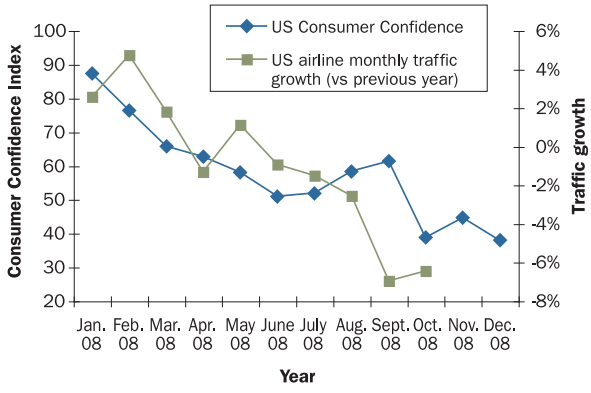
Financial baseline: consolidated data for 2007

Reflecting the growth momentum of the global economy, 2007 consolidated traffic figures for the scheduled airlines of ICAO Member States showed a strong increase of 7.1 percent compared to 2006 levels for total (domestic and international) passenger traffic in terms of Passenger-Kilometres Performed, and 4.6 percent growth for the air freight traffic expressed in Freight Tonne-Kilometres Performed.

In line with this high traffic growth, financial results for 2007 were exceptional, showing record levels of operating profit ($20 billion compared to $15 billion in 2006). Operating margins increased significantly from 3.2 percent in 2006 to 3.9 percent in 2007, and after adjusting for non-operating items (mainly interest on borrowings) the net profit of the world's carriers, including the profits of affiliated companies, soared to a record level of approximately $14.5 billion. This corresponds to an improvement in net margins from 1.1 percent in 2006 to 2.9 percent in 2007.

Several factors contributed to these positive financial results, including improved load factors and efficient variable cost management—resulting in lower break-even points. The strong demand for air travel allowed airlines to raise their fares, generating a net yield increase representing approximately $1 billion of the $5 billion net improvement compared to 2006's results. Traffic came in higher than the seat capacity growth of 5.8 percent, accounting for an additional $3 billion of the 2007 increase. Gains on exchange rates of some currencies vs. the US dollar accounted for the remaining $1 billion improvement compared to 2006's results.

Figure 4: Consumer confidence



Scheduled air carriers' net profit from core airline activities (not taking into account non-airline business revenues) is estimated at $12.9 billion for 2007, or 2.5 percent of their operating revenues.

Medium-term financial forecast

Financially, airlines of the ICAO Member States are expected to register an operating loss of about $2.7 billion for 2008, before regaining operating profitability in 2009 and 2010 based on estimated operating profits of $3.8 and $6.7 billion, respectively. The expected operating loss for 2008 would result despite measures such as fuel surcharges and capacity adjustments that were intended to counterbalance the huge increase in fuel prices registered during the first half of 2008.

Some regional disparities are expected, however, and the North American market will likely be the most adversely affected. This is due to the fact that some European and Asian carriers enjoy an advantage when purchasing dollar-denominated commodities such as jet fuel, owing to the fact that they collect revenues in currencies that are at a premium rate compared to the US dollar.

Challenges for civil aviation development

Civil aviation is a value chain industry reflecting interdependencies whereby the failure of any given stakeholder can lead to a domino effect on the others. The most vulnerable of these are the airlines, who in 2008 were hit first by high fuel costs impacting their operating expenses and then by the global financial crisis which has made financing for new planes and fuel hedging strategies increasingly difficult to pursue.

TABLE 3: OPERATING AND NET RESULTS[1] (SCHEDULED AIRLINES OF ICAO CONTRACTING STATES[2])

	OPERATING RESULT				NET RESULT[3]			
Year	Operating Revenues U.S.$ (millions)	Operating Expenses U.S.$ (millions)	Amount U.S.$ (millions)	Percentage of operating revenues	Amount U.S.$ (millions)	Percentage of operating revenues	Direct subsidies U.S.$ (millions)	Income taxes U.S.$ (millions)
1999	305,500	293,200	12,300	4.0	8,500	2.8	10	-4,300
2000	328,500	317,800	10,700	3.3	3,700	1.1	10	-2,750
2001	307,500	319,300	-11,800	-3.8	-13,000	-4.2	10	3,610
2002	306,000	310,900	-4,900	-1.6	-11,300	-3.7	10	2,300
2003	321,800	323,300	-1,500	-0.5	-7,560	-2.3	10	-1,460
2004	378,800	375,500	3,300	0.9	-5,570	-1.5	10	-2,460
2005	413,300	409,000	4,300	1.0	-4,100	-1.0		-2,800
2006[4]	465,160	450,200	14,960	3.2	4,990	1.1		-3,300
2007[5]	507,870	488,220	19,650	3.9	14,530	2.9		n/a

[1] Revenues and expenses are estimated for non-reporting airlines.
[2] Up to and including 1997 it excludes operations within the Commonwealth of Independent States.
[3] The net result is derived from the operating result by adding (with plus or minus sign as appropiate) non-operating items (such as interest and direct subsidies) and income tax. The operating and net results quoted, particularly the net results, are the small differences between the estimates of large figures (revenues and expenses) and are therefore susceptible to substantial uncertainties.
[4] The net results for 2006 have been estimated after excluding reorganization expense provisons made by some US carriers. The same will be considered after the actual impact of reorganization is known and the the provisions substantialy reversed by the Carriers in subsequent financial years.
[5] If we exclude non core items the net profit for the World Scheduled airlines will be estimated at US 3.5 billion and USD 12.9 billion respectively for 2006 and 2007.
Source: ICAO Air Transport Reporting Form EF plus ICAO estimates for non-reporting States

TABLE 4: REAL GDP GROWTH AT PPP*					
	Average Annual Growth (%) 1997-2007	Actual 2007	Preliminary 2008	Forecast 2009	2010
Africa	4.4	5.8	5.7	4.5	5.1
Asia-Pacific	5.4	7.4	5.6	4.3	5.5
Europe	2.7	3.2	1.6	-0.1	1.4
Latin America / Caribbean	3.1	5.5	3.9	2.1	3.2
Middle East	4.8	5.5	6.0	3.0	3.8
North America	2.9	2.1	1.3	-0.9	1.8
World	3.9	4.9	3.6	1.8	3.4

Source: Global Insight *PPP: Purchasing Power Parity is an economic theory linking currency exchange rates to prices paid for goods and services in any two countries.

Airline strategies in a period of crisis

In order to cope with the global economic crisis now affecting both passenger and air cargo traffic, some airlines have begun grounding planes, cutting capacity and delaying or cancelling orders for new aircraft. A significant number of bankruptcies have also been reported, primarily in North America. The total number of scheduled carriers in service has decreased from 848 in 2007 to 823 at the end of 2008, and the ongoing effect of further mergers, acquisitions and additional operational integrations will strengthen this trend in 2009.

In addition to the fuel surcharges, carriers have also been employing strategies to improve fuel and operational efficiency. 2008-2009 will witness a significant rise in the number of biofuel tests being conducted by major carriers in close cooperation with aircraft and engine manufacturers.

Regarding capacity effects, a trend similar to the one observed some years ago is now emerging, characterised not only by smaller fleet sizes as older aircraft types are retired (though not replaced due to a lack of cash-flow and contracted credit markets), but also flight frequency and route reductions. Aircraft seat capacity, as measured in Available Seat-Kilometres (ASKs) is forecast to grow by only 0.6 percent in 2009.

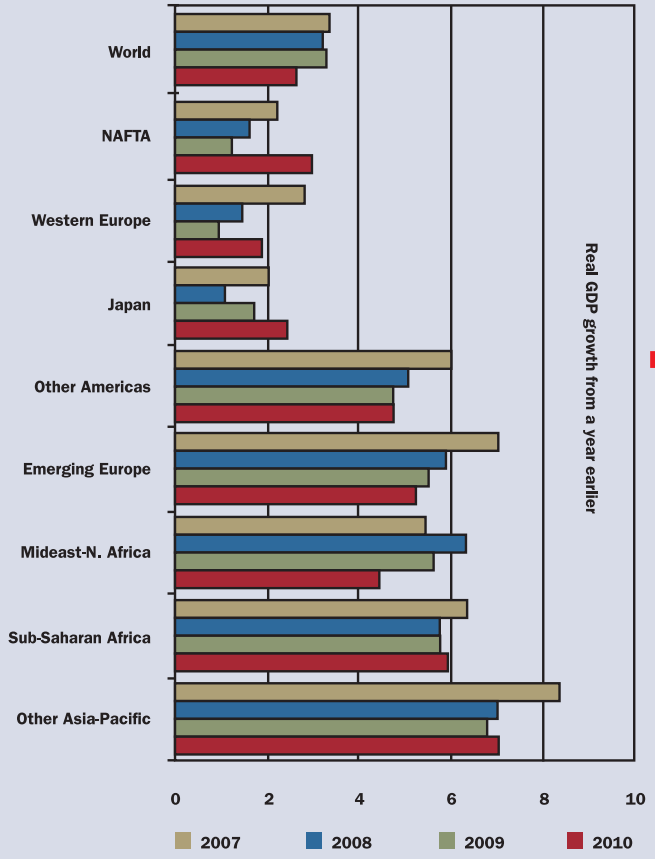
In addition, 2008's oil price volatility has also had a severe impact on the airlines' ability to benefit from hedging their fuel costs. Where cash flow permits, certain airlines have been able to "hedge" or effectively lock-in lower jet fuel prices to help offset market volatility. When $200/b oil price projections began to be published in mid-2008, many airlines locked themselves in to fuel price structures reflecting spot oil prices which, though less than $200, were still comparable to mid-2008 levels. When prices plummeted to their current levels, these strategic attempts at cost savings actually evolved into significant operating losses for affected carriers.

Plummeting oil prices have once again made labour costs the most important concern for airline profitability, with the result that significant lay-offs are planned for the near future. This will augment other capacity cuts and the liquidation of weaker carriers as already discussed. An indirect but similar impact is expected for civil aviation stakeholders, including airports, air navigation services providers, airport security companies and aircraft manufacturers.

Prices for energy + food + the financial crisis = a worrying combination for air travel

Almost every region is slowing
(Real GDP, percent change)

No rebound expected in world growth until 2010.
Too early to identify the full added impact of the financial crisis.

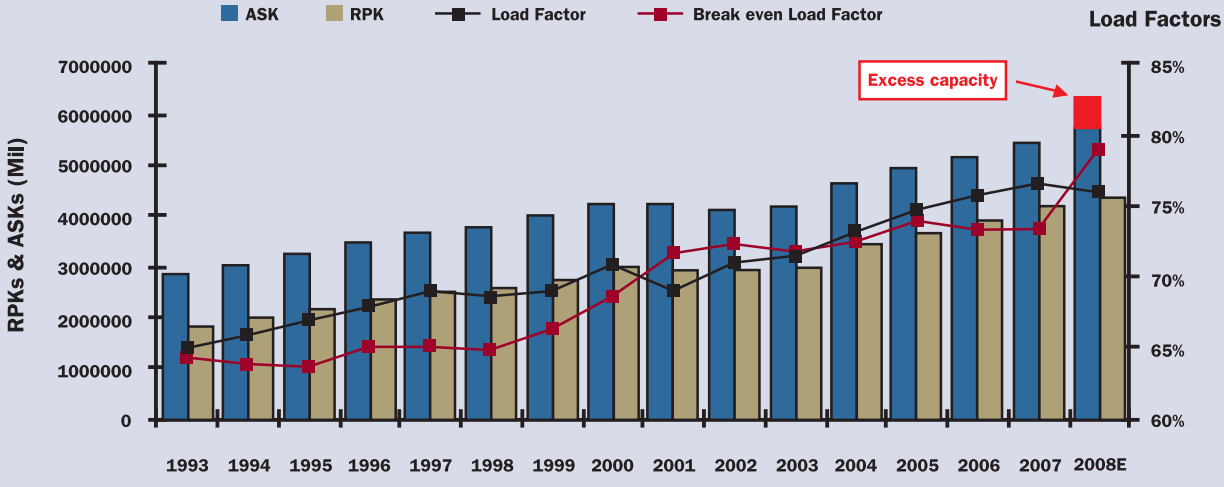


Foreseen impacts for air travel

- Consumer spending is flattening, affecting air travel expenses and hence air travel demand.
- Decline in business trips, affecting airlines profitability.
- Financing problems for the air transport industry—notably for aircraft purchases and fuel hedging.

Source: Global Insight, 3rd quarter 2008 forecasts

Looming capacity decreases



The oil price break even point for airlines is at $110/b, despite a decreasing trend in non-fuel costs reaching their limit. This could impact the whole air transport industry profitability system.

Source: ICAO

Aircraft manufacturers

Aircraft manufacturers, though generally in better shape than other industry stakeholders, have not been immune to the effects of the global recession. Certain airlines have cancelled their orders or delayed their deliveries due to a lack of cash flow, and even relatively strong carriers are choosing not to exercise options to buy planes and are cancelling aircraft-lease agreements.

The number of parked jets worldwide has risen in 2008 from 2764 to 2859 stored aircraft, initially because these aging models used more fuel but more recently due simply to decreasing passenger demand.

In addition, further airline mergers will raise questions about the future of certain aircraft orders. A newly-merged airline inevitably seeks out all possible efficiencies and economies of scale—including the ability to operate with fewer jets. During 2008, the number of new jet aircraft orders received by the two biggest aircraft manufacturers has declined and, even if their global orders do exceed 1,300 aircraft as expected, this number is still well below the record 2376 orders received by them in 2007.

Aircraft deliveries, meanwhile, continued at their regular pace, with over 850 deliveries in 2008 and a similar number planned in 2009 and 2010. These latter figures may be diminished somewhat by effects from the Boeing machinists strike.

It should be noted, however, that both Boeing and Airbus have huge backlogs corresponding to the equivalent of about six years worth of production. This factor should cushion them and their supplier bases from cancellations and any other drop-offs in new orders over the short-term.

Figure 5: Fuel price evolution

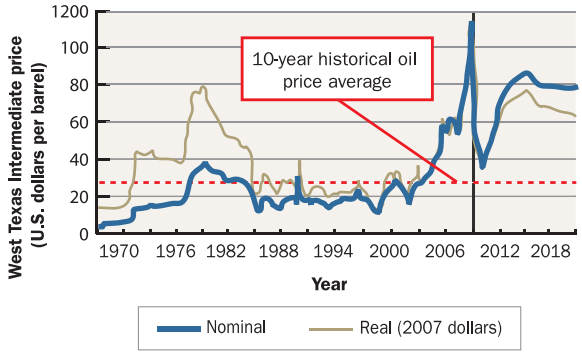


TABLE 5: REGIONAL GROWTH IN PASSENGER KILOMETRES PERFORMED (PKPs) – PERCENTAGE CHANGE OVER PREVIOUS YEAR			
Region	2008 Preliminary	2009 Forecast	2010 Forecast
Africa	0.5	1.0	7.6
Asia/Pacific	0.1	1.0	7.0
Europe	4.4	2.2	4.9
Middle East	7.6	5.3	7.5
North America	-0.5	-1.2	2.8
Latin America / Caribbean	8.5	3.1	7.0
World	1.8	0.9	5.1

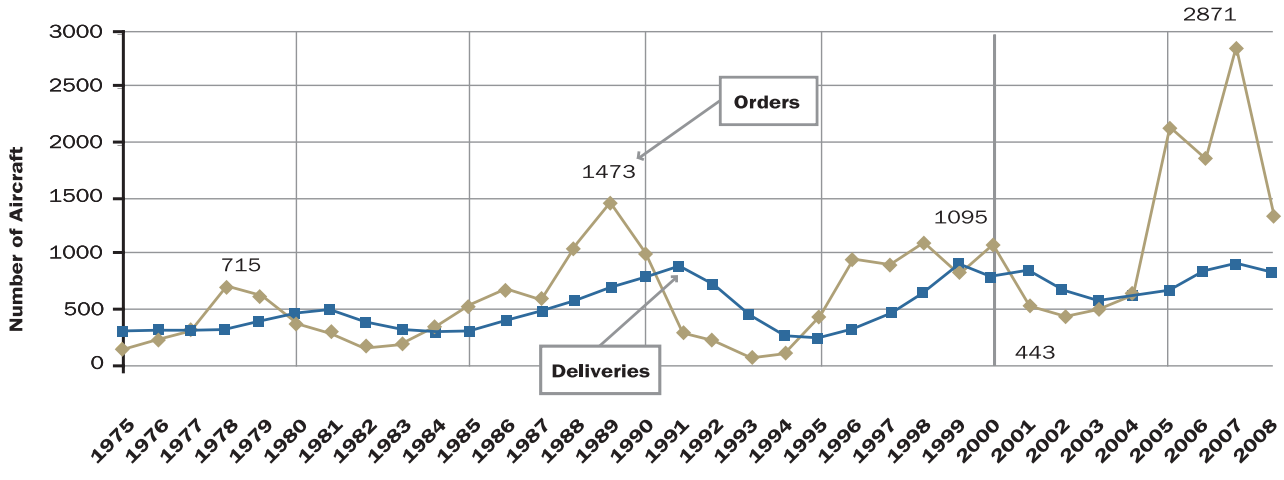
Conclusion

In addition to the 2007-2012 Strategic Objectives that ICAO is currently implementing to support the operational aspects of air transport, linked notably to Safety, Security and Environment, the Organization has identified the need to develop economic policies that reflect today's difficult realities and provide a judicious balance between a liberalised economic regulatory framework and the maintenance of appropriate social and labour standards.

In the short-term, the ongoing world recession will obviously impact air transport growth, as the leisure traveller will have less or no cash to spend on holiday voyages and the business traveller will likely migrate to alternative means of conducting business wherever possible.

Looking ahead, the challenges for all civil aviation stakeholders will rest in managing the risks associated with the potentially adverse impact on traffic growth that may result from the current economic crisis, ensuring for the long-term the continuous and sustainable development of civil aviation to the inarguable benefit of all markets and economies—both local and global in nature. ■

Figure 6: Orders and deliveries of Boeing, Airbus & McDonnell-Douglas, 1975-2007



Innovative ICAO Conference facilitates Air Services Negotiations between States to enhance efficiency

The first ICAO Air Services Negotiation Conference (ICAN 2008), held in Dubai from November 24-27 2008, brought together air service negotiators representing 27 States from the African, Asia-Pacific, European, Middle Eastern and North American Regions for bilateral talks relating to their respective air service agreements. The event, which also attracted two international organizations, was hosted by the Dubai Civil Aviation Authority with the support of the Federal Government of the United Arab Emirates (UAE).

This was the first such event to be organized by ICAO and it was designed to provide a central meeting or "marketplace" where government negotiators could meet and hold separate bilateral air service talks in a multilateral setting. Traditionally, each State would have to travel to each of its bilateral partner States to conduct such meetings.

By enabling each participating State to hold multiple negotiations at the same location, the Conference greatly improved the efficiency and effectiveness of the overall negotiation process. The ICAO Secretariat first put forward the "marketplace" concept during the Fifth Worldwide Air Transport Conference (ATConf/5) in 2003—as a means to assist States with the liberalization process. The Conference's results clearly demonstrate that it has achieved its objectives.

"This is an historic event in that it is the first time since the introduction of the bilateral system for international air transport regulation that these many States have gathered in one place to conduct their respective bilateral air service negotiations," stated the President of the ICAO Council, Roberto Kobeh González. "ICAO is best positioned to facilitate this process, and is proud to have brought this event to fruition. The Organization will continue to serve our Contracting States in a practical, effective, efficient and innovative way, as exemplified by ICAN2008."

During the three days of ICAN2008, more than 100 formal and informal bilateral meetings were held (an average of 5 meetings for each delegation), and over 20 bilateral air service agreements or arrangements were concluded or signed. While some negotiations have yielded agreements, many other talks have helped open future opportunities for developing better aviation relations and air links between States.

The UAE's Director General for Dubai's Civil Aviation Authority, Mohammed Ahli (left), seen here with ICAO Air Transport Bureau Director, Folasade Odutola. Al Mansoori congratulated Ms. Odutola's Bureau for developing the concept of the ICAN Conference
and helping to make it such a successful reality.

The Conference also provided a forum, through its seminar session, for participants to exchange information and views on current trends and issues in liberalization and learn about related ICAO guidance. The delegates highly commended ICAO for this innovative initiative and indicated their strong support for future events of this kind.

"ICAO's efforts have provided a convenient platform to facilitate countries like Singapore in pursuing for the liberalization of air services," noted Lim Kim Choon, Director General and CEO of the Civil Aviation Authority of Singapore. His country signed two separate open skies agreements with Romania and Zambia at the ICAN event.

Lim's remarks were echoed by UAE Minister of the Economy, Sultan bin Saeed Al Mansoori. "This has truly been a conference with a difference," Al Mansoori commented. "I wish to congratulate the ICAO Air Transport Bureau for developing this idea and helping to make it such a successful reality." ■

US stakeholders demonstrate new weather advisory information integration

New tools to facilitate better air traffic control, reducing delays and fuel consumption

Embry-Riddle Aeronautical University (ERAU) recently completed its demonstration to the Federal Aviation Administration (FAA) of its progress in developing air traffic control tools capable of reducing weather-related flight delays, reducing aircraft fuel consumption, and improving the efficiency of flight operations.

Along with research partners Lockheed Martin, Computer Sciences Corp., Boeing, ENSCO, and Mosaic ATM, ERAU demonstrated how current and forecasted weather information can be successfully integrated into the FAA's traffic management and en route automation systems, located in FAA centers and major airports around the country.

The demonstration was held at Embry-Riddle's NextGen testing facility at Daytona Beach International Airport on November 18, and highlighted what could be a cornerstone system enhancement and critical next step in the FAA's Next Generation Air Transportation System (NextGen). This and other NextGen tools are expected to be needed in order to safely accommodate the growing number of U.S. air travelers, estimated to hit one billion by 2016.

"The key to realising the benefits of NextGen is to have all systems talking to one another and integrated under a system wide information management system," said Dr. Christina Frederick-Recascino, Embry-Riddle's vice president for research. "This demonstration showed the FAA that this particular integration is feasible, practical, and beneficial."

The demonstration revealed that by integrating weather with traffic information throughout the national airspace system controllers could be enabled to reroute aircraft efficiently and quickly around thunderstorms and other forecasted severe weather.

New weather forecast products were transmitted to the computers of D-position controllers, enabling the controllers to probe flights to identify weather incursions. The D-position controllers then used a new rerouting capability to point-and-click aircraft around the predicted severe weather to generate new flight plans and efficiently schedule aircraft at their arrival destinations.

Olli Marius Turpeinen, Chief of ICAO's MET/AIM Section, noted that this development is fully in line with the goals of ICAO to more deeply integrate meteorological information into all decisions related to air traffic management and that similar approaches are being taken by EUROCONTROL under the auspices of the SESAR programme.

"The real challenge this presents for ICAO is to ensure the interoperability of the various systems being developed," Turpeinen commented.

By sharing information throughout the national airspace and giving controllers the ability to reroute air traffic smoothly long before it reaches bad weather, the new North American system will result in fewer disruptions and delays in the air and at airports. Travelers will have shorter waits and jetliners will burn less fuel.

Embry-Riddle is working with the NextGen program office to test new technologies and enhance existing ones to advance the FAA's NextGen vision by giving leading industry and research partners the ability to model these capabilities in a real airport environment —such as the Daytona Beach testing facility. Program participants also included Barco, Frequentis, Harris Corp., Jeppesen, Sensis, Transtech, and the Volpe Center. ■

> **" This initiative is fully in line with the goals of ICAO to more deeply integrate meteorological information into all decisions related to air traffic management.**
>
> **The real challenge this presents for the Organization is to ensure the interoperability of this and similar systems now under development."**
>
> **– Olli Marius Turpeinen, Chief, ICAO MET/AIM Section**

Aircraft emissions and climate change

Charting the effects of non-CO_2 multipliers

A number of processes act on aircraft emissions leading to changes in radiative forcing of climate. Blandine Ferrier, Junior Professional Officer, ICAO Environment Unit, recently discussed the nature and effects of non-CO_2 multipliers and their implications for determinations of aviation climate impact with David W. Fahey of the NOAA Earth Science Research Laboratory.

Blandine Ferrier, ICAO Environment Unit: What it the objective in employing non-CO_2 multipliers when measuring aviation's contribution to climate change?

David Fahey: A non-CO_2 multiplier for aviation is used to simplify the quantification of that transportation sector's contribution to climate change. Global aviation operations emit a variety of gases and particles into the atmosphere and change Earth's cloudiness. These effects derive from aircraft combustion of fossil fuel primarily at cruise altitudes. The connections between aircraft emissions and climate change/climate change impacts are shown schematically in Figure 1 *(page 24, top)*. A number of processes act on aircraft emissions leading to changes in radiative forcing of climate. Radiative forcing is a quantitative measure used by scientists to indicate how strongly the climate system is being pushed away from its natural state by human activities.

A large fraction of CO_2 aviation emissions remain in the atmosphere after accounting for uptake by oceans and the biosphere. Reactive nitrogen (NO_x) emissions lead to decreases in methane (CH_4) and increases in ozone (O_3) through chemical processes in the atmosphere. Water vapour emissions at cruise altitudes accumulate in the stratosphere. Collectively, the emissions of water vapour, hydrocarbons (HC), sulfur (SO_x) and soot lead to the production and accumulation of small particles (aerosol) in the atmosphere, the formation of contrails and changes in background cloudiness. All of these changes lead to changes in radiative forcing. Some forcing changes are negative (CH_4, sulphate aerosol), which leads to a cooling of the climate, and some changes are positive (CO_2, O_3, contrails, clouds, soot), which leads to a warming of the climate.

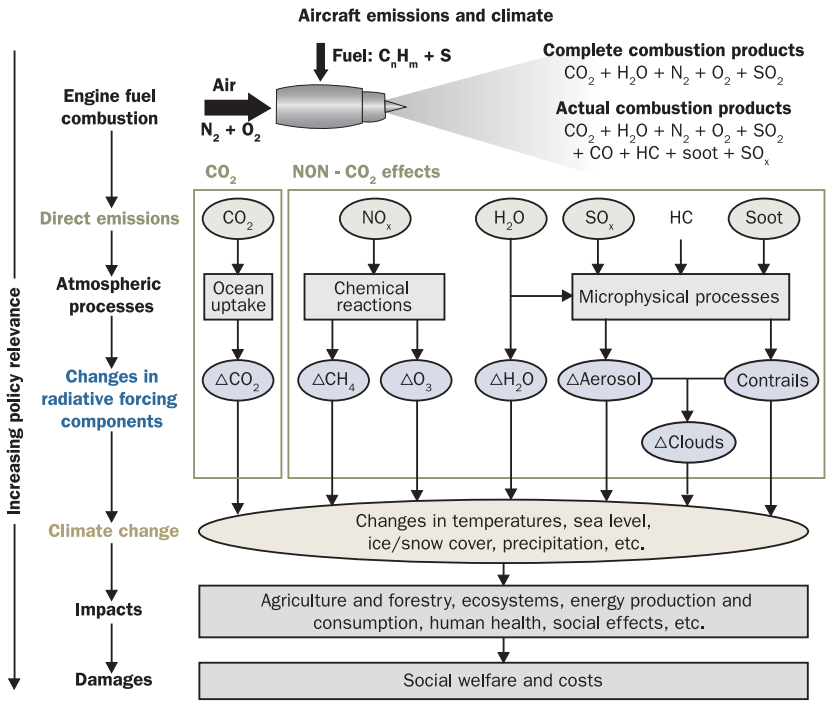
As originally introduced, the non-CO_2 multiplier was a ratio of the total radiative forcing of all aviation effects listed above to that from CO_2 only, as evaluated from pre-industrial times to the present. The principal value of the multiplier is that, if it can be assumed constant with time, it allows total aviation climate forcing to be simply calculated from CO_2 emissions alone. CO_2 emissions from the burning of aviation fuel and the CO_2 climate effect in the atmosphere are well known. In contrast, significantly more uncertainty is associated with the understanding and calculations of the non-CO_2 effects.

What climate metrics are most relevant to measure the non-CO_2 effects?

The climate metrics that are currently most applicable to aviation are radiative forcing, the Global Warming Potential (GWP) and the Global Temperature Potential (GTP). When computing the non-CO_2 multiplier, a common measure or *metric* of climate impact must be chosen to evaluate each of the separate aviation effects. Radiative forcing from pre-industrial times to the present day is the original and most commonly cited metric for the multiplier. Radiative forcing is a *backward looking* metric because it is proportional to the accumulated effect of global aviation over the industrial era. In the future, changes in aviation operations will likely alter the relative magnitude of aviation effects. For example, the frequency of contrails could change with increases in engine efficiency or adjustments to aircraft altitudes and/or routing. Thus, the multiplier is unlikely to remain constant as aviation operations evolve. As a consequence, a present-day multiplier using the radiative forcing metric cannot be used with confidence to calculate the future contribution of aviation to climate change.

The GWP is an alternate metric for the multiplier that is *forward looking*. The GWP of an aviation effect is the integrated or year—by year total of the associated radiative forcing. A period of 20, 50 or 100 years is commonly chosen

Figure 1: Schematic of the connections between aviation emissions, associated radiative forcings and climate effects.



as the calculation period. The radiative forcing of each component is linked to prescribed aviation scenarios (defining future aircraft, routing, traffic, etc.) that are used to determine the magnitude of each component forcing over the period. The relative climate impact of future aviation scenarios can then be evaluated, for example, by comparing the associated 100-yr GWPs. A limitation of the GWP as a metric is that some aviation effects are short-lived (contrails, aerosols, etc.) and others are long-lived (CO_2). As a consequence, comparisons of the 100-yr GWPs may not accurately represent differences in the *response* of climate to different aviation scenarios.

The GTP is another forward-looking metric used in a very similar manner to the GWP. Instead of radiative forcing, the GTP uses future *surface temperature* evaluated at a time 20, 50 or 100 years in the future. Changes in temperature are a principal *response* of the climate system to radiative forcing. The GTP has the same limitation as the GWP; namely, that it may not accurately represent differences in the response of climate to different aviation scenarios.

In the use of these or other alternate metrics for the evaluation of future climate forcing, accurate scenarios of future aviation operations are essential.

Is aviation the only sector that should be using a multiplier?

Other sectors that create radiative forcing of climate change may also benefit from the concept of a multiplier for non-CO_2 effects. The multiplier concept could also help simplify the quantification and the presentation of the climate impacts of non-aviation sectors. Other sectors generally will have non-CO_2 effects and these effects also may have larger uncertainties associated with the calculations of their associated radiative forcings. However, the limitations that apply to using radiative forcing, GWP and GTP as multiplier metrics for aviation are likely also to be a concern in their use with other sectors.

Using the same metric for climate change evaluations across sectors would have the advantage of simplicity for both scientists and policymakers. For scientists, a single metric would allow common evaluation approaches to be used across sectors, while for policymakers a single metric would simplify the comparison of climate change effects for different sectors.

Do you know of any examples of non-CO_2 multipliers in other economic sectors?

No, I am not familiar with the use of non-CO_2 multipliers in other economic sectors. However, scientists have made similar radiative forcing calculations for the component effects associated with the shipping and land based transportation sectors. The application of a multiplier would be similar for these sectors and have comparable limitations as discussed above.

Have there been any new findings since the most recent IPCC Special Report in this area?

Yes, considerable work has been undertaken to evaluate the climate effects of aviation since the 1999 IPCC Special Report: *Aviation and the Global Atmosphere*. The magnitudes of the separate forcing terms for aviation have been updated in a number of modeling studies. Significant changes have occurred, for example, with contrail radiative forcing (which has decreased from the IPCC 1999 value) and with induced cirrus radiative forcing. The revised value follows from several studies using models and observations to improve the parameterization within models of aviation cloud effects. These studies have refined the use of the non-CO_2 multiplier and improved our understanding of its uncertainties for the current and future aviation fleet. ■

The potential of airports to support CAEP objectives

Emanuel Fleuti, Head of Environmental Services, Zurich Airport, Switzerland

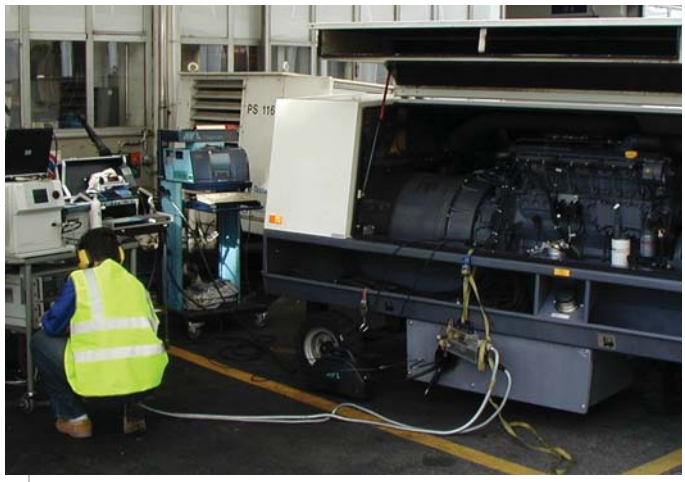
Society's demand for air travel is further increasing, but so are the resulting environmental impacts in many regions in the world. Today, coordinated efforts by all industry stakeholders and States are needed to mitigate the adverse effects of aviation. Airports, potentially becoming the bottlenecks for further development of aviation, can participate considerably in supporting the ICAO Council's Committee on Aviation Environmental Protection (CAEP), and Zurich airport has taken a leading role with its initiatives to better address airport air quality issues.

Contrary to airlines, airports are operating in a very static, local and tangible environment. They are subject to local or national legislation influenced to a significant degree by the public and political perceptions in a given facility's environs. Such legislation can impact the way airports are able to operate and develop in the future and, in particular, environmental legislation responding to actual and perceived impacts can lead airports into bottleneck situations where air traffic growth is constrained or disabled. Despite the global nature of aviation and the need for harmonised programs, the localised reality of airport operations means that these facilities represent aviation's front line when it comes to environmental issues.

Zurich airport was tasked in 1989 to produce an environmental report detailing where it stood at that point in time while also accounting for projected environmental impacts through to 2010. The report revealed air quality compliance problems, limited technical data on specific emission sources, a relatively limited understanding of operational procedures and various gaps in international harmonisation. It also confirmed the need for cooperation among aviation's stakeholders with respect to the development and exchange of the relevant expertise.

These findings and others were considered reason enough for Zurich airport to begin participating in international air quality discussions.

The main objectives for Zurich airport were to develop a comprehensive system understanding, internationally accepted databases and agreed procedures for air quality assessments. This approach has been essential to gain acceptance and credibility from both local and national authorities. It was also considered important that Zurich airport—in line with many other airports worldwide—should seek and maintain its own environmental expertise.



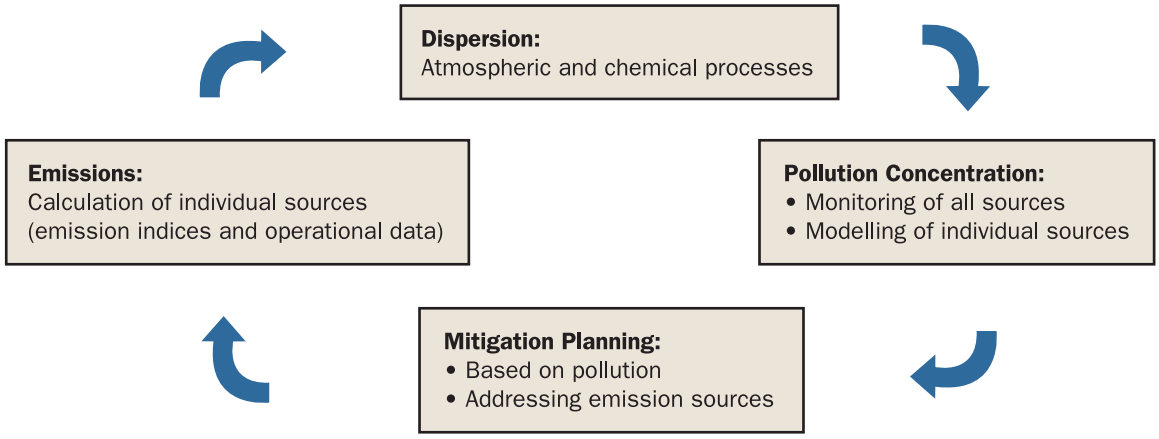
GPU Engine Exhaust Measurements

System approach envisaged

The main elements of a local air quality assessment are shown in Figure 1, below. The emission inventory includes all relevant airport sources and emission types over a given time period. This requires detailed knowledge of operational procedures as well as specific emission information. Such an inventory reveals relevant sources and pollutants and provides indications for how to establish future priorities.

The determination of the pollution concentrations can be done twofold. Ambient concentration measurements will show the total pollution. However, to obtain the source attribution, dispersion modelling is needed. Based on all available information, mitigation plans can then be planned and implemented that are both effective and efficient.

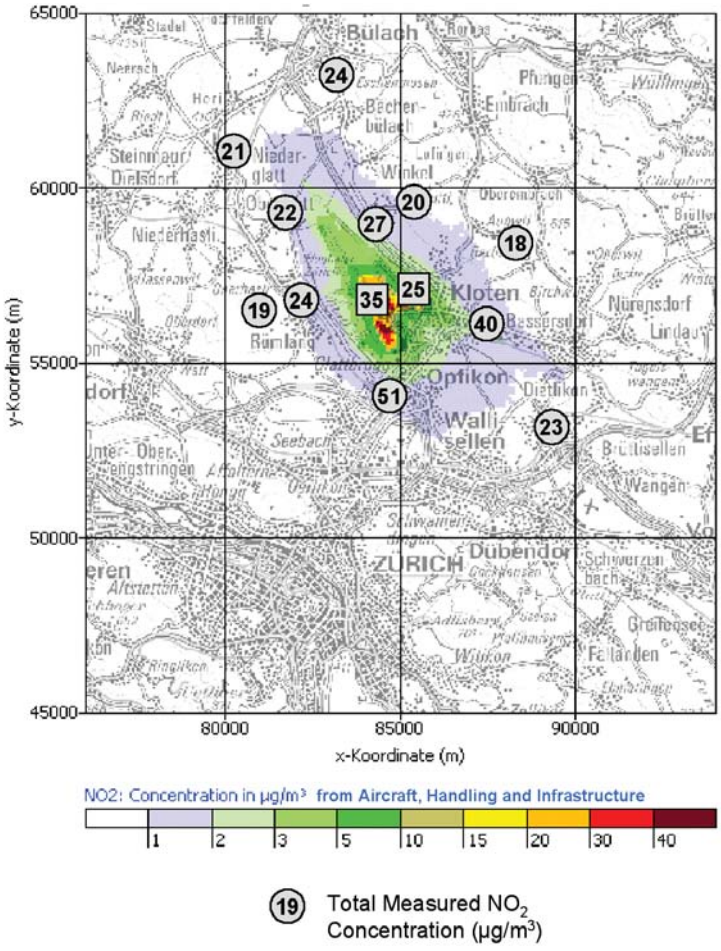
Figure 1: Local air quality elements



Various international research and industry programs have demonstrated the mutual benefits achieved when airports share their expertise with manufacturers and regulators. Zurich airport's participation in AERONET, the European Air Quality Research Information Platform, as well as in the preparation of the 1992 IPCC Special Report on Aviation and the Global Atmosphere, have further specified some detailed needs for system related studies and the potential airports have to contribute to the global picture. It goes without saying that Zurich airport has always intended to share results and findings with the global aviation community.

In the environmental context, local air quality has always been a top priority for Zurich airport and most of the work undertaken has been dedicated to this issue. Based on the needs of the ongoing legislative process, the industry's development and the airport's commitments, a number of studies have been commissioned or self-performed during the CAEP/7 that aim to better understand all aspects of local air quality.

Figure 2: Addressing local air quality. NO_2 monitoring stations and the modelling of airport sources (2004).



Relevance of emission sources

In 2004, Unique (Zurich airport), in cooperation with Swiss officials, studied the effects of actual aircraft operations on fuel consumption and NO_x production, showing on average 40 percent less fuel consumption within the Landing and Take-off (LTO) cycle and 30 percent less NO_x emissions compared to using certification schemes. A similar study looked at the effects of the deployment of engine thrust reversal, indicating the additional NO_x emissions are rather marginal.

An additional study in early 2005 had a closer look at the Auxiliary Power Unit (APU) and its emissions, compiling the available operational information and emission factors. The study confirmed the relative importance of this emission source and the need for better understanding of emission factors and operational aspects.

Ground handling activities also contribute to aggregate emissions at an airport. In order to better assess these emissions, Zurich airport developed a methodology for calculating emissions from GSE (Ground Support Equipment) in 2006. This method is based on a detailed operational survey of a ground handler and allows for consideration of a number of operational aspects such as aircraft size, operation type or aircraft stand properties—including spatial and temporal information.

Emissions from GPUs (Ground Power Units) have been of particular interest, as they might serve as an alternative power source to the aircraft's APU. A series of actual exhaust emission measurements were performed in 2005, yielding limited but reliable emission data to be used for inventory purposes.

Recognising that airport emissions on the apron also include emissions from service vehicle circulation there and in the airport operating area, a field study was done to assess airside vehicle traffic. Actual traffic counts in 2007 combined with an airside vehicle traffic model have given not only emission loads for this source, but also their temporal and spatial distribution at the airport.

Sharing expertise

All study results have highlighted the importance of considering operational factors when computing an emission

Zurich airport in a dense environment

inventory. It might be argued that results only suit the local circumstances at Zurich airport and are not transposable to other facilities, but while this may be true for some specific elements it should also be noted that many general results are applicable across a wide range of airports and locations.

The Zurich results have also allowed for reasonable first and consecutive estimates to be developed regarding the relevance of various emissions sources, thus assisting the CAEP's Working Groups in their efforts to put these elements into proper perspective. The studies have been made available continuously to the interested Working Groups and Task Forces of the CAEP to help foster more detailed discussions and provide new perspectives on the work they have undertaken.

The ability of airports to assist in international efforts goes beyond the calculation of emission inventories. Other elements are also important to help understand the full scope of local air quality Issues, including ambient air quality measurements and the modelling of single sources to determine relative contributions. Zurich airport began ambient measurements in 1992 and added comprehensive modelling in 1997, using a state-of-the-art Lagrange model. Other airports began these efforts even earlier than that. While there is ample expertise and data available, the challenge at present is to make this more accessible to international programs.

Having had to design and submit air quality mitigation plans in 1992 and 1999, Zurich airport has also gained experience in successfully addressing air quality problems at airports. Mitigation plans consider all sources of airport emissions.

Zurich airport has thus been able to directly contribute to the efforts of the international aviation community in its quest to better understand and address local air quality effects from aviation. This engagement has also created mutual benefits in as much as airports have gained a better understanding of certain procedures and technical issues that can be disseminated to the broader public.

It should not be neglected that consideration of both public and political perceptions in this area of study is vital for airports to be able to continue to accommodate the growing need for air travel. ■

Visit by the Bahamas to the ICAO NACC Regional Office

From left to right: A. Branville, Minister of State, Bahamas Ministry of Tourism and Aviation; Loretta Martin, ICAO NACC Regional Director; Cyril Saunders, former Director of Civil Aviation; and Ivan Cleare, Deputy Director of Civil Aviation.

SENEAM and COCESNA sign radar data agreement

An agreement between SENEAM and COCESNA for radar data sharing was signed at the ICAO NACC Office early in 2008. Signatories included are: Agustin Arellano (front right), Director General SENEAM; José Ramón Oyuela, COCESNA (front left); and Loretta Martin, ICAO NACC Regional Director (center front as witness of honor).

European States review CEANS developments

An ICAO Workshop on the economics of airports and air navigation services was held in Vienna, Austria, from 2 to 4 December 2008. It was attended by a total of 37 participants from 13 European States and 4 international organizations.

The issues discussed focused mainly on the results of the Conference on the Economics of Airports and Air Navigation Services (CEANS), held in September 2008 in Montreal, and the subsequent changes brought to ICAO Doc 9082—*Policies on Charges for Airports and Air Navigation Services* (Eighth edition).

USOAP Auditor Training Course

Montreal, December 2008

ICAO's Universal Safety Oversight Audit Programme (USOAP) Auditor Training Course, held in early December, 2008, provided the 28 participants shown right with advanced knowledge and skills related to the preparation, conduct and reporting of ICAO safety oversight audits under the new comprehensive systems approach. This course constitutes only the first stage in the process toward becoming an approved ICAO safety oversight auditor. Those participants who successfully completed the course were added to the roster of experts who will be scheduled for on-the-job training on a future audit mission.

President of the Council and Council Members visit the ICAO NACC Regional Office

Mr. Roberto Kobeh González, President of the ICAO Council, is accompanied by ten Council Members during a visit to the ICAO NACC Regional Office as part of a 2008 fact finding mission to Mexico arranged by its DGAC.

Front row, from left to right: Delia Castellanos, DGAC Mexico; Marina Goff, ADM/O; Víctor Hernández, A/DRD; Roberto Kobeh González; Loretta Martin, ICAO RD, Mexico; Dionisio Méndez Mayora, Mexico; Ricardo Delgado, RO/AVSEC; *Back row, from left to right:* Alfonso Escobar, RO/FS; Michael Rossell, United Kingdom; Jaime Calderón, RO/AGA; Gil-Sou Shin, Republic of Korea; Kim Pin Bong, Singapore; Enrique Dávila Severo, Uruguay; Paolo Ciancaglioni, Italy; Donald T. Bliss, United States; Daniel Oscar Valente, Argentina; Shawky Abdel Elazab, Egypt; Tao Ma, China; Jean-Christophe Chouvet, France; Nasim Zaidi, India; Raúl Martínez, RO/AIS.

ICAO USAP auditors at ICAO NACC Regional Office

On their way to Cancun to conduct a Second Cycle USAP Audit, the ICAO auditing team, along with Mexican aviation security officials, stop in to exchange ideas with staff at the ICAO NACC Regional Office in Mexico City.

The International Civil Aviation Organization (ICAO) is the world's global forum for civil aviation. A Specialized Agency of the United Nations, ICAO works through its Member States for a safe, secure and sustainable development of civil aviation.

ICAO is accepting applications for the following position:

Until 12 March 2009
VN PC 2009/04/P-4
Regional Officer, Aircraft Operations and Flight Safety
AFI and Comprehensive Implementation Programme, Office of the Secretary General, Nairobi

All ICAO Vacancies are open to both female and male candidates. In order to increase the representation of women at all levels in ICAO, women are particularly invited to apply for vacant posts or for roster evaluation for future vacancies.

The full details of the above Vacancy Notice and other current vacancy notices, as well as instructions on how to apply, can be found on http://www.icao.int/employment.

Italian assistance to ICAO Environment Unit

Secretary General of ICAO Taïeb Chérif and Italian Representative F.P. Venier after the signing of Memorandum of Understanding providing the services of a Junior Professional Officer (JPO) to ICAO's Environmental Unit to help support the Organization's activities on climate neutrality. The aim is to have a greenhouse gas (GHG) inventory ready by June 2009 and a strategic work plan in place by December 2009.

These activities form part of a broader United Nations initiative to ensure that all its agencies, funds and programmes become climate neutral. ICAO started to take concrete steps towards climate neutrality in March 2008 and the ICAO Headquarters building was also awarded the first *Canadian Leadership in Energy and Environmental Design* gold certification in 2008 for an existing building (LEED-EB), by the U.S. Green Building Council.

Air Traffic Control Association 2008 Award recipients

The Air Traffic Control Association's (ATCA) Awards Program's goal is to give special recognition to those persons and/or organizations engaged in the development, operation or maintenance of the world air traffic control system for outstanding achievement or for an outstanding contribution to ATC. The achievement or contribution so recognised is to be in the public interest and of benefit to the quality, safety and/or efficiency of air traffic control.

2008 ATCA AWARD WINNERS

The General E.R. Quesada Memorial Award
Duane Clefstad, NAV CANADA, Dir. Training

The George W. Kriske Memorial Award
Jeffrey Williams, FAA, RNAV & RNP Program Manager

The William A. Parenteau Memorial Award
Deborah Saito, FAA, Assistant ATM Honolulu Control Facility

The Earl F. Ward Memorial Award
HQ Air Mobility Command TERPS Cell, AMC Directorate of Air, Space & Information Operations

The ATCA Industrial Award
Asia-Pacific
Air Traffic Flow Management Task Force

The ATCA Small & Disadvantaged Business Award
A3 Technology, Inc, Galloway Township, NJ

The Charles E. Varnell Memorial Award for Small Business
SolaCom Technologies, Inc – Franz Plangger, Gatineau, QC, Canada

The ATCA Air Traffic Control Specialist of the Year Award
David Longman, Flight Services Option
Milton Souza, Terminal Option, RVA

Lingiam Odems Memorial Award for Air Traffic Control Specialist of the Military
Jason Butterfield USN, AC1, U.S. Pacific Fleet
SrA Kevin M. Killoren, 325 Fighter Wing, Tyndall AFB, FL
Richard Rehm, ATCS, Carins AAF, Fort Rucker, AL
Staff Sgt. Nathan Vinson USMC, 2D Marine Aircraft Wing

ATCA Airway Transportation Systems Specialist of the Year Award
Zachary Reeves, ET3, USN, USS BATAAN LHD 5
Staff Sgt. Efrain Soto, USMC, 3D Marine Aircraft Wing
Kelshall Williams, ATC Maintenance Tech, F Company 7-101st Aviation Reg. Ft Campbell, KY

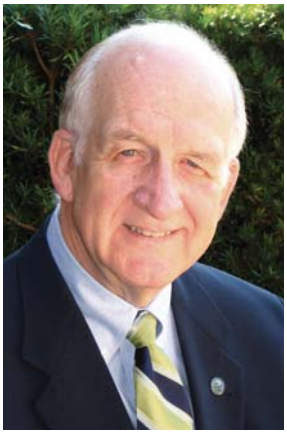
ATCA Life Cycle Management Award
FAA Service Operations Support - 6 Team, FAA William J. Hughes Technical Center, Atlantic City, NJ

The David J. Hurley Memorial Award for Aviation Traffic Management
Lee Phillips, Cairns AAF

President's Citation Award
Scott Embury, Midwest ATC Service, Inc.
Sergey Kulnazarov, Kazaeronavigatsia

The Chairman's Citation of Merit Award
Franette Bourne, William J. Hughes Technical Center, FAA
Lesley Ellis, ATM Bagram ATCT, Midwest ATC Service, Inc.
Baghdad ATC Team, WCG
Mike Gahan, MJG Aviation
Tim Halpin, Crown Consulting Inc.
Capt. Stephen Riley, USN

The Glen A. Gilbert Memorial Award
John Crichton, President and Chief Executive Officer, NAV CANADA



General aviation serving the world

The veins and capillaries of the air transportation system

John Sheehan, Secretary General,
International Council of Aircraft Owner and Pilot Associations (IAOPA)

The airlines have maintained their position as the dominant mode of long-range passenger transportation for more than half a century, growing into an essential worldwide connector for personal and business purposes. Their remarkable rise through good times and bad has ensured a permanent place for the airlines as both a transportation and business venture throughout the world. Yet, they form only one part of the air transportation system; what of the short-range and more personal transportation needs of the individual?

We take for granted the universal appeal and utility of the automobile in satisfying the personal transportation needs of individuals, yet the personal automobile is subject to traffic conditions, road availability and speed limits. General aviation aircraft have overcome these shortcomings, giving unprecedented freedom to passengers worldwide.

The more than 370,000 general aviation aircraft in use today satisfy the business and personal transportation needs of over one million pilots and hundreds of millions of passengers around the globe. These aircraft fly more than 35 million hours annually, many of them for business purposes. Additionally, tens of thousands of light sport, microlight and homebuilt aircraft are used for recreational purposes.

While sometimes seen as a minor part of the world's transportation system, the main body of general aviation contributes a significant amount to the world's economy. For instance, in 2007 general aviation provided a direct contribution to the North American economy in excess of $50 billion. Lesser but nonetheless significant sums accrue to general aviation activity in the remainder of the world.

What is general aviation?

Most people think of general aviation involving mostly small, single-engine propeller aircraft, yet the term encompasses much more—so much, in fact, that it must be greatly generalised. The International Civil Aviation Organization (ICAO) defines a general aviation operation as *"an aircraft operation other than a commercial air transport operation or an aerial work operation."* Aerial work involves aircraft used for specialised services such as agriculture, construction, photography, surveying, observation and patrol, search and rescue, aerial advertisement, etc. While these are official definitions, a number of States combine general aviation, aerial work and small air charter activities under the single heading of general aviation.

General aviation enjoys a tremendous range of aircraft and activities, from airline-type aircraft used for personal and business purposes, through small business-oriented turbine powered aircraft and four-to-six seat aircraft, and further down to two-seat training aircraft. Most of these aircraft are used for the same reasons people use their personal automobiles, yet surveys show that more than half of the general aviation fleet is used in whole or part for business purposes.

Perhaps the most important reason general aviation aircraft are used extensively is that they provide *access and freedom*—access to remote areas, tens of thousands of non-airline airports, and business opportunities, plus freedom to go when an individual chooses without being tied to a schedule or inconvenient routings or crowded airline airports. Importantly, airlines are limited to a few thousand airports worldwide while general aviation may use the tens of thousands of general aviation airports, or in the case of remote areas, a hard-packed surface as short as 500 meters.

One could therefore consider the airlines to be the arteries of the air transportation system, while general aviation provides a complementary network of veins and capillaries.

General aviation and the global system

Most general aviation operations are conducted under visual flight rules (VFR) in which little or no oversight is exercised by air traffic control (ATC) personnel or facilities. Most larger and turbine-powered aircraft, however,

operate under instrument flight rules (IFR) where increasing levels of control are provided by ATC. General aviation seldom seeks to directly compete with the airlines for their routes, terminal maneuvering areas or airports—doing so adds to already congested airspace and airports and is therefore counter-productive. Rather, general aviation, whether operating VFR or IFR, actively avoids congested airspace and major airports where possible, in search of the path of least resistance (whether en route or in the terminal areas).

Increasingly, regional and low-cost carriers have discovered the same general aviation techniques of avoiding busy routes and terminal areas. This has created secondary areas of congestion and has removed some advantages general aviation has long enjoyed, especially at airports located on the periphery of major metropolitan areas. Yet significant operational advantages, derived from operating out of the mainstream and at off-peak hours, still accrue to general aviation operators.

The important lesson here is that general aviation goes out of its way to avoid competition for scarce airspace and airport resources. In doing so, it attempts to operate on the fringes of the air traffic management (ATM) system and at less busy times, in search of more effective and efficient operations. Airspace and ATM systems are designed primarily with airline requirements in mind; general aviation can easily operate at the fringes of these systems, especially if "feeder roads" and "parking areas" for smaller aircraft are designed into the system.

Challenges

General aviation operators are challenged by one of the same advantages they enjoy: access and freedom. While access to the road less-traveled brings distinct advantages, the ability to *gain access* to those areas is sometimes difficult. Airspace is a finite commodity that is often closely controlled and apportioned in many countries. If a major terminal area is covered by closely controlled airspace in which permission to operate VFR is difficult to obtain, convenient flyways are not available to avoid the mass of controlled airspace. Further, this closely controlled airspace often begins at low altitudes for extended areas, creating a potential safety hazard for transiting small aircraft.

Unfortunately, there is little standardization for the placement of airspace types among States. A low altitude area that may use a lightly controlled type of airspace in one country may be closely controlled in a neighbouring State. This makes international flight confusing at times due to the proliferation of airspace types, but more importantly the arbitrary use of closely controlled airspace often denies VFR operations to small aircraft operators.

Similarly, access to airline-served airports is often denied to general aviation operations by restrictive slotting systems, lack of parking areas and handling facilities, as well as excessive landing and handling charges. While general aviation largely avoids this type of airport, alternatives may not be available in many areas, especially for IFR and larger aircraft operations.

A critical subset of airport access is the declining number of general aviation airports worldwide, especially near metropolitan areas. The commercial value of airport land often exceeds its utilitarian value as an essential component of the air transportation system.

Security provisions at many airports and in some types of airspace unduly restrict general aviation operations in large areas of the world. A major obstacle in helping general aviation overcome these restrictions is in convincing international, State and local security agencies that general aviation is truly different than airline operations and should therefore be treated differently. This was accommodated in large measure when ICAO Annex 17—*Security*, was completely revised in 2006, drawing a number of important distinctions between airline and general aviation security requirements. Many States,

however, still neglect the use of threat analysis techniques to adequately define potential hazards arising from general operations. As a consequence, numerous questionable security restrictions persist worldwide for general aviation operations.

Finally, the fee-for-service systems employed in many areas of the world make operations prohibitively expensive for general aviation operators. ATM, weather and NOTAM briefings, as well as en route communications fees when linked with landing, handling and parking charges, create a heavy burden for those who must pay for them with personal or small business funds. General aviation operators acknowledge that fees are an integral part of the air transportation system, however the apportionment of these fees at times acts as a significant obstacle to their operations. Meteorology, NOTAM and en route communications services are significant features in the safety systems supporting general aviation operations; pilots who avoid using these services in an effort to reduce operating costs may increase their operational risks.

A hidden but significant expense for general aviation operators is the entry fee to participate in the rapidly modernizing ATM systems around the world. This entry fee comes in the form of aircraft equipment required to operate within the system. Mode S transponders, new voice and digital communications devices, automatic dependant surveillance (ADS) equipment, emergency locator transmitters and precision navigation equipment are being required to an increasing degree in many parts of the world. A number of these devices may not be optional for the airspace user, whether under VFR or IFR.

This equipment represents the new cost of entry into an increasingly complex system and will be required whether flying at 4,000 or 40,000 feet. With equipment and installation costs starting at $5,000 and spiraling upward, some of this equipment has already forced some operators to either greatly curtail or cease their flying activities.

IAOPA

The International Council of Aircraft Owner and Pilot Associations was formed in 1962 to act as the voice of international general aviation in meeting these and other challenges. The association represents the interests of more than 480,000 general aviation pilots and aircraft owners through affiliates in 67 countries. The IAOPA serves as the principal voice in ICAO and regional fora for personal use general aviation and for aerial work operations. It also serves as a nexus for policy formulation and activism for its affiliates. *Journal* readers may wish to visit www.iaopa.org for more information.

The IAOPA has actively participated throughout its existence in ICAO discussions regarding security, economics, unmanned aerial systems, flight crew licensing and medical certification, operational standards and communications, navigation and surveillance and air traffic management issues. Additionally, it maintains a regular observer within the ICAO Air Navigation Commission, the deliberative body that advises the Council on technical matters.

The future

Despite the foregoing challenges, the future of general aviation is bright due to its ability to provide access to all parts of the world safely and efficiently for individuals and small groups requiring rapid, on-demand air transportation. All of the issues mentioned in the previous paragraphs will continue to provide challenges for the international general aviation community, but the active participation of the IAOPA and its affiliates at the international and State level will assure the viability of its future.

The principal concerns of the community continue to be freedom of access to airspace and airports and general operational costs.

While the growth of general aviation has declined in certain developed areas of the world in recent years, the vast undeveloped areas remaining, especially in economically emerging States, will assure the long-term viability of this essential form of transportation. The lack of roads and supporting infrastructure will continue is these areas for years to come. Until then, access can only be assured by general aviation. In both the developed and developing world, general aviation has proved and will continue to prove its worth as the people's air carrier.

The IAOPA pledges to work with State authorities and aviation organizations in pursuit of common goals to improve and protect civil aviation interests worldwide. ■

Aviation and economic stimulus

Craig L. Fuller, President, International Council of Aircraft Owner and Pilot Associations (IAOPA)

It is a privilege to be able to address the ICAO community so early in my tenure as President and CEO of the United States Aircraft Owners and Pilots Association (AOPA). In a way this is fitting, as one of the first trips I made during my transition last year was to Zurich to meet with the European members of the International Council of Aircraft Owner and Pilot Associations (IAOPA), a group that I am now honoured to serve as President.

For many years, and especially during my posting as Chief of Staff to Vice President George H.W. Bush, I have been committed to sharing ideas with people from other States and have found the lessons learned to be important ones. One such lesson has been that many countries look to infrastructure improvements as a means to jump-start national economies. This is certainly the case now in the United States and represents a tremendous opportunity to aviation.

In meetings with President-Elect Obama's Transition Team after last year's election, we at AOPA U.S. began talking about the importance of including aviation in any economic stimulus plan. Our voice was joined by other organizations from the aviation community and these twelve U.S. groups came together to share their best thinking about how investments in aviation infrastructure will make important contributions to our nation's future economic growth and opportunity.

In recognition of the fact that our message is one that could inform similar decisions being made in other States around the globe, I'm very pleased to share some highlights with the ICAO Journal readership at this time.

The groups that came together to develop the aviation infrastructure initiative are as follows:

1. Aerospace Industries Association
2. Air Transport Association
3. Airport Consultants Council
4. Airports Council International-North America
5. Aircraft Owners and Pilots Association
6. American Association of Airport Executives
7. Cargo Airline Association
8. General Aviation Manufacturers Association
9. National Air Carrier Association
10. National Business Aviation Association
11. National Association of State Aviation Officials
12. Regional Airline Association

As you can see, these organizations represented the entire U.S. aviation spectrum, from airports to airlines to manufacturing to general aviation.

The groups shared the following key thoughts:

- Careful investment decisions made today will provide immediate economic relief—while preparing our national air transportation system for future growth. Moreover, many of the investments we make in our aviation infrastructure today will also reap substantial environmental benefits for years to come.
- An immediate investment of $1 billion in airports was recommended. The groups suggested that additional investment in airports of all sizes would undoubtedly provide needed stimulus to both large cities and rural communities in all 50 states. This is an essential economic lifeline to the international air transportation system through airlines and general aviation. Infrastructure funding would help stimulate the economy by creating approximately 35,000 high-paying jobs. It would also expedite the construction of critical safety, security and capacity projects at airports around the country.
- A key point was made that the aviation infrastructure includes airports, airways, aircraft, and the air traffic management system. In order to support and stimulate the U.S. economy, it is necessary to invest in the entire aviation infrastructure. Safety is enhanced when all aviation users, airlines and general aviation are able to use the latest avionics and navigation technology. To enable many of the changes envisioned in the NextGen Air Transportation System, new aircraft equipment must be purchased and installed to operate in the new system. Incentives or funding to support avionics implementation would accelerate many of the economic and environmental benefits. A $3 billion investment was suggested in this category.
- Finally, there were other suggestions made about considering tax changes to provide incentives to encourage private purchases of aircraft and other related investment.

More on the recommendations from the "Aviation 12" in the U.S. can be found on our Web site at: www.aopa.org.

The AOPA understands that States around the world are looking at investments to speed economic recovery. All of us with a commitment to strengthen the aviation infrastructure should work to make sure full consideration is given to our very vital part of the world's transportation network.

I am very grateful for the opportunity to join the international aviation community as a full time advocate for general aviation. I look forward to finding opportunities to engage in dialogue in order to explore new ideas from around the globe. ■


Effective Global Leadership
Through Balanced Priorities

YOU'D BE SURPRISED WHERE YOU FIND US

As airspace gets more crowded, you'll find Thales taking control.

ATM systems face the same challenge worldwide: economic growth means more air traffic, putting dangerous pressure on existing systems. Thales is the safe choice for future development. We can take on prime contractorship and deliver complete turnkey solutions, gate to gate. We already control the airspace in 180 countries: our EUROCAT ATM system is the industry standard. In technology, we lead the way with Mode S radars and Automatic Dependant Surveillance-Broadcast (ADS-B). In European initiatives we're partners in the Single European Sky (Sesar) and Galileo satellite programmes.

Fully equipped for the present; already planning for the future. If you're looking for the safest route forwards, call Thales.

THALES

The world is safer with Thales

www.thalesgroup.com

AMHS
Extended Service
by RADIOCOM
is growing!

Specially compliant with Doc. 9705/9880
which requires X.400
(with P1, P3 and P7 protocols)
NOT using HTTP

Fully Compliant ICAO SARP

Ecuador
1 AMHS Center
1 Airport (Guayaquil)
7 User Agents

Paraguay
1 AMHS Center
7 Airports
36 User Agents

Brazil
Technical Alliance with atech

2 AMHS Centers
More than 800 User Agents

Argentina
3 AMHS Centers, 73 Airports
172 User Agents

CIPE AMHS Training Center
First AMHS Training Center available for worldwide students by contact to cipe@ciudad.com.ar

Application software under ISO 9001:2000 Certification developed by

SKYSOFT ARGENTINA S.A.
skysoft@radiocominc.com

RADIOCOM, INC.
radiocominc@radiocominc.com - www.radiocominc.com