



McGill

Centre for Research in Air and Space Law
Centre de recherche en droit aérien et spatial

Occasional Paper
Series
No. III

Seeking Global
Environmental Harmony
in Aviation

by

P. Paul Fitzgerald

Occasional Paper Series: *Sustainable International Civil Aviation*

The attached Occasional Papers have been prepared by a group of scholars associated with the Institute of Air and Space Law (IASL) at McGill University. They are the result of a collaborative effort between the IASL and the Centre for International Sustainable Development Law and are designed to be part of a book prepared by authors from both groups which will eventually be published by the Cambridge University Press under the title *Sustainable International Civil Aviation*.

As the title of the book suggests, bringing together these various scholars and papers is the central theme of the sustainable development of international aviation. In particular, the work of the International Civil Aviation Organization (ICAO), the primary United Nations body tasked with regulating the environmental aspects of international aviation, and the provisions of the Chicago Convention which lays down powers of the Organization and the fundamental rules of international air law, form the primary focus of this collection. At the next ICAO Assembly in September-October of 2016, ICAO has the ambitious mandate to finalise a global scheme to limit CO2 emissions from international aviation. As many of the articles contained in the book are of immediate relevance to the discussions due to take place at ICAO, publishing and disseminating these draft chapters will contribute to the growing interest and debates on the issue of the environmental impact of aviation. It is hoped that these papers will contribute to the work of the Assembly and that informed readers and delegates participating at the ICAO Assembly will have constructive comments to share with the authors.

Readers are invited to send their comments to the authors whose e-mail addresses are set out on the title page of each paper as well as a copy to the following address: edannals.law@mcgill.ca

The authors and the Editors of this collection of papers thank all readers for their attention and their comments.

Professor Armand de Mestral, Emeritus Professor, *McGill University, Canada*

Dr. Paul Fitzgerald, *McGill University, Canada*

Dr. Tanveer Ahmad, *North South University, Bangladesh*

SUMMARY

Up-gauging as a solution to greenhouse gas (GHG) emissions from aviation: Is up-gauging a viable tool in reducing GHG emissions in aviation?

The issue:

- Whether up-gauging is a possible commercial option for airlines?
- Whether up-gauging can pass anti-combines and anti-monopoly legislations?

Its importance:

- Engineers are promoting new aircraft designs that would fly more people at one time and be up to 70% more fuel efficient than current aircraft. However, without legal changes in favor of up-gauging, the market conditions, which promote high frequency with small aircraft, will prevent the emergence of such new technology.
- On many long-established routes over the past 20 years, airlines have down-gauged their aircraft by roughly 30% so that three flights in 2012 carried roughly the same number of passengers as two flights did in 1992.
- If up-gauging could be adopted on a wide-spread basis, this might boost the business case for aircraft such as the Large Aircraft for Short Ranges (LASR).

The treaty law:

- Codeshare provisions in Bilateral/Multilateral Air Services Agreements authorized by Articles 1 and 6 of the Chicago Convention.
- The anti-combines and anti-monopoly municipal law of States.

The analysis:

- The S-Curve theory – which posits that airlines that achieve a frequency-share advantage attain disproportionately high market shares and, consequently, revenues since business travelers value schedule flexibility – is counter-intuitive to up-gauging. Despite the lack of reference to environmental concerns as part of its objectives, ICAO has adopted environmental protection and sustainable development of air transport as part of its strategic objectives.
- Up-gauging is a viable commercial option for airlines where they will enter into a limited-scope codeshare agreement to further their commercial objective.

- Up-gauging can pass anti-combines and anti-monopoly legislations if it can be demonstrated that, in the case of European legislation, it will give passengers a greater choice in destinations without having to pay more, or, in the case of Canadian legislation, there will only be a minimum disruption to service, no loss of jobs, no bankruptcy, and no subsidy.
- At present, there are no examples of two or more airlines seeking to justify an endeavor on environmental grounds.

Options for decision-makers:

- 1) States may renegotiate Bilateral/Multilateral Air Services Agreements to encourage Hard Block Code Share Agreements.
- 2) Regulators in different situations may create situations where rival airlines can discuss sharing the capacity of an up-gauged aircraft without any legal ramifications.
- 3) No action on the part of decision-makers that may result in the slow progress in up-gauging.

SEEKING GLOBAL ENVIRONMENTAL HARMONY IN AVIATION

by

P. Paul Fitzgerald*

I. INTRODUCTION

Around the world, three interlocking themes are discussed at aviation conferences: growing airport congestion and the related demands on air traffic management (ATM) systems; the role of commercial aviation in contributing to greenhouse gas (GHG) emissions; and the increasing cost of jet fuel and its impact on airline balance sheets. Increasingly engineers are promoting new aircraft designs that would fly more people at one time and be up to 70% more efficient than current aircraft.¹ However without legal changes, the market conditions that favor the emergence of such new technology will never materialize.

Current market conditions and competition laws promote high frequency with small aircraft and, therefore, on many long-established routes over the past 20 years, airlines have down-gauged their aircraft by roughly 30% so that 3 flights in 2012 carried roughly the same number of passengers as two flights did in 1992. Competition is such that it is not uncommon to see competitor's jets follow each other across the skies.² Such a reality suggests that if the practice could be reversed, so that two aircraft in 2015 would replace 3 aircraft in 2012, GHG targets would be more attainable and there would be a corresponding decline in the demand for Air Traffic Service (ATC) and airport infrastructure. Such a practice would be known as up-gauging and, in order to reach its

* Dr. Fitzgerald handled legal files related to the Air India Flight 182 disaster and has published for over 25 years in peer-reviewed law journals in Canada, the United States and Europe. He has presented papers at international conferences in Canada, the United States, Europe and Asia. Dr. Fitzgerald has taught aviation law to students at McGill University's Institute of Air and Space Law and Chicago's DePaul University College of Law. He has served as an advisor to government on aviation, rail and marine matters. He championed Canada's Blue Skies policy and helped promote changes to the *Canada Transportation Act* and the *Canada Marine Act*. He was awarded the Queen's Golden Jubilee Medal in 2003 and the Queen's Diamond Jubilee Medal in 2012. Dr. Fitzgerald holds an earned doctorate in Law at McGill University's Institute of Air and Space Law. He holds a master of business administration from the Richard Ivey School of Business at the University of Western Ontario, a joint bachelor of common and civil law from McGill University and a bachelor of political science from Université Laval. He is a Fellow of the Royal Aeronautical Society and also a Fellow of the Chartered Institute of Logistics and Transport.

Dr. Fitzgerald can be contacted at: ppaul.fitzgerald@gmail.com.

¹ See Elena de la Rosa Blanco & Edward M. Greitzer, "Subsonic Civil Aircraft for 2035" *AeroAstro 2009-2010* (Massachusetts Institute of Technology, Cambridge, 2010) at 1-9.

² This practice has been observed on domestic routes within Australia, Canada and in the United States.

full potential, changes to competition policy will be required.

Such practice would further sustainable development in aviation in that it would immediately reduce the impact both in terms of GHGs and ATM of commercial aviation, and it would also reduce the consumption of non-renewable hydro-carbons on a per-seat basis. Moreover, if up-gauging could be adopted on a wide-spread basis, this might boost the business case for aircraft such as the Large Aircraft for Short Ranges (LASR), identified later in this paper. Airbus predicts that air traffic in terms of passenger-kilometers will grow by an average of 4.6% annually from 2015 to 2034.³ At the same time, it is obvious that there is a need to reduce not just the number of GHGs emitted per passenger/kilometer, but the total number of GHGs emitted by the airline industry worldwide. Sustainability for the airline industry will require new technologies and new approaches; this paper promotes the latter to stimulate the former.

The idea of up-gauging as way of reducing both GHGs and ATM impact is not new. As early as February 2011, Lufthansa was planning to replace its two wide-body Frankfurt–New York JFK flights with a single Airbus A-380 flight and, in May 2012, Delta called on its commuter partners to replace inefficient 50-seat regional jets with more modern and more capacious 76-seat versions. The trend accelerated in 2016 with mainline carriers beginning to use their own aircraft on routes previously served by commuter partners.⁴ Clearly up-gauging can, in certain cases, be implemented by a single carrier. Nonetheless, if competition policies were amended, one could imagine significant up-gauging on routes operated pursuant to a code-share or metal neutral joint venture.⁵

The challenge is to provide for the GHGs and airport infrastructure benefits that up-gauging might allow, while avoiding the competitive distortions often associated with code-shares and alliances. This chapter will propose a creative approach; that, in limited and defined circumstances, competitive rivals and even rival alliances be encouraged to share the use of an efficient capacious aircraft that is larger than either would have flown on its own account. There are precedents and structures that confirm that such an approach could be implemented without competitive distortions and with the positive externalities described above.

Up-gauging would not be incompatible with the Chicago Convention,⁶ but might require the re-negotiation of some of the Bilateral Air Service Agreements (BASAs)

³ See Airbus, "Global Market Forecast; Flying by Numbers 2015-2034", online: Airbus <www.airbus.com/company/market/forecast/>.

⁴ See Kathryn Creedy, "Regional Airlines, More Communities Threatened As Partners Shift Flying To Mainline" *Forbes* (27 January 2016), online: Forbes <www.forbes.com/sites/kathryncreedy/2016/01/27/regional-airlines-more-communities-threatened-as-partners-shift-flying-to-mainline/#5c383ee35228>.

⁵ "Metal neutral joint venture" is discussed *below*.

⁶ *Convention on International Civil Aviation*, 7 December 1944, 15 UNTS 295, ICAO Doc 7300/6 (entered into force 4 April 1947) [*Chicago Convention*].

concluded pursuant to it. This is because commercial air traffic rights are not regulated by the International Civil Aviation Organization (ICAO) but through the clauses of the BASAs concluded between ICAO member States. For example, Canada's 1989 BASA with Thailand⁷ has clauses limiting capacity for single carrier operation but offers greater flexibility with respect to codeshare arrangements. If up-gauging were to be deployed on a wide-spread basis on intercontinental routes, this might require the renegotiation of certain BASAs.

II. AIR TRAFFIC INCREASES AND THE S-CURVE

In Canada, the United States (US), and, to a lesser extent, the European Union (EU),⁸ airlines are offering more flights with smaller aircraft. This is partly due to the S-Curve Theory which posits that airlines that achieve a frequency-share advantage attain disproportionately high market shares⁹ and, consequently, revenues since business travelers value schedule flexibility.

Thus airlines have reacted by offering greater frequencies and have managed to maintain load factors by reducing aircraft size in a practice known as down-gauging. Initial research¹⁰ indicates that, from 1992 to 2010, over five routes flown between extremely busy airports, namely New York JFK–Los Angeles, Newark–Chicago ORD, Detroit DTW–Chicago ORD, London LHR–Paris CDG, and Toronto–Vancouver, the average number of seats per flight has declined by 36%, 27%, 53%, 33%, and 25% respectively.

These dramatic reductions in seats/flight can be explained in part by the fact that many of the aircraft used in the late 1980s and early 1990s were overly capacious,¹¹ and that major airlines have since contracted flights to regional airlines operating much smaller aircraft.¹² Nonetheless, given that US carriers flew 26% more revenue passengers

⁷ *Agreement between the Government of Canada and the Government of the Kingdom of Thailand on Air Services*, 24 May 1989, Can TS 1989 No 16 (entered into force 30 June 1989).

⁸ EU's explosive traffic growth and rising emissions due to aviation are at least partly due to regional subsidy policies. See generally, P. Paul Fitzgerald, "Europe's Emissions Trading System; Questioning its raison d'être" (2011) 10 *Issues Aviation L & Pol'y* 189.

⁹ See William E Fruhan, *The Fight for Competitive Advantage: A Study of the United States Domestic Trunk Air Carriers* (Boston: Division of Research, Graduate School of Business Administration, Harvard University, 1972) at 126-130.

¹⁰ This involved contrasting flights and average seat offerings on two intervals in the summer of 1992 and 2010. Information was retrieved from the Official Airline Guides, *OAG Desktop Flight Guide: North American Edition*, Volume 18, Number 21 [August 1992] the Official Airline Guides, *OAG Desktop Flight Guide: Worldwide Edition*, Volume 17, Number 6 [August 1992] as well as from airline timetables in August 2010.

¹¹ See Steven Morrison and Clifford Winston, *The Evolution of the Airline Industry* (Brookings Institution Press, Washington, 1995) at 91.

¹² See Aleksandra Mozdzanowska, R. John Hansman & Jonathan Histon, "Emergence of Regional Jets and The Implications on Air Traffic Management," Massachusetts Institute of Technology International Center for Air Transportation, (Cambridge, Massachusetts, 2003), online: DSpace@MIT

in July 2012 than in July 1996,¹³ and that many of the regional carriers operate high frequency flights over big city–big city routes that were previously flown by larger aircraft, the influence of the S-Curve cannot be denied. More often than not, these practices result in the same number of passengers being carried by more flights, with a corresponding increase in take-offs and landings, slot and gate requirements, and GHG emissions per passenger.

A. UP-GAUGING

While North American and European carriers are offering fewer seats per departure, Japanese carriers are forced to recognize the value of an airport and the impact of imported jet fuel. Japan’s busiest route is between two heavily strained airports Tokyo (Haneda) and Osaka (Itami). Over that route between 1992 and 2010, growing demand (107%) prompted Japanese carriers to increase frequency by 81% and average seat count by 14% by up-gauging aircraft size.¹⁴ In Japan, the idea of increasing the number of seats per flight is compatible with environmental goals and increasing the efficient use of high demand airport infrastructure assets such as slots and gates.

B. UP-GAUGING AND S-CURVE

Inherently, it would seem that up-gauging is counter-intuitive; if higher frequencies imply disproportionately higher revenue, any reduction in frequency would tend to dilute revenue. Yet in February 2011, Lufthansa replaced two of its Frankfurt–New York JFK flights with a single Airbus A380,¹⁵ resulting in a reduction of the daily seat capacity by 17 seats or 1.97% and a reduction in the number of flights by 33%.¹⁶ Here, the A380’s attraction to business passengers¹⁷ may off-set potential S-Curve impacts but Metal Neutrality also played an important role.

<dspace.mit.edu/handle/1721.1/35881>.

¹³ See Research and Innovative Technology Administration Bureau of Transportation Statistics information, online: US Department of Transportation <apps.bts.gov/xml/air_traffic/src/datadisp.xml>.

¹⁴ In August 1992, Japanese carriers offered 16 daily Tokyo–Osaka flights, with an average capacity of 406 seats.

By 2010, demand had nearly doubled and carriers offered 29 daily flights with an average of 464 seats per flight

See *Official Airline Guides: OAG Desktop Flight Guide [Worldwide Edition]* 17:6 (August 1992) at 945 and oneworld: *oneworld Timetable*: May 14, 2010–June 11, 2010; Star Alliance, *Star Alliance Timetable*: May 1–July 18, 2010, at 353.

¹⁵ Lufthansa News & Releases, Lufthansa flying to New York with the A380, Lufthansa Media Relations, December 13, 2012 <<http://presse.lufthansa.com/en/news-releases/singleview/archive/2010/december/13/article/1838.html>>. Lufthansa’s A380 has 526 seats.

¹⁶ The other flight is a Boeing 747-400 with 322 seats. Star Alliance Timetable (May 1st 2011 - July 17th 2011) 164.

¹⁷ See Lufthansa, “The A380: Be part of it” <<http://a380.lufthansa.com/TAKEPART/#/DE/EN/HOME>>.

C. METAL NEUTRALITY IS COMPATIBLE WITH UP-GAUGING

On July 23, 2008, Air Canada, Continental, Lufthansa, and United filed an application before the US Department of Transportation (DOT) asking for, *inter alia*, blessing of a highly confidential proposed 4-way joint venture called Atlantic Plus-Plus (“A++”).¹⁸ The DOT stated:

A++ aims to foster “metal neutrality” – a commercial environment in which joint venture partners share common economic incentives to promote the success of the alliance over their individual corporate interests. By pooling resources to improve the overall service offering, and by sharing gains and losses, the partners are able to harmonize the global network and become *indifferent as to which of them collects the revenue and operates the aircraft on a given itinerary*. They are then able to focus on gaining the customer’s business by providing the best available fare and routing between two cities.¹⁹

Indeed, the fact that Lufthansa had received anti-trust immunity to cooperate with United and Air Canada in the A++ metal-neutral joint venture in 2009²⁰ means that, even after the up-gauging, Lufthansa is part of a group that offers 5 flights a day between Frankfurt and New York.²¹ The only other airlines offering non-stop service are Delta²² and Singapore Airlines.²³

Here, cognizant of the low probability of revenue dilution as a result of a frequency reduction, the A++ partners made a business-based decision which reduced the number of flights operated, and consequently the demands on the ATM system, airport infrastructure and GHGs emitted.

D. UP-GAUGING MAKES BUSINESS SENSE

Two factors initially made up-gauging more attractive to airlines; fuel prices that rose dramatically between 1998 and 2005,²⁴ and government strategies to reduce airport

¹⁸ See *Joint Application of Air Canada, Austrian, bmi, LOT, Lufthansa, SAS, Swiss, TAP, and United to Amend Order 2007-2-16 under 49 U.S.C. §§ 41308 and 41309 so as to Approve and Confer Antitrust Immunity*, US DOT, Docket OST-2008-0234, July 23, 2008.

¹⁹ *Show Cause Order 2009-4-5*, DOT, Docket OST-2008-0234, April 7, 2009, 4 [emphasis added].

²⁰ DOT Order No 2009-7-10 (10 July 2009).

²¹ Lufthansa’s A-380 flight number is LH 400, United lists the flight as UA 8841. Lufthansa and United also operate from Frankfurt to Newark. See United System Timetable (June 30, 2012 to July 28, 2012) 171.

²² Delta offers a single daily flight. See Delta timetable August 2012.

²³ Star Alliance Timetable (July 21st 2012 – August 2nd 2012) 155.

²⁴ A 2005 report from the U.S. Government Accountability Office observed that cost of aviation fuel had increased between 1998 and 2005 by 280%. See GAO report GAO-05-945, *Commercial Airline Bankruptcy and Pensions* (Washington September, 2005) p. 6.

congestion.²⁵ Thus, in May 2012, Delta announced a major up-gauging initiative. It would acquire 88 100-seat Boeing B717s and require its commuter partners to dispose of 281 50-seat regional jets, cap the 70-seat regional jet fleet at 102, and increase by 70 the size of the 76-seat two-class regional jet fleet to 325.²⁶ The plan might set an up-gauging “precedent that could spell a sea-change in the structure of the U.S. air transport business”.²⁷

Although there are obviously cases where airlines will up-gauge of their own volition, the S-curve and other factors discourage it and, therefore, progress in this area may be slower than would be ideal.

E. THE LIMITS OF UP-GAUGING

While it is obvious that more capacious aircraft will be heavier than their less capacious competitors, in some cases they will even be heavier on a per seat basis. A European study noted that capacious aircraft are designed for long-haul routes and this limits the potential GHG gain from their use:

To make a better use of available runway capacity and to reduce the environmental impact from aircraft operation, especially at large airports, a large (wide body) aircraft designed for short haul operation would be required.²⁸

Another study argues that, using present technology, it is possible to specifically design a Large Aircraft for Short Ranges (LASR)²⁹ with a capacity of 300 passengers but weighing 26% less and being 22% more fuel efficient than similar-sized long-range aircraft.³⁰ However, the design and creation of a LASR is unlikely in the near future as

²⁵ In January 2008 the FAA proposed a two-part landing fee to help relieve congestion at major airports. See Department of Transportation, Office of the Secretary Federal Aviation Administration, *Policy Regarding Airport Rates and Charges*, 73 FR 3310 (January 17, 2008). See also *Air Transport Association of America, Inc. v. DOT*, et al. (D.C. Cir. 2010) Case: 08-1293.

²⁶ Delta News Release Delta to Take Delivery of Boeing 717 Aircraft Upon Ratification of Pilot Tentative Agreement (May 22, 2012) <<http://news.delta.com/index.php?s=43&item=1624>>.

²⁷ Gregory Polet, “Delta Deal Seals Fate of Hundreds of 50-seat Jets”, *AIN Air Transport Perspective*, July 2, 2012 <<http://www.ainonline.com/aviation-news/2012-07-02/delta-deal-seals-fate-hundreds-50-seat-jets>>.

²⁸ Moshe Givoni and Piet Rietveld, *Comparing the Environmental Impact from Using Large and Small Passenger Aircraft on Short Haul Routes*, Working paper N° 1033 (June 2008) Transport Studies Unit Oxford University Centre for the Environment, at 18, <www.tsu.ox.ac.uk/pubs/1033-givoni-rietveld.pdf>.

²⁹ See Muharrem Mane, Navindran Davendraingam, and William Crossley, “Exploration of Designing Short-Range High-Capacity Aircraft,” (September 2012) 12th AIAA Aviation Technology, Integration, and Operations (ATIO) Conference and 14th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference.

³⁰ Gaetan K.W Kenway, Ryan Hendersony et al., “Reducing Aviation's Environmental Impact Through Large Aircraft For Short Ranges,” 48th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition 4 - 7 January 2010, Orlando, Florida (AIAA 2010-1015), online: University of Toronto <oddjob.utias.utoronto.ca/dwz/Miscellaneous/LASROrlando2010.pdf>.

airlines seem to prefer offering small aircraft and high frequency service on routes between congested airports.³¹ Although Boeing foresees “a modest increase in the average size of airplanes in operation”,³² unless a business case can be made for the creation of the LASR, the plane will never leave the drawing board.

F. A LEGAL CHANGE IN FAVOR OF UP-GAUGING

Indeed, up-gauging only makes commercial sense if the larger aircraft can maintain a profitable load factor and if the above-average yields associated with the S-Curve can be preserved.

III. CODE-SHARE AGREEMENTS

The legal underpinning of the A++ joint venture is the code-share, where one carrier operates the flight and a second markets the seats and the flight carries the two digit IATA flight code of each.³³ The joint venture goes well beyond this, but the basic code-share agreement may be enough to facilitate significant up-gauging and the consequent reduction in GHGs. Although code-share agreements are most frequently present between allied carriers, an alliance is by no means a condition precedent to such an accord. Moreover, the quest to reduce GHG emissions through up-gauging may warrant the conclusion of code-share agreements between competitors and, although such an idea may appear unorthodox, it is not without precedent and is worthy of further exploration.

A. BLOCK SPACE AGREEMENTS

Code-share arrangements often include a Block Space contract, where the marketing carrier buys, and resells as its own, a percentage of seats on the operating carrier’s aircraft. Here, the two carriers compete with each other with respect to the sale of the seats within their allotment and, thus, the seats of the marketing carrier are essentially a “virtual flight”³⁴ within the aircraft of the operating carrier. One observer described the operation of the two blocks of seats sold by competing airlines but carried in the same fuselage as “Two planes flying wing to wing”.³⁵

³¹ Moshe Givoni and Piet Rietveld, *Comparing the Environmental Impact from Using Large and Small Passenger Aircraft on Short Haul Routes*, Working paper N° 1033 (June 2008) Transport Studies Unit Oxford University Centre for the Environment <<http://www.tsu.ox.ac.uk/pubs/1033-givoni-rietveld.pdf>>, at 18.

³² Boeing Current Market Outlook 2012-2031 at 15, online: Boeing <www.boeing.com/commercial/cmo/pdf/Boeing_Current_Market_Outlook_2012.pdf>.

³³ See generally, *The Commissioner of Competition v. Air Canada, United Continental Holdings Inc., United Airlines Inc., and Continental Airlines Inc.* CT-2011-004, Affidavit of Hugh Dunleavy, August 24, 2011, p. 9. See further, Carolyn Hadrovic, “Airline Globalization: A Canadian Perspective” 19 *Transp. L.J.* 193 (1990-1991) at 193 [Hadrovic].

³⁴ *Ibid*, 11.

³⁵ John P McCaffrey, former Vice President of Pan Am, in conversation with the author.

B. HARD BLOCK CODE-SHARE

In a Hard Block code-share, the marketing carrier purchases a defined number of seats from the operating carrier at an agreed price and forfeits the money if the seats are unsold.³⁶ This means that both the airlines assume the cost if they do not sell their full complement of hard block allocated seats.³⁷ In this arrangement, the marketing carrier is competing with the operating carrier with respect to the sale of seats on the same flight.³⁸ Here, the two carriers will “independently sell and market their fares on the code-share service. Each carrier will set its own prices; determine its own fare classes and rules; operate its own independent yield management systems and; sell its products through its respective independent sales networks”.³⁹

C. DOMESTIC CODE-SHARE

The type of domestic code-share envisaged to reduce GHGs is not the sub-contracting of an airline’s routes to a commuter carrier, but rather a limited scope code-share between two competitors of roughly equal commercial standing and reputation.

1. THE US EXAMPLES

United and Northwest have long competed on US-Japan routes.⁴⁰ However, prior to its 2008 merger with Delta Airlines, Northwest offered no service between Arizona and California, and was unable to match United’s service from Phoenix to Tokyo via either San Francisco or Los Angeles. As a result, Northwest concluded a code-share agreement with US Air with respect to certain flights between Arizona and California, and also between San Francisco and Los Angeles. This enabled the carrier to compete with United in the Arizona-Asia and Arizona-Australia markets.⁴¹

³⁶ Steer Davies Gleave, *Competition Impact of Airline Code-Share Agreements, Final Report*, (Brussels; European Commission Directorate General for Competition, 2007) 11 and 84 [STG].

³⁷ Independent Consumer and Competition Commissioner, *Code Share Arrangement between Airlines of Papua New Guinea Limited (Airlines PNG) and Pacific Blue Airlines (Aust) PTY Limited and Virgin Blue Airlines PTY Limited* (Canberra; ICC, September 10, 2008) 4 [ICC].

³⁸ *Ibid*, 20.

³⁹ *Ibid*, 25.

⁴⁰ Each served Tokyo from Honolulu, Los Angeles, San Francisco, Seattle and 3 other U.S. cities. See Northwest Airlines System Timetable, (June 8, 2006 - August 21, 2006). See United Worldwide Timetable (July 2006)

⁴¹ This agreement was in effect from roughly 1994 to the January 7th 1999 Northwest-Continental code-sharing agreement which covered approximately 850 domestic and international flights to 95 destinations (as a result of Northwest’s January 27th 1998 acquisition of voting control of Continental Airlines). The agreement was reprised in 2008 after Continental began its merger talks with United. Source; author’s personal files.

The situation was one of the few, if not the only, examples of a major US airline code-sharing on a competitor's jet flights within the contiguous 48 states.⁴² Indeed, the agreement was extraordinary. On the selected routes, there was a unique cooperation; elsewhere was business as usual. Thus, while Northwest was putting its code on a number of US Air flights,⁴³ the two were clearly competing with each other across the rest of the country. Each had a full coast-to-coast route network and international services to Canada and Europe. Each was a member of different international alliances; US Air was then a British Airways partner and Northwest was in league with KLM. Finally, on the routes where the two would offer competing non-stop services, there was no hint of any collaboration between them.⁴⁴ Northwest also concluded a similar agreement⁴⁵ with America West⁴⁶ to facilitate the former's services to Australasia from Arizona and Nevada.⁴⁷

2. MEXICAN EXAMPLES

If the US experience shows that it is possible for two domestic carriers to code-share on selected routes while competing vigorously on others, all in the best interests of consumers, the Mexican experience takes this theory a step further. Both major airlines of the country, namely Aeromexico and Mexicana (now defunct),⁴⁸ were owned by the same government-run holding company: the Corporación Internacional de Aviación, S.A. de C.V. (Cintra). Aeromexico was a Skyteam member and Mexicana was in the Star Alliance. They competed aggressively against each other, often siphoning passengers to the connecting flights of foreign partners rather than to their domestic rival.⁴⁹

⁴² There are several examples of two major carriers blocking space on the same 'commuter' carrier. Horizon Air (a 'commuter' under the Alaska Airlines umbrella) allowed Northwest to block-space and code-share on some of its turbo-prop services to Vancouver and Victoria from Seattle. Thus two competitors, Alaska Airlines and Northwest, both listed the same Horizon flight as their own. This was not extra-ordinary; the 'commuter' and the 'major' were rarely, if ever in direct competition.

⁴³ Northwest code -shared on three US Air flights from Los Angeles to San Francisco, six from San Francisco to Los Angeles and one round-trip flight between Los Angeles and both Las Vegas.

⁴⁴ The two competed on three routes, Baltimore - Detroit, Detroit - Pittsburgh and Minneapolis - Pittsburgh. Of the 5 flights that each offered between Detroit and Pittsburgh, 2 departed within 20 minutes of a competing flight offered by the other. This was also the case with 1 of the 3 flights that each offered between Minneapolis and Pittsburgh.

⁴⁵ The date of this agreement is hard to confirm as both carriers have since merged with others. Northwest provided some financial assistance to America West in August 1991. See Gale Directory of Company Histories: America West Holdings Corporation <<http://www.answers.com/topic/america-west-holdings>>. The agreement was in place in 1999. Source: author's files.

⁴⁶ America West bought US Air in 2005.

⁴⁷ Without the agreement, Northwest would have had to route the traffic via Minneapolis.

⁴⁸ Mexicana ceased operations on August 28, 2010.

⁴⁹ All the data in this section is based on Aeromexico and Mexicana timetables for 1998 and 1999.

However, an intriguing situation existed on the Acapulco-Mexico route, where Aeromexico and Mexicana code-shared 7 evenly-spaced daily flights.⁵⁰ The code-share was justified on the basis that a quick connection to Acapulco was needed from virtually every flight that arrived in Mexico City. In every other sense they competed. Thus, Aeromexico listed Mexicana's 12 p.m. departure as the connection for the former's Mexico-Paris service, while Mexicana urged Francophiles on the same 12 p.m. departure to remain onboard until the final stop in Chicago where they could connect to a Paris-bound flight on United Airlines. The two competed head-to-head on routes to Los Angeles, New York and Miami, and, thus, the Acapulco-Mexico arrangement could be described as a 'limited cooperation where necessary but not necessarily cooperation'. However, this unique code-share enhanced competition, giving passengers a choice of carriers and itineraries and, ultimately, prices.

D. CODE-SHARE LESSONS LEARNED

These three code-share examples - Northwest-US Air, Northwest-America West, and Aeromexico-Mexicana - confirm the fact that rival airlines may enter into limited-scope code-share agreements to further their objectives. Northwest's code-share agreements gave it the ability to effectively compete against United Airlines for Australasia traffic from Arizona and Nevada. The Aeromexico-Mexicana agreement resulted in shuttle service between Acapulco and Mexico City, and increased competition on routes between Acapulco and Europe.

In each case, the code-share agreement facilitated increased competition over an inter-continental route, such as Phoenix-Tokyo or Acapulco-Frankfurt, and did so without being any more comprehensive than absolutely necessary. These code-share examples illustrate code-share arrangement between otherwise unaffiliated equal carriers. Each of the five airlines chosen for these examples - Aeromexico, America West, Mexicana, Northwest, and US Air - was, at the time of the agreement, a fully independent network carrier with a nationwide route system and international services.

These examples stand as precedent for an unusual proposition, the creation of limited-scope code-share agreements between two strong competitors with respect to joint service over a domestic route. If such agreements can be justified on the basis of increased connectivity, it should also be possible to justify and encourage such agreements on the basis of reducing GHGs.

⁵⁰ *Ibid.*

IV. ANTITRUST IMMUNITY PRINCIPLES

Every major jurisdiction has anti-combines and anti-monopoly legislation. Article 101(1) of the *Treaty on the Functioning of the European Union* (TFEU),⁵¹ section 90.1(1) of Canada's *Competition Act*,⁵² and America's *Sherman Act*⁵³ all prohibit anti-competitive activities. However, some of the debate surrounding the passage of the 1890 predecessor to the current US Antitrust law considered whether a monopoly whose efficiencies decreased consumer prices might be acceptable in certain situations.⁵⁴

Thus, Article 101(3) of the TFEU, section 90.1(4) of Canada's *Competition Act*, and 49 USC § 41308(b) permit anti-competitive activities, where they:

- “improve the production or distribution of goods or to promoting technical or economic progress, while allowing consumers a fair share of the resulting benefit”;⁵⁵
- are “likely to bring about gains in efficiency”;⁵⁶
- are deemed to be in the public interest⁵⁷ (a term which embraces a “likelihood that consumers would benefit”),⁵⁸ “new service options and fare benefits for consumers”;⁵⁹ or
- are “likely to generate substantial public benefits to the traveling and shipping public”.⁶⁰

European concerns can be met if the merged entity or joint venture will “provide air passengers with a greater choice of destinations and services without having to pay a higher price on those routes where their presence is the strongest”,⁶¹ and sometimes for Canadian authorities the threshold is met if there is a “minimum disruption to service, no loss of jobs, no bankruptcy and not a nickel in subsidy”.⁶²

⁵¹ *Consolidated Version (2010) The Treaty on the Functioning of the European Union*, [2010] OJ, C 83/47 at 89.

⁵² *Competition Act*, RS 1985, c 34, s 90.1(1).

⁵³ *Sherman Act*, 26 Stat 209 (1890). See also 15 USC § 1.

⁵⁴ See Christopher Grandy, “Original Intent and the Sherman Antitrust Act: A Re-examination of the Consumer-Welfare Hypothesis” (1993) 53 *The Journal of Economic History* 359 at 365. See the amendment to the Bill proposed by Senator Aldrich.

⁵⁵ *Consolidated Version (2010) The Treaty on the Functioning of the European Union*, 2010 O.J. (C. 83) 47 (EC). See also *Council Regulation (EC) No 1/2003 of 16 December 2002 on the implementation of the rules on competition laid down in Articles 81 and 82 of the Treaty*, 2003 O.J. (L. 1) 1 (EC).

⁵⁶ *Competition Act*, (R.S. 1985 c. 34) s. 90.1(4).

⁵⁷ 49 U.S.C. § 41308. Exemption from the antitrust laws.

⁵⁸ DOT Order No 2008-5-32 (22 May 2008), p. 3.

⁵⁹ DOT Order No 2009-7-10 (10 July 2009), p. 1.

⁶⁰ DOT Order No 2010-7-8 (20 July, 2010), p. 1. Identical language is used in DOT Order 2010-11-10 (10 Nov, 2010), p. 1.

⁶¹ Commission clears merger between Air France and KLM subject to conditions, Brussels, 11 February 2004, IP/04/194

⁶² The Hon. David Collenette, then Canada's Minister of Transport, on March 31, 2000 addressing

It is proposed that environmental benefits, in particular a reduction in GHG emissions, be considered as part of any analysis to grant antitrust immunity to a joint venture or merger. For example, as part of the ongoing EU investigation of the A++ joint venture,⁶³ EU authorities should consider Lufthansa's aircraft up-gauging on the Frankfurt–New York JFK route, and require as a condition of approval that the A++ joint venture partners up-gauge future operations on routes from Frankfurt to Chicago, San Francisco, Toronto and Washington. This is because, if EU authorities approve the joint venture, the A++ partners will be alone in offering non-stop flights over these routes and, therefore, S-Curve considerations do not apply. The same philosophy should apply to EU consideration of Skyteam or OneWorld proposals, and result on similar up-gauging where approval would make the carriers dominant on the route in question.

It is argued that public benefits tests should be read to include 'reduced GHG emissions associated with the operation of the joint venture as contrasted with those of the individual airlines involved'. At present, there are no examples of two or more airlines seeking to justify an endeavor on environmental grounds. Nonetheless, given the increased global preoccupation with the airline industry's connection to climate change and the need for achieving sustainable development in aviation, regulators in Canada, the US, and the EU should consider including "environmental" or "ecological" in the grounds for ATI relief on routes, especially where there is a substantial likelihood of up-gauging.

A. ANTITRUST IMMUNITY LEADS TO UP-GAUGING

In past airline mergers, on routes where two former rivals competed with each other using smaller aircraft, up-gauging was often a result. The 1988 acquisition of Wardair by Canadian Airlines saw changes to routes from Toronto to Edmonton, Calgary, and Vancouver; in the first case frequency was cut by 42% while seat count was reduced by only 14%.⁶⁴ In 2008, after the Delta–Northwest merger,⁶⁵ in three instances on the Minneapolis–Atlanta route, a Delta 65-seat CR7 regional jet and a Northwest 122-seat DC9 were replaced with a single Delta 186-seat 757.⁶⁶ Comparable up-gauging occurred on the routes from Detroit to Atlanta and from Minneapolis to Salt Lake City. Similar up-

legislation (Bill C-26 an *Act to amend the Canada Transportation Act*) to allow Air Canada to acquire financially troubled Canadian Airlines. See Parliament of Canada, *House of Commons Debates*, Volume 136, Number 76, p. 5512.

⁶³ See European Commission, "Communication of the Commission published pursuant to Article 27(4) of Council Regulation (EC) No 1/2003 in Case COMP/39.595 – Continental/United/Lufthansa/Air Canada," 2012 O.J. (C. 396) 21 (EC), online: EUR-Lex <eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2012:396:21:0023:EN:PDF>.

⁶⁴ See Canadian Airlines Timetable (October 1988), Wardair Canada Schedule (January 1989), Canadian Airlines Timetable (October 1989).

⁶⁵ The merger was completed on October 29, 2008.

⁶⁶ See Executive Travel SkyGuide (June 2008) 271-272 and Delta Worldwide Timetable (July 2012), 246.

gauging is believed to have occurred on routes between United and Continental hubs, such as Denver–Newark, Houston–Chicago, Houston–Denver, and Houston–San Francisco. Nonetheless, the difficulty of accessing data makes confirmation difficult.

Without anti-trust immunity, airlines cannot coordinate schedules and certainly cannot agree to share one large aircraft rather than each flying its own smaller aircraft. Yet it is precisely this kind of thinking that is a precondition to the development of Large Aircraft for Short Ranges, as in almost every other case, one airline cannot obtain enough customers for a short-range flight without sacrificing the frequency that is the essence of S-Curve revenues. Thus, in the absence of some sort of antitrust immunity, rival airlines are very unlikely to ever give serious consideration to the idea of sharing the capacity of a large aircraft rather than flying two competing small aircraft.

B. IMPLEMENTING UP-GAUGING

Initially, the two airlines would have to negotiate a “Hard Block” Space Agreement between an operating carrier and a marketing carrier such that the economic risk of the flight was equally shared between the rival carriers, and that each would assume full responsibility for marketing and selling its respective share of the aircraft’s capacity.

If, for example, such an arrangement were to occur between Delta and United on the route between Chicago and Detroit, Delta might offer Chicago passengers connections to its Europe-bound flights at Detroit, whereas United would offer Detroit passengers connections to its Asia-bound flights at Chicago. By doing so, each airline would be using the flight to carry passengers from a “spoke city” through its hub to another destination.

Here, the rivals would compete not only with respect to the passengers traveling between the two cities but also for international and trans-continental traffic at their respective hub cities. Through sharing the operation of a large aircraft, GHGs could be reduced as would demands on ATM and airport infrastructure. However, as the example illustrates, it is possible to design such a code-share in order to minimize any potential competitive distortions. Nonetheless, in cases where the up-gauging would potentially require a LASR, conditions must be created to favor the design and manufacture of such an aircraft.

V. CONCLUSION

The fact that airlines, such as Delta and Lufthansa, have concluded that up-gauging makes commercial sense should encourage other airlines to embrace it. However, in a world focused on S-Curve concerns, and painfully aware of the power of over-capacity to depress yields, airlines may be less than fully enthusiastic about adopting this strategy. If regulators in different jurisdictions can be encouraged to create situations where rivals

can safely discuss how to best share the capacity of an up-gauged aircraft, which in turn promotes two public goods, efficient transportation, and a clean environment, the world will be better off.

Implementation of such a strategy will not be easy. Relatively few airlines have extensive experience participating in a code-share arrangement that does not involve either a subordinate partner airline or an alliance partner. Nonetheless, there are reasons to believe that such an approach has merit; carefully structured code-share agreements between rivals have promoted inter-continental travel in Mexico, Canada, and the US. If such arrangements can be concluded in the furtherance of international relations, how much greater will their potential be when applied to address climate change concerns?

Aircraft, such as the LASR, have enormous potential to reduce congestion, GHGs, and fuel consumption. Nevertheless, their existence depends to a large extent on re-examining existing approaches to competition on high-density routes. Quite simply, the S-Curve world of competing small jets following each other across the sky is incompatible with their design.

Some airlines have already embraced up-gauging and others have used innovative code-share arrangements with competitors to offer increased access to customers. The use of Hard Block Code-Share agreements between competitors on short-haul high-density routes will help create the business case for the LASR. But regulatory encouragement from authorities in Canada, the US, and Europe will be necessary to spur such agreements.

There has been much discussion on aviation and the environment, and much examination of incremental changes of technology, engine design or fuel types. The LASR requires a rethink of existing competitive practices on short-haul routes, both from the perspective of the airline executive and of the regulator. When airlines propose alliances or metal neutral joint ventures, if regulators see the potential of rivals to share a more capacious aircraft, they should find ways to enable such practices and thereby incite the type rethink that will enable real reductions in GHGs from aviation.

All rights reserved 2016 ©.

Any reproduction, publication and reprint, whether printed or produced electronically, in whole or in part, is permitted only with the explicit written authorisation of the Centre or the author. The author is exclusively responsible for the contents of this paper as well as propriety of any material used therein.

About Centre for Research in Air and Space Law

The McGill University Centre for Research in Air and Space Law is the principal research and educational outreach arm of McGill's Institute of Air & Space Law, established in 1951. The Institute provides the core degree-granting educational programme, while the Centre produces research, publishes books and other literature, and offers educational products around the world.

Since its inception in 1976, the Centre has published a number of monographic studies, proceedings of symposia, reports and books, and held numerous workshops, seminars and conferences in Montreal and various other international venues.



Centre for Research in Air and Space Law
Centre de recherche en droit aérien et spatial
McGill University
3690 Peel
H3A 1W9
Quebec, Canada
514 398 5095

For more information, please visit:
Institute of Air and Space Law
<https://www.mcgill.ca/iasl/>

Centre for Research in Air and Space Law
<https://www.mcgill.ca/iasl/centre>