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Agency

An Assessment of Air Passenger Level of Service Indicators in Canada

Background Research Paper

Industry Regulation and Determinations Branch

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A key mandate of the Canadian Transportation Agency is to help resolve disputes between air passengers and the airlines. Since a portion of these disputes are concerned with level of service provided by the airlines to their passengers, the Agency's Members would be well served by having a deeper understanding of various level-of-service indicators including trends and the factors that drive these trends. This report provides an assessment of key air passenger level of service indicators and discusses issues concerning ongoing data collection. This research study was led by Peter Lok with assistance from Hakan Andic with statistical and data support from Jocelyn Charbonneau and Normand Girouard. Note that the views expressed in this research paper are those of the author alone and do not necessarily represent those of the Canadian Transportation Agency or the Government of Canada.

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Version Control

Version	Date Completed	Comments
V 0.1	August 16, 2011	Initial Draft (excluding results of Transport Canada interviews)
V 0.2	April 30, 2012	Draft with Transport Canada interviews. LOS data updated to capture intervening period between drafts. Regulatory environment section updated to capture changes in the intervening period.
V 0.3	May 31, 2012	Chapter 7: Recommended Air Passenger LOS Indicator Plan added to flesh out recommendations including ongoing briefing of Members.
V 1.0	June 4, 2012	Final draft submitted.
V 1.1	July 4, 2012	Highlights section added. "Complaints Funnel" estimates developed along with additional estimates of LOS indicators for Canada based on US data. Member briefing recommended frequency changed from quarterly to annual.

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Glossary

ACARS	Aircraft Communication Addressing and Reporting System
AEA	Association of European Airlines
APR	Air Passenger Rights
ATC	Air Traffic Control
BTS	Bureau of Transportation Statistics
CAD	Canadian Dollars
CRA	Canadian Revenue Agency
DOT	Department of Transportation
EC	European Commission
eCATS	Electronic Collection of Aviation Statistics
EU	European Union
FAA	Federal Aviation Authority
GDP	Gross Domestic Product
IATA	International Air Transportation Association
IFR	Instrument Flight Rules
LOS	Level-of-Service
NAS	National Aviation System
OAG	Official Airline Guide
RPK	Revenue Passenger Kilometer
RPM	Revenue Passenger Mile
RTK	Revenue Ton Kilometer
RTM	Revenue Ton Mile
SAAR	Seasonally adjusted at annual rates
SARS	Severe Acute Respiratory Syndrome
SDR	Special Drawing Rights
SITA	Société Internationale de Télécommunications Aéronautiques
SRS	Schedule Reference Service
US	United States
USD	United States Dollars
VFR	Visual Flight Rules
WOE	Withdrawal of Enthusiasm

Highlights

- Several journal articles, expert opinion and analysis of complaints filed with the Canadian Transportation Agency (Agency) suggest using the following air passengers level-of-service (LOS) metrics for assessing the quality of an air carrier's service from a passenger's perspective:
 - Flight Disruptions (on-time performance, flight delays and flight cancellations)
 - Denied Boarding
 - Mishandled Baggage
- These three LOS categories comprise around 40 percent of the total complaints that the Agency received in 2011 and they account for three quarters of the complaints over which the Agency has a mandate (i.e., removing complaints over quality of service and safety).
- Very few publicly available air passenger LOS indicators – government or private sector – are available in Canada. Some LOS metrics could be constructed for Canada using a combination of databases, some of which would need to be purchased or obtained through cost sharing with Transport Canada.
- Unlike Canada, a wide assortment of air passenger LOS data for the United States is published monthly by the Department of Transportation's Bureau of Transportation Statistics (BTS).

On Time Performance

- Air carrier on time performance is closely linked to variables such as inclement weather, airspace congestion and aircraft turnaround times. Data for the United States display pronounced seasonal patterns (e.g., declines during periods of peak demand) as well as a long term cyclical pattern that closely tracks the business cycle.
- On-time arrival performance by WestJet compares favourably against the average for US air carriers over the past 5 years. However, in the first quarter of 2013, only 63 percent of WestJet flights arrived within 15 minutes of the scheduled time.
- Air Canada's on-time arrival performance over the past year ranks at or near the bottom of the US air carriers included in the BTS survey. In the first quarter of 2012, only 55 percent of Air Canada flights arrived within 15 minutes of their scheduled time. Unfortunately, Air Canada has stopped publishing this statistic.

Flight Delays

- In the United States, most flight delays are due to issues with the air carrier (e.g., aircraft, crew, etc.), national aviation system (e.g., air traffic control, airport operations, non-extreme weather conditions, etc.).
- Inclement weather remains an important causal factor for flight delays. Although "extreme" weather conditions are cited in only 3 percent of the delay cases, the BTS estimates that around 75 percent of delays recorded under the "aviation system" category are actually weather related. If these delays are combined with "extreme" weather, then approximately 39 percent of delays can be attributed to poor weather conditions.

- Staff was unable to locate any publicly available Canadian air carrier delay data and key differences in many aspects of the aviation systems in Canada and the United States preclude extrapolation of US data to Canada.

Flight Cancellations

- Flight cancellations can be extremely disruptive to everyone involved – passengers and air carriers alike. Fortunately, cancellations remain a relatively rare occurrence for most air carriers.
- Flight cancellations data display strong seasonal fluctuations, commonly spiking during the winter when there is extremely high demand coupled with inclement weather conditions. Longer term trends suggest that the proportion of cancelled flights in the United States is declining.
- WestJet, the only Canadian air carrier to publish data on cancellations, generally posts lower cancellation rates than the average for US carriers. In 2012 WestJet's cancellation rate was 1.2 percent (98.8 percent flight completion rate) compared to a 1.3 percent average rate for US air carriers.

Denied Boarding

- Most incidents of denied boarding or "bumping" result from air carriers overbooking – a practice that the majority of air carriers in the United States and Canada employ as a hedge against passengers who make reservations but fail to show up to the flight. JetBlue and WestJet are the only major carriers that have a stated policy against overbooking.
- Data for the United States display pronounced seasonal fluctuations in the number of involuntarily denied boarding passengers (i.e., those that are "bumped") as well as an upward trend over the past decade.
- Although there are no published data for Canada, extrapolation of US results suggest that Canadian denied boarding rates would fall in a range of between 0.50 to 1.40 passengers "bumped" per 10,000 passenger enplanements.

Mishandled Baggage

- Similar to other performance metrics, the rates of mishandled bags (i.e., lost, stolen, damaged) show pronounced seasonal and cyclical patterns closely correlated with peak travel demand. Over the long-term, however, mishandled baggage rates have been declining.
- Fifty percent of lost airline baggage in the United States is attributed to a flight connection (i.e., the baggage did not make the flight connection). Data from Europe and other jurisdictions also support this finding.
- There are no publicly available air carrier baggage data for Canada. WestJet, the only Canadian company to publish its mishandled baggage rates, typically performs well against the average rate of US air carriers. However, in first quarter of 2012, WestJet posted a baggage rate of 3.3 per 1,000 enplaned passengers compared to 3.2 for US carriers.

1.0 Introduction

Calgary, June 13, 2012 A five-hour lightning advisory created major delays for flyers coming in and out of the Calgary International Airport. Dozens of bleary-eyed travellers lined up to rebook flights Wednesday evening, including Sophia Gould. Gould said she was bitter after spending five hours on the tarmac. The Newfoundland-bound flyer lamented being stuck in Calgary for two extra nights, missing her luggage and needing to find Kirby Litter for two "travel buddies" who were caged for more than seven hours. The good news? "My boyfriend told me we get a free toothbrush," Gould said. "I'm trying to have fun with it, but I'm really pissed off." The airport was put under advisory about noon after lightning strikes were

reported in the area. Flights were cancelled or delayed as it wasn't safe for workers on the tarmac, said airport spokeswoman Jody Moseley. It's unclear how many delays were caused, but Moseley said "there were quite a few airlines and passengers affected." About 36 arrivals and 39 departures were cancelled, according to yyc.com, which Moseley said airlines are responsible for reporting. Spokeswoman Jennifer Stamford said in an e-mail that 58 flights were cancelled through the WestJet network - most of them in Calgary. The advisory was lifted about 5 p.m. Moseley encouraged travelers to check with airlines or visit yyc.com before heading to the airport.¹

Thunderstorms, snowstorms, power failures, acts of terror and even volcanic eruptions can create disruptions for air carriers and their passengers at the best of times. Throw in strained air traffic capacity during peak travel periods, air carrier labour-management friction, tight flight connections along with a healthy dose of human error and the usual convenience of modern air travel can easily turn into a nightmare for all concerned. The result is frequently a flood of complaints to the air carriers' customer service lines and much ill will, even when the root cause might clearly be an Act of God.

But what constitutes quality in the air transportation industry? What do air passengers value? How can air passenger service quality be measured? Are there level-of-service data for Canadian air carriers? This research paper attempts to answer these questions by examining air passenger level-of-service indicators in Canada.

1.1 Background

One of the Agency's core responsibilities is dispute resolution concerning complaints about transportation service, rates, fares and charges. With respect to air transportation matters, part of the Agency's mandate is to ensure that federally-regulated air carriers apply their terms and conditions of carriage as set out in their domestic or international tariffs or that such terms and conditions are not unjust, unreasonable or unduly discriminatory. These disputes primarily relate to the following categories (note that not all are within the Agency's mandate and these are referred to the appropriate authority for resolution):

- **Flight Disruptions.** Complaints concerning flight delays, delays on tarmac, diversions or cancellations are included in this category.
- **Marketing and Sales.** This category includes disputes that arise over marketing, ticketing, reservations, etc.

¹ Bryan Weismiller, Thunderstorms cause major delays at airport, *Calgary Herald*, June 13, 2012.

- **Baggage.** Baggage disputes are associated with complaints concerning lost, damaged or delayed baggage, free baggage allowances and excess baggage charges.
- **Service/Safety.** Although tracked by the Agency, disputes related to the quality of service or safety lie outside of the Agency's mandate and are usually referred to the airlines and Transport Canada respectively. As a result, the study will not examine these indicators.
- **Other.** Other disputes within the Agency's mandate including issues related to denied boarding (bumped), refusal to transport, carrier-operated loyalty programs, cargo, etc.

In the 2011/12 fiscal year, the Agency registered 101 complaints from consumers. Although the majority are resolved through the Agency's informal facilitation process, the members are called upon to resolve the residual unresolved complaints through formal adjudication. The Agency can also, on its motion, assess the reasonableness of the terms and conditions of carriage applicable for international air services. Typically, the Agency would have about a dozen such actions a year.

Whenever the Agency must assess the reasonableness of a term and condition of carriage, whether on complaint or on its own motion, it must weigh the respective interest of the air carriers and the air travellers, bearing in mind the overall industry context.

Members and Agency Staff would thus benefit if they had ready access to recent level of service indicators for the industry as a whole along with a discussion of the major drivers influencing the indicator in question and recent trends. This would serve to contextualize the significance of both the specific issues to be addressed by the Agency and of the actions of the Agency itself, help to establish priorities for own motion actions, provide a frame of reference whenever Agency staff or Members are dealing with such matters.

1.2 Research Objectives

The primary research objective is to analyze and provide a critical assessment of air travel industry level-of-service (LOS) indicators that could be used as background information by Agency members and staff involved in adjudicating disputes or addressing tariff matters. Where possible, the major driver(s) behind the indicator trends will be identified along with any evident trends. Where data are lacking for Canada, alternative data sources from other jurisdictions will be analyzed to assess their suitability as proxies for the Canadian context.

1.3 Layout of the Report

The report is presented in 7 chapters and 2 appendices. Following this introduction, Chapter 2 will examine what indicators are important to air travellers. Failure to provide service that is important to air travellers will certainly drive complaints. Analysis of the indicators that are critical to quality will therefore help in the determination of what to track.² A suggested data set of level-of-service indicators within the Agency's mandate will then be presented.

Chapter 3 provides background on level-of-service indicators in air transportation by exploring changes in the regulatory environment. In addition to describing level of service regulations in

² Readers may find it useful to refer to Appendix A, which examines consumer satisfaction theory, while reading this chapter.

Canada, the chapter briefly presents the experience in other jurisdictions. The experience in other jurisdictions is important as air travellers often compare and contrast their experience with the treatment of fellow passengers from other countries and can set future expectations for service quality.

In Chapter 4, a variety of data-related issues such as coverage, quality and availability are discussed. Where data are lacking for Canada, the report suggests alternative data sources that may still provide value in providing context for dealing with Agency disputes.

A set of proposed air passenger level-of-service indicators is presented in Chapter 5. In addition to identifying trends, the data are analyzed to determine the key drivers or determinants. Wherever possible, Canadian data was used. In the absence of Canadian data, proxy data from other jurisdictions is presented to illustrate international trends. In some cases, order-of-magnitude estimates are made for corresponding Canadian data.

A comprehensive set of aviation level-of-service data has been considered for Canada in the past. Chapter 6 explores options for collecting such data. A summary of the study findings are also presented including a discussion of the issues related to the on-going collection of level-of-service indicators.

Finally, a plan for on-going monitoring by the Agency of the selected aviation level-of-service indicators is presented. This plan includes the level of service indicators to be monitored, Canadian data set to be used where available, U.S data to be used where Canadian data is not available, and analysis of trends and other relevant factors.

In addition to the main report, there are two appendices that provide further details for the reader. Appendix A is a brief discussion of a key management science consumer satisfaction model developed in Japan in the context of quality management but with examples for the air travel industry. Appendix B provides a brief overview of the relationship between air traffic demand and economic growth.

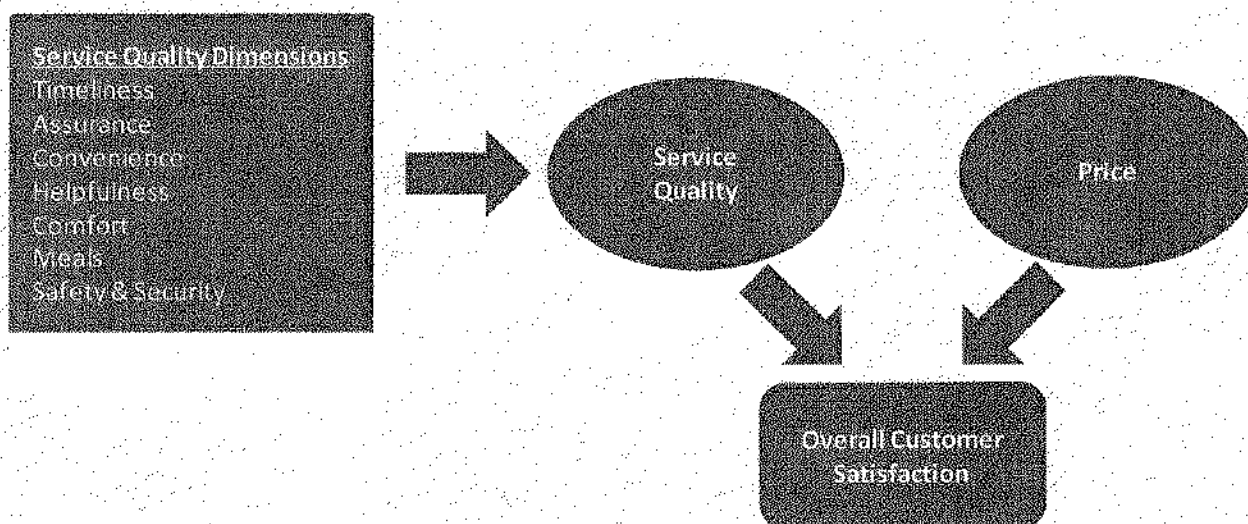
2.0 Selecting Level-of-Service Indicators

2.1 Critical to Quality – What’s Important to Air Travellers?

The quality of service provided by a company is generally considered to drive customer satisfaction.³ As a result, when selecting which level-of-service indicators should be included in a comprehensive data set, it is desirable to understand the dimensions of service quality from the standpoint of an air passenger.

Research has generally concluded that service quality and price are the key drivers of customer satisfaction in the service industry. But what constitutes good service quality? One study of international air travellers⁴ suggests seven service quality dimensions as depicted in Figure 1.

Figure 1: Conceptual Customer Satisfaction Model



Source: Michael Clemes et. al. "An Empirical Analysis of Customer Satisfaction in International Air Travel", *Innovative Marketing*, Volume 4-2, 2008.

The service quality dimensions are defined as follows:

- **Timeliness.** The speed and promptness of the service -- performing the service at the designated time.
- **Assurance.** The knowledge and courtesy of employees and their ability to convey trust and confidence
- **Convenience.** The ease of check-in and overall convenience of the arrival and departure schedule.
- **Helpfulness.** The consideration, respect and helpfulness of any personnel in contact with passengers.
- **Comfort.** Comfort of the aircraft including legroom, seat size, recline angle and overall passenger comfort.

³ Cronin, J., Brady, M., and Hult, G. "Assessing the Effects of Quality, Value, and Customer Satisfaction on Consumer Behavioral Intentions in Service Environments". *Journal of Retailing*, 76 (2), 2000.

⁴ Clemes M., Gan C., Kao T.H., Choong, M., "An Empirical Analysis of Customer Satisfaction in International Air Travel", *Innovative Marketing*, Volume 4-2, 2008.

- **Meals.** The quality of in-flight catering (note that this study involved international “high frills” airline passengers)
- **Safety and Security.** Includes physical safety and security as well as financial security and confidentiality.

Not surprisingly, many of these service dimensions are intangibles and are challenging to quantify. A tasty meal for one passenger might be deemed completely unpalatable by another. Through the use of a survey instrument featuring a Likert-type scale (e.g., strongly agree, agree, neither agree or disagree, etc.) the service dimensions were analyzed to assess their overall impact on customer satisfaction.

Safety and security was cited as the most important dimension for the international air passengers surveyed in the study. The complete rank ordered list of airline passenger service quality dimensions in descending order is as follows:⁵

1. Safety & Security
2. Helpfulness
3. Meals
4. Comfort
5. Convenience
6. Assurance
7. Timeliness

These results are not atypical of similar survey-based studies conducted after 9/11 in 2001 and the SARS outbreak in 2003. With the exception of Timeliness (ranked as least important among the seven examined in this survey), however, these dimensions of service quality do not correspond to the category of complaints that the Agency has a mandate to adjudicate.

One of the primary reasons for this lack of correlation is that survey-based studies are not well suited to capture what are termed “must be” service quality attributes, which are those that define the minimum level of service standard. In most cases these attributes only surface through complaints that occur when the minimum standard has not been met for some reason (see Appendix A for further details).

Another way to look at service quality is to use expert opinion to gauge the relative importance of different broad service categories on customer satisfaction. The annual Airline Quality Rating report from the United States surveys 65 airline industry experts and combines their views to determine the relative importance in overall service quality.⁶ The rank order and weighting of U.S. Department of Transportation data are provided in Table 1 (a minus sign indicate a negative correlation between the criteria and overall service quality).

Table 1: Weighting of Airline Performance Quality Rating Criteria

Category	Weight
On-time Performance	8.63
Denied Boarding	-8.03
Mishandled Baggage	-7.92

⁵ Ibid. pg. 56.

⁶ Bowen, B. D. and Headly D. E., *Airline Quality Rating 2011*, April 2011.

Category	Weight
Customer Complaints	-7.17

Source: Bowen, B. D. and Headly D. E., *Airline Quality Rating 2011*, April 2011, pg. 3.

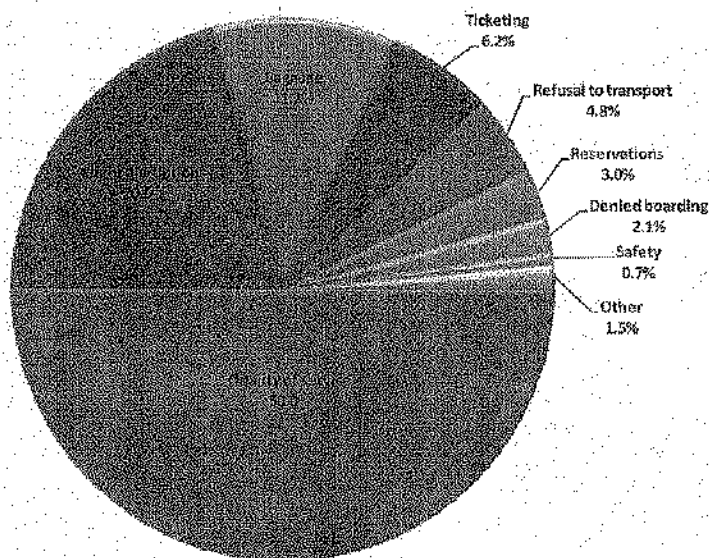
2.2 Complaints to the Canadian Transportation Agency

Every year the Agency receives complaints from the travelling public involving disputes with the airlines. The complainant is expected to contact the airline first and attempt to resolve the issue bilaterally. In the event that a satisfactory resolution cannot be found, the complainant can then register their complaint with the Agency and the dispute resolution process is initiated.

In accordance with the Act, all complaints received in this manner are recorded, regardless of whether or not the Agency has a mandate to adjudicate the issue or not. Specifically, the Agency has no mandate to adjudicate airline safety and service quality issues and these are referred to Transport Canada and the airline management for resolution.

Data from the Agency's annual report show that complaints have fallen over the past four fiscal years from a high of 1,352 in 2008/09 to 1,101 in the 2011/12 fiscal year. Complaints dipped to 770 in 2010/11 but increased last year due primarily to a large jump in "Quality of Service" complaints – a category for which the Agency has no mandate. Other than this increase, the overall distribution of complaints into specific categories, however, has generally not changed that much from year to year. Figure 2 shows the distribution of complaints received by the Agency during the 2011/12 fiscal year.

Figure 2: Agency Air Travel Complaint Issues – 2011/12



Source: The Canadian Transportation Agency, Annual Report 2010/11.

Other than complaints concerning quality of service, the categories with an implied level of service component include: flight disruptions, baggage, and denied boarding. These level of

⁷ Although the Agency collects data on the number of complaints received, complainants are directed to address their issues to the customer service departments of the air carriers.

service categories account for just under 40 percent of the total complaints received by the Agency. When complaints over which the Agency has no mandate (e.g. Quality of Service, Safety) are not considered, these three categories account for 74.2 percent of Agency complaints.

2.3 Suggested Indicator Data Set

The selection of a level-of-service indicators data set was based on two main criteria: relevance and practicality. Indicators must be relevant to the air traveller in reflecting issues that are important to them. Complaints to the Agency provide a strong bellwether in this regard. At the same time, the indicator must be practical in that it must be measureable in a consistent, objective and reliable manner – either through proper sampling or by gathering data for the entire population.

Based primarily on the types of complaints received by the Agency over the past three fiscal years, the following are a suggested list of level-of-service performance indicator data set for airline passengers:

Proposed Level-of Service Indicators

Level-of-Service Category	Proposed Level-of-Service Indicator
Flight Disruptions	<ul style="list-style-type: none"> • on-time performance • flight delays • flight cancellations
Baggage	<ul style="list-style-type: none"> • mishandled baggage complaints
Oversold Flights	<ul style="list-style-type: none"> • involuntary denied boarding

Flight disruptions, a complaint category that typically represents between 20 percent and 25 percent of complaints received by the Agency, can be measured by use of the three proposed indicators shown above. Baggage, another important complaint category that accounts for around 20 percent of complaints received can be measured by the number of baggage-related complaints received by the airlines. Oversold flights, which represent less than 5 percent of complaints received by the Agency, can be tracked through the number of reported involuntary denied boarding incidents (i.e., passenger involuntarily bumped from a flight for which they had a reservation).

Other complaint categories are either outside of the Agency's mandate (i.e., quality of service and safety) or do not translate well into objective level-of-service indicators. In short, while these complaint categories (e.g., ticketing) are clearly very important to consumers, they are not practical to measure, track or predict level of service. As a result, they were not included in the list of potential indicators.

2.4 The Complaints Funnel

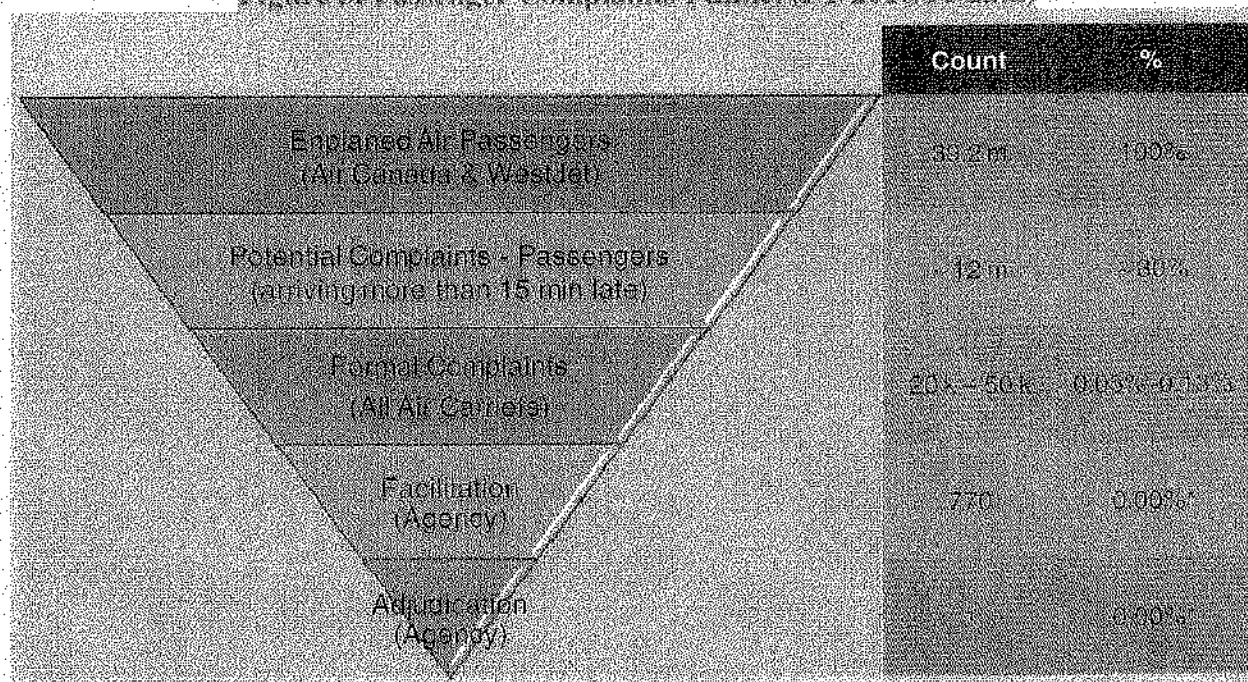
It is evident that not every situation where a passenger's arrival is delayed or a piece of baggage is misplaced results in a formal adjudication involving the Agency Members. In some cases passengers may choose to do nothing or to resolve their dispute directly with the airline. In cases where a formal complaint is lodged with the air carrier, the large majority are resolved by customer service staff. Only a small number involve a facilitated resolution by the Agency and only a small fraction of those result in a formal adjudicated settlement.

In 2010/11, for example, Air Canada and WestJet carried nearly 40 million passengers (see Figure 3). While customer service incidents associated with any of the proposed LOS indicators presented in the previous section holds the potential for a complaint, the most prevalent (i.e., the LOS category that affects the greatest number of passengers) is on-time performance. To provide a rough measure of potential LOS incidents, Agency staff estimate that there were approximately 12 million passengers flying on Air Canada and WestJet that arrived more than 15 minutes late at their destination. This total is around 30 percent of the total passengers flown on the two airlines during this period.

Although air carriers do not publish data on the number of complaints they received, the US Department of Transportation estimates that for every complaint they receive, the air carriers receive around 50.⁸ Although there are significant differences between the two jurisdictions (see Chapter 3.0), applying the same ratio to Canada results in an estimate of approximately 40,000 complaints in 2010/11 or about one-tenth of one percent. In addition, Agency staff report that an Air Canada representative suggested the carrier received around 20,000 complaints annually but this anecdotal report is now dated and was for a single air carrier only. Lacking firm data, a range of between 20,000 and 50,000 annual air passenger complaints to Canadian airlines is not an unreasonable estimate.

What is known with more certainty is the number of complaints received by the Agency. In 2010/11, the Agency registered only 770 complaints from consumers. As a percentage of total passengers enplaned during the same period, these complaints represent only 2 one-thousandths of 1 percent. Finally, only a single adjudication of a complaint was conducted in the same year.

Figure 3: Passenger Complaints Funnel (FY 2010/11 data)



*Although not exactly zero, the calculated percentage is very small

Sources: Canadian Transportation Agency, Statistics Canada, Agency staff estimates

⁸ Gary Stoller, *USA Today*, January 14, 2009 (www.usatoday.com/travel/flights/2009-01-13-air-travel-passenger-complaints_N.htm)

In conclusion, the complaints funnel described above illustrates how the total number of complaints received by the Agency represents only a tiny fraction of the total number of air passengers travelling annually. The vast majority of air passengers complete their journey without incident. Those that do experience an LOS "incident" either shrug it off or file a complaint with the air carrier and reach a settlement.

3.0 The Regulatory Environment

This chapter explores the regulatory environment that domestic and international carriers operate in. Rules and regulations affecting air passengers can influence the behaviour of both consumers and carriers. As a result, a brief overview of the regulatory environment in Canada and in other key jurisdictions is useful in understanding changes in trends or outright structural breaks.

3.1 Canada

In Canada, air passengers are protected by a number of separate pieces of legislation. There is general consumer protection at the provincial level with specific regulations dealing with the travel industry in both Quebec and Ontario. At the federal level, the Canadian Transportation Act (the Act) and associated regulations form the bulwark of protection for air travellers. While protections have been strengthened in recent years, they are arguably less extensive than those in other legislative jurisdictions – particularly in the United States and the European Union (see below).

In 2007, amendments to the Act contained in Bill C-11 included several measures concerning air passenger rights. These measures included explicit authorization for the Agency to offer mediation as an alternative to formal adjudication in resolving complaints concerning air travel. In addition, the Act mandated the Agency to develop regulations requiring air carriers to implement all-in price advertising for air fares.⁹ Finally, Bill C-11 included provisions for increasing awareness of passenger rights under what became known as Flight Rights Canada.

These new Flight Right standards, although not backed by legislation, were designed to strengthen air traveller rights by establishing a code of conduct for airlines and measures to better inform the travelling public of their rights as consumers. *Flight Rights Canada*, published on Transport Canada's website, includes the following key elements:

- Airlines must make reasonable efforts to inform passengers of delays and schedule changes.
- In the event of flight cancellation or over-booking, the airlines must either find a seat for the passenger on a later flight or refund the unused portion of the passenger's ticket.
- When flights are delayed more than 4 hours, the airline must provide passengers with a meal voucher and pay for an overnight hotel stay and transfers if the flight is delayed overnight by more than 8 hours. For tarmac delays in excess of 90 minutes, airlines must offer passengers the right to disembark should circumstances permit.
- With respect to luggage, airlines should unite lost luggage with its owner as quickly as possible and refers to airline tariffs for compensation provided. The airline must also cover the cost of an overnight kit if required and must keep the passenger informed on the status of lost luggage.

Flight Rights further states that the airlines cannot be held responsible for inclement weather, other acts of nature and third party liability (e.g., air traffic control, security agencies).

⁹ This measure was initially delayed as air carriers were concerned that the legislation would put them at an unfair disadvantage relative to international competitors. On December 16, 2011, the Government of Canada announced the coming into force of clause 27 of the Act. The Agency has begun developing the regulations, which are expected to be in place by December 2012.

Unlike some other jurisdictions (notably the European Union and the United States), passenger rights are not enforced through the application of fines for non compliance. Instead, the legislation relies primarily on the airline tariff or conditions of carriage, which are legally binding on the carrier. Passengers with grievances are encouraged to seek redress from the airlines first. Failing that, passengers can contact the Agency for assistance in resolving their dispute.

3.2 Other Jurisdictions

The approach to safeguarding air travel consumers in Canada contrasts sharply to the regulatory environment in other countries, most notably in the European Union and the United States. The approach to consumer protection in both of these jurisdictions involves both regulated standards and the imposition of financial penalties if these standards are not met.

Europe

The European Union (EU) has some of the strongest air travel consumer protection regulation in the world. Legislation and associated regulations provide for specific rules and standards and are backed up with financial penalties for non compliance. There are currently four key pieces of legislation protecting air traveller rights in the EU:

- **Luggage Liability** (2002). Transposed the luggage liability penalties for lost, damaged and mishandled luggage contained in the Montreal Convention into EU Law.
- **Air Passenger Rights** (2004). Established rules for compensation and assistance to passengers in the event of denied boarding, flight cancellations and long delays.
- **Persons with Reduced Mobility** (2006). Established rules on the rights of passengers with reduced mobility.
- **Price Transparency** (2008). Established requirement for presentation of an all inclusive price including the air fare and any taxes, charges, surcharges and fees that are applicable.

Of these, the luggage liability regulations and the Air Passenger Rights (APR) regulations are most germane to the proposed air traveller level-of-service indicator data set presented in the previous chapter. Regulations concerning the maximum penalty for lost luggage are now formally aligned with the Euro equivalent of the Special Drawing Rights (SDR) liability amount contained in the Montreal Convention of 1999. Thus, the European Commission (EC) regulation imposes a maximum liability for lost luggage of €1,200 on operators.

The EC's "Air Passenger Rights" regulation that was enacted in 2005 deals with denied boarding, long delays and flight cancellations. Compensation for involuntary **denied boarding** (bumping due to overbooking) depends on the distance of the flight involved and range from €250 to €600. In the event of a **delay** of more than two hours, passengers are entitled to free meals and two free phone calls or emails. If the delay is overnight passengers are to receive a free hotel room as well as transfers. In addition, passengers on flights with long delays (5 hours or more) have the option of a refund of the full ticket price. Compensation for **cancellations** is applicable if the airline does not provide 14 days advance notice or if the cancellation is not due to extraordinary circumstances.

United States

The United States has air traveller protection legislation that follows an approach that is quite similar to that of the European Union. Areas of consumer protection coverage include the following:

- **Mishandled Luggage.** For luggage that is delayed, passengers negotiate directly with the airline on compensation. Within the United States the maximum liability is currently USD 3,300 for any bag that is declared permanently lost. As of August 2011, the airline must also refund any baggage fee charged.
- **Involuntary Denied Boarding.** Passengers who are bumped involuntarily can request an involuntary refund for their ticket (if they make their own arrangements) and are eligible for compensation unless the airline can find alternative transportation that can get the passenger to their destination within an hour of the original arrival time. Compensation varies between USD 400 and USD 800 depending on circumstances.
- **Tarmac Delays.** Aircraft operating within the United States must provide passengers with adequate food and potable drinking water if the delay exceeds 2 hours and must let passengers disembark if the delay exceeds 3 hours. For international flights the maximum delay is 4 hours. Failure to comply can result in a fine of up to USD 27,500 per passenger unless there are overriding security or safety concerns that trump these rules.
- **Price Transparency.** Airlines, agents and tour operators are required to advertise the full cost of airfares, including all mandatory taxes and fees. This rule became effective in January 2012. Failure to comply can result in a civil penalty for up to \$27,500 for each day that the violation is ongoing.

Compliance with regulations is monitored by the Office of the Assistant General Counsel for Aviation Enforcement and Proceedings. The Aviation Consumer Protection Division also supports consumers by receiving complaints from members of the public and by publishing monthly reports on airline and airport performance against key level-of-service metrics.

It is important to note that while complaints are recorded in official statistics, the Aviation Consumer Protection Division does not facilitate or adjudicate outcomes. Instead, air passengers are generally referred to the air carriers themselves for initial attempts to resolve the complaint. In the absence of a resolution, complainants can attempt to obtain satisfaction through the courts.

4.0 An Assessment of Potential Data Sources

Before building a data set of air passenger level-of-service indicators, an assessment of the available data is required. This chapter explores the available data sources for the proposed air passenger level-of-service indicators. Recall that the proposed indicators are as follows:

- On-time performance
- Flight delays
- Flight Cancellations
- Oversold Flights
- Mishandled baggage

4.1 Canadian Data Sources

Statistics Canada

Statistics Canada publishes a wide assortment of data on a variety of aviation-related topics. The majority of data is survey-based although some population data is available. The data includes aircraft movement (monthly), other operational data such as number of passengers enplaned (monthly) and average airfares (quarterly). Statcan also publishes aviation industry data that includes employment, market share and fuel consumption. Finally, corporate taxation data from Canadian Revenue Agency (CRA) provides the basis for detailed financial statistics. Unfortunately, Statcan does not collect or publish data on level-of-service in general, nor the specific indicators proposed in this study.

Transport Canada

The Aviation Statistics group at Transport Canada is responsible for developing and administering Canada's aviation statistics system. To accomplish this mandate, Transport Canada combines internal data with those obtained from government agencies such as Nav Canada and Statistics Canada along with private sources such as the International Air Transportation Association (IATA) and the Official Airline Guide (OAG). Specific data sources include the following:

- **Operational.** Transport Canada has a number of sources for operational data including eCATS (Electronic Collection of Air Transportation Statistics), AMS (Aircraft Movement Statistics), air carrier financial statements and air traffic data for the top 25 Canadian airports.
- **Origin/Destination Traffic.** Data on passenger market demand by routing is supplied by the IATA Airport Intelligence Service (Airport IS) as well as Statistics Canada surveys (Statement 3). Cargo data is purchased from the IATA Cargo Accounts Settlement System (CASS).
- **Air Carrier Schedules.** Details on scheduled flights are sourced commercially through IATA's Schedule Reference Service (SRS) and OAG Aviation's schedules data.

Transport Canada does not specifically collect or publish data on air carrier level of service.¹⁰ Nevertheless, flight disruption metrics could be constructed using their raw aviation data. For

¹⁰ Transport Canada staff noted that a proposal for collecting a comprehensive set of aviation LOS data was developed under Minister Collenette but was not translated into legislation.

example, air carrier on-time performance could be developed by combining commercial air carrier schedules from IATA and/or OAG (i.e., scheduled departure time) with operational data from eCATS (i.e., actual departure time).

Although disruption metrics could be theoretically obtained from Transport Canada, obtaining these data in practice would involve two main hurdles:

1. **Copyright.** Commercial data is protected by copyright as part of the licensing agreement between Transport Canada and the data supplier (e.g., IATA). Access to this data on an ongoing basis might require some form of cost sharing arrangement with Transport Canada or a direct commercial relationship with the data supplier.
2. **Level-of-Effort.** Estimates of initial development costs were not obtained from Transport Canada but may be significant given that careful matching of records between two or more databases is required. The costs of ongoing data generation costs, however, could be reduced through the creation of automatic routines or macros.

These obstacles are clearly not insurmountable but will require a feasibility study to prepare an estimate of initial development as well as ongoing data collection costs. These costs can then be compared to the benefits that would accrue to the Agency of having ready access to the proposed air passenger LOS indicators.

Air Carriers

While the major airlines in Canada would certainly collect data on the proposed level-of-service indicators, WestJet is the only major Canadian airline that publishes some of these indicators on a regular basis. Air Canada did, at one point, publish quarterly on-time arrival performance statistics on its website. However, it has not done so since the first quarter of 2012. In presenting the data, Air Canada compared its results against the on-time arrival performance of major U.S. carriers published by the U.S. Department of Transportation Bureau of Transportation Statistics (BTS). In addition, it is unclear if the data published was only for Air Canada's domestic operations (in line with the BTS data set) or (more likely) it represents all of Air Canada's operations – both domestic and international.

The major airlines in Canada do collect data on at least some of the proposed level-of-service indicators. For example, both Air Canada and WestJet collect and publish their on-time arrival performance.¹¹ In the case of Air Canada, this indicator is published quarterly on its website. In presenting the data, Air Canada compares its results against the on-time arrival performance of major U.S. carriers published by the U.S. Department of Transportation Bureau of Transportation Statistics (BTS).

The Air Canada on-time arrival data is for a single quarter only and is replaced with the latest quarter's data when it becomes available. It is unclear when the data is changed by Air Canada staff so ongoing monitoring of the site would be required to build a time-series that could be used for analysis. In addition, it is unclear if the data published is only for Air Canada's domestic operations (in line with the BTS data set) or (more likely) it represents all of Air Canada's operations – both domestic and international.

WestJet publishes its on-time arrival performance along with baggage rate (number of mishandled baggage complaints per 1,000 enplaned passengers) and flight completion rate. The

¹¹ No published data was found for other scheduled air carriers such as Jazz or Air Transat or Porter Airlines.

data has been included in its quarterly financial report since 2008 and represents the average of its monthly performance. Although seasonal patterns can be identified, the time series only goes back to 2007 so it is difficult to discern the impact of longer term factors such as the business cycle.

In addition to the publicly available data described above, Canadian air carriers undoubtedly collect additional data to support their operational goals. Although the specifics of this data cannot be determined conclusively without contacting the air carriers directly, there is a very high likelihood that most – if not all – of the proposed LOS metrics are included in the data set. Nevertheless, air carriers are unlikely to provide this information voluntarily.

Summary of Canadian Data Sources

There is little in the way of publicly available level-of-service data in Canada. Neither Statistics Canada nor Transport Canada collect or publish air passenger level-of-service indicators. Although Transport Canada has a database on aircraft arrivals and departures based on carrier flight information, significant effort could be required to turn this data into useful indicators.

~~Although some LOS metrics – principally arrival performance – is provided by the airlines themselves, there are significant deficiencies. Most airlines do not publish LOS metrics on their own volition. Only WestJet publishes accessible data but these are presented in frequencies (e.g., quarterly and annual averages) that do not lend themselves well to analysis. Air Canada's quarterly arrival performance data is no longer published on its website, presented for the previous quarter only and is replaced as soon as the new quarters results become available.~~

4.2 Other Sources

The two main jurisdictions assessed for available air passenger level of service indicators were the European Union and the United States. Two key industry organizations that publish level-of-service performance indicators were also included.

European Union

Despite strong consumer protection rules, there are surprisingly few sources of level of service indicators for the European Union. Staff was unable to locate any official published data on lost luggage, tarmac delays or flight cancellations for example.

Nevertheless, the European Commission does publish extensive data on air traffic and delays through Eurocontrol, the agency responsible for air navigation safety in Europe. Delays in departure and arrival are provided monthly as reported by the airlines. This data is designed for use in air traffic management efficiency studies as well as analysis of airport and airspace capacity.

Some data is published by national organizations within the EU. For example, the Air Transport Users Council published data on air passenger level of service in the United Kingdom (UK) and more broadly in Europe. However, the Council was disbanded in 2011 and the practice of publishing level-of-service indicators has not been continued by the UK Civil Aviation Authority, the government body that took over dealing with air passenger complaints.

The Association of European Airlines (AEA), an industry association made up of 36 European airlines, also released selected level-of-service indicators in their quarterly consumer report.¹² Data on the number of mishandled baggage as well as delay and cancelled flight statistics were supplied by its individual members. Unfortunately, publication of the AEA consumer report was discontinued in 2009.

In conclusion, official sources in the European Commission and EU member states do not provide a good source of level-of-service indicators on air travel. Nevertheless, there are a number of private organizations that furnish selected air passenger level-of-service data (see Industry Data below) with European coverage.

United States

The US, through the Office of Aviation Enforcement and Proceedings Aviation Consumer Protection Division, offers what is arguably the richest data set of air travel level of service indicators. Using data supplied by the Bureau of Transportation Statistics, the Aviation Consumer Protection Division and the Department of Homeland Security the monthly on-line publication reports on airline and airport performance – the Air Travel Consumer Report. Level-of-service indicators include those concerning flight delays, mishandled baggage, oversales, the number of consumer complaints and airline animal incident reports.

With the first publication dating back to 1998, this data source offers a time series for some indicators of more than 150 observations. As a result, both short term and long-term trends can be observed. More importantly for our purposes, the report covers all of the proposed air passenger level-of-service indicators presented in Chapter 2.

That said, the data are only for larger domestic US airlines flying domestic routes (i.e., arrival and departure airport are within the US). Foreign carriers flying to and from the United States as well as US carrier international operations are not included.

Industry Data

In addition to government sources, there are several private organizations that either publish their own aviation-related data or repackage data from other sources. Two key organizations in this regards are Flightstats and SITA.

Flightstats (www.flightstats.com) provides online users with “near real-time” flight tracking capability and airport delay information.¹³ The site also publishes data on delayed and cancelled flights in North America, Europe and Asia-Pacific. Flightstats data is daily in frequency and can be sorted by airline, flight and airport. Unfortunately, published data is only available for the 30 preceding days. As a result, ongoing monitoring of the data would be required to build a useable time series.

Another organization that gathers and publishes level-of-service data is SITA (www.sita.aero), a private firm owned by several large air industry companies and specializing in air transport communications and information technology solutions.¹⁴ Working closely with the International

¹² See for example, Association of European Airlines, Consumer Report – Winter 2008/09 (<http://files.aea.be/News/PR/Pr09-016.pdf>).

¹³ Flightstats claims to provide definitive information for approximately 99.5 percent of U.S. flights, and better than 86 percent of flights worldwide.

¹⁴ Société Internationale de Télécommunications Aéronautiques (SITA) was founded in 1949 by 11 major airlines and now has more than 500 members worldwide.

Air Transport Association (ATA), SITA has developed baggage management systems that are used by many airports and airlines around the world.¹⁵ Based on the data collected by their system, they publish an annual report on the state of the world's mishandled baggage. The data that is published, however, is annual in frequency and this makes short-term or seasonal trends impossible to discern.

JD Power and Associates – famous for their car rating satisfaction surveys – also conduct an annual customer satisfaction rating survey for airline passengers. Similar to their other surveys, this market research company provides few details on their survey methodology or on the instrument used. As a result, it is difficult to ascertain the quality of the survey results. Similar to the SITA data described above, the survey is conducted annually, resulting in the same limitations with respect to masking seasonal patterns or allowing analysis alongside other quarterly or monthly data. Furthermore, the survey rates the air carriers in seven categories that are focused on customer service and are more qualitative in nature.¹⁶ Consequently, the survey results cannot be directly correlated with any of the proposed LOS indicators.

Nevertheless, Air Canada and WestJet are both included in the JD Power and Associate survey – Air Canada among “traditional” (i.e., legacy) air carriers while WestJet is included with other low-cost carriers. So while this type of customer satisfaction data is of limited use for air passenger LOS indicator analysis, the results do provide insights into how these two Canadian air carriers stack up against their US counterparts.

Air Canada has scored well in the traditional air carrier segment, coming in second to Alaska Airlines in both of the past two years. In the 2012 survey, Air Canada received a customer satisfaction score of 677 (out of a total of 1,000), just a single point behind Alaska Airlines. WestJet meanwhile, came in third to Jet Blue and Southwest with a customer satisfaction score of 733. Overall, JD Powers reported a modest downward trend in air passenger customer satisfaction, despite improving LOS indicators reported by the US BTS. This result reinforces the lack of correlation between the two different types of measures.

4.3 Summary

Although Statistics Canada does publish data on air traffic and on the air industry in general, there are no official sources of data on air passenger level-of-service. Air Canada and WestJet does publish their own set of level-of-service indicators but these data sets only cover a small sub-set of indicators and do not provide enough data points for a useful time series. As a result, data from other jurisdictions was examined to see what other sources might be available.

Europe, with some of the strongest air travel consumer protection rules in the world, does not have reliable published data on level-of-service indicators. However, Eurocontrol does publish monthly reports on the airline and airport delay using data provided by the airlines. Nevertheless, published data from the European Union or its member states is not currently a viable alternative source of data for the purposes of this study.

Private organizations also provide some level-of-service indicators online. Flightstats, for example, publishes data on flight delays and cancellations in North America, Europe and Asia.

¹⁵ SITA states that its baggage management system is used by more than 100 airports and 450 airlines worldwide.

¹⁶ The categories assessed include: the cost of tickets and fees; in-flight services; boarding, deplaning and baggage; flight crew; aircraft; check-in; and reservations.

SITA, a company that supplies luggage management systems, provides data on mis-handled baggage. Neither source provides sufficient coverage to meet the stated needs of this study.

This lack of data is not mirrored in the United States where the Bureau of Transportation Statistics (BTS) collects and publishes a wide assortment of level of service data for major carriers serving the domestic market. Given the scope and coverage of the BTS data set, it is hoped that it may provide useful insights concerning the level-of-service for passengers in Canada. As a result, the indicators published by the BTS will be used and compared – where possible – to known Canadian sources.

5.0 Level of Service Indicators

This chapter presents the level-of-service indicators, drawing primarily on data from the US Bureau of Transportation Statistics. The indicators presented are as follows:

- On-time performance;
- Flight delays;
- Flight Cancellations;
- Oversold Flights; and
- Mishandled baggage.

A Note on Data Quality

Before examining the data published by the US Department of Transportation it is worth pausing to consider the quality of the data. While systematic data quality issues have not surfaced in recent years,¹⁷ the majority of the data are reported by the airlines themselves. Even with the advent of systems that automatically record critical operational data (e.g., ACARS), over 8,000 separate reports are collected from domestic and international carriers, entered into databases and then subjected to edit and validation procedures.

Data quality can also be subject to manipulation by air carriers. Recognizing chronic bottlenecks on some routes, the padding of schedules is now common practice among some U.S. carriers. A 735 mile flight from Newark, New Jersey to Atlanta Georgia that typically involves a flying time of 1 hour and 40 minutes was recently scheduled by one carrier at 2 hours and 43 minutes.¹⁸ Of course, this particular flight must fly through some of the most congested airspace in the United States, but it highlights the issue of padding schedules to reduce the frequency and severity of delayed flights.

Another example of a data quality issue is associated with air carriers changing flight numbers. Since flight delays are tracked by unique flight number, any changes to flight numbers means that specific flights can avoid being cited as poor performers. To counter this issue, the BTS now requires airlines to report data on flights together if the flight number changes but the departure times are within 30 minutes of each other.

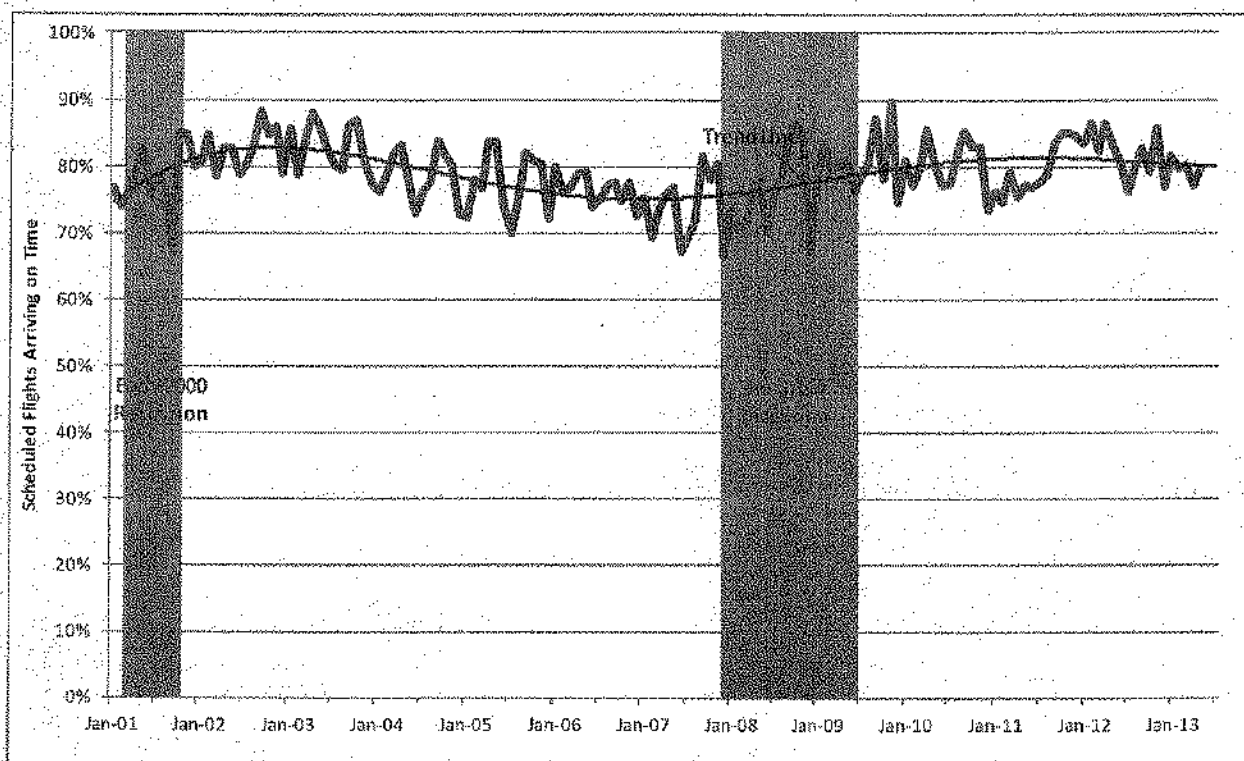
5.1 On-Time Performance

On-time performance is consistently ranked on or near the top of level of service needs by air passengers and figures prominently in most complaint statistics. Factors affecting on-time arrival performance include weather, airspace congestion and aircraft turnaround times among other factors. Figure 4 shows monthly on-time arrival performance for U.S. carriers on domestic routes between January 2001 and June 2011. Following BTS standards, an aircraft is deemed to be "on time" if aircraft arrives at the gate within 15 minutes of the scheduled arrival time.

¹⁷ Originally, airlines set their own definitions of arrival and departure times until the DOT set up operational definitions for recording these data.

¹⁸ McCartney, S., "The One Airport to Avoid Is...", *The Wall Street Journal*, August 4, 2011.

Figure 4: Average On-Time Arrival Performance – U.S. Major Air Carriers



Source: Aviation Consumer Protection and Enforcement, *Air Travel Consumer Report*
(<http://airconsumer.ost.dot.gov/reports/>)

The data clearly display seasonal patterns, with frequent sharp declines in on-time arrival performance during the busiest travel times of the year – the summer and winter vacation seasons. In any given year, the swing in on-time arrival performance can decline as much as 15 percentage points during peak travel periods.

In addition, the series displays a long-run cycle that tracks the economic business cycle. This has been highlighted in the chart by fitting a polynomial trend line to the data. Economic growth is a key driver of demand for air travel (see Appendix B).¹⁹ An improving economic climate over the business cycle will result in a decline in the on-time arrival performance as airport and air space capacity constraints and other bottlenecks become more prevalent. Recessionary periods (shaded regions in the chart), therefore, will usually precede a period of strengthening on-time performance as the number of aircraft movements declines and capacity constraints ease.

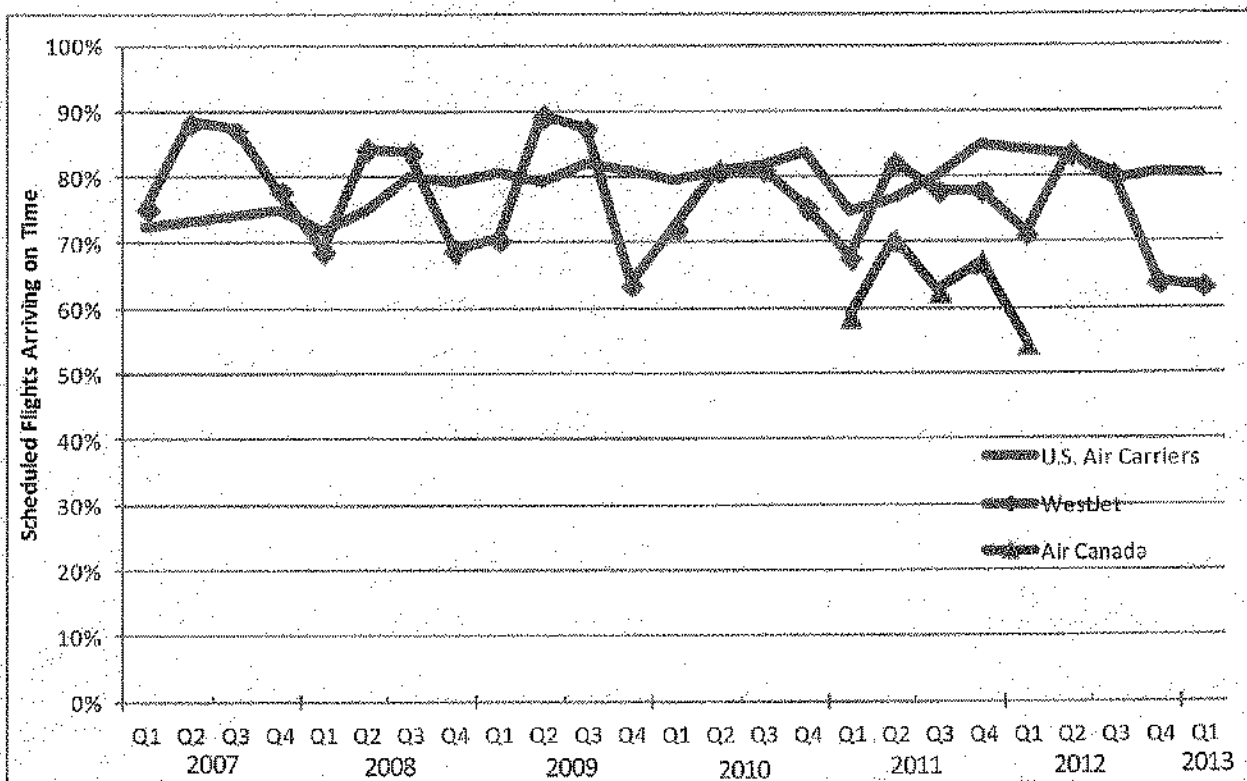
Although certain carriers seem to have consistent issues with on-time scheduling, there is no strong evidence of correlation between performance and whether the air carrier is a legacy or low-cost carrier. Southwest Airlines – a well-known low-cost carrier that WestJet is modeled after – is found in the middle of the pack along with American Airlines. In 2012, Hawaiian Airlines (a legacy carrier) was first overall with a 93.4 percent on time arrival and the worst was ExpressJet (a low cost carrier) with 76.9 percent.

¹⁹ Chèze B., Chevallier, J. and Gastineau P. *Forecasting world and regional air traffic in the mid-term (2025): An econometric analysis of air traffic determinants using dynamic panel-data models*, January 2011, pg. 10.

Comparisons to Canadian Data

Although there is no comprehensive data source for all Canadian carriers, both Air Canada (for a short period of time) and Westjet release their on-time arrival statistics, and their reporting follows the US BTS methodology. Figure 5 displays that WestJet's on-time arrival performance tracks well against the average for the US domestic airlines over the past six years for which WestJet's data is available.

Figure 5: Average On-Time Arrival Performance (Canadian v. U.S. Carriers)



Sources: Aviation Consumer Protection and Enforcement, *Air Travel Consumer Report* (<http://airconsumer.ost.dot.gov/reports/>)

WestJet Quarterly Financial Reports (www.westjet.ca)

Air Canada On-Time Performance Internet Site (<http://www.aircanada.com/en/about/atp/index.html>)

Air Canada at one point published its on-time arrival performance but only displayed for the most recent quarter (i.e., no time series is available publicly). In the first quarter of 2012, Air Canada's on-time arrival performance was 54.8 percent, placing it dead last out of the 17 airlines reporting for the quarter. Air Canada's on-time arrival performance was near the bottom against its US comparators for the five quarters for which data is available. Nevertheless, the small number of observations makes it difficult to draw any definitive conclusions concerning Air Canada's on-time arrival performance.

5.2 Flight Delays

Flight arrival or departure times can be challenging to define as there are many potential candidates to benchmark against. For example, the time of departure could be when the aircraft pushes back from the gate, when the flight crew receives permission to taxi from the tower or

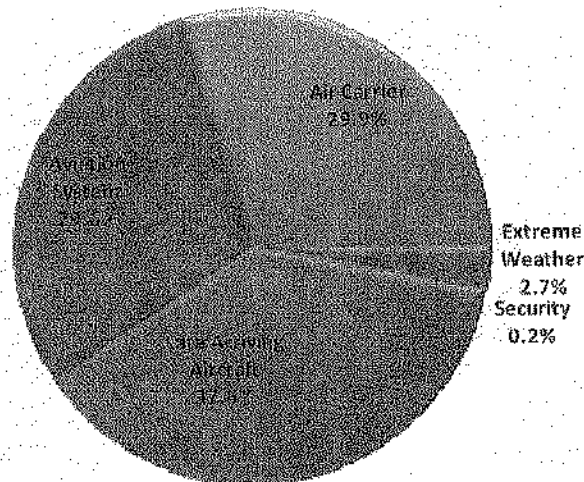
when the aircraft's wheels actually leave the ground. Depending on the circumstances, there could be a significant difference between these times.

Despite this, there is still important information to be gained by looking at the reasons for the delays. Again, there is limited data on flight delays in Canada so other jurisdictions must be used to examine trends. Fortunately, both Europe and the United States publish comprehensive air carrier delay data. Of the two, the U.S. represents perhaps an overall better match with Canada's air transportation system, given the distances travelled and lack of meaningful long haul modal competition (for example Europe's well-developed passenger rail service).

Figure 6 presents the BTS main cause of departure delay (here the scheduled time is the time that the aircraft pushed back from the gate) for major U.S. carriers over all of 2012. The definitions for each cause are as follows:

- **Air Carrier Delay.** The cause of the cancellation or delay was due to circumstances within the airline's control (e.g. maintenance or crew problems, etc.).
- **Extreme Weather Delay.** Significant meteorological conditions (actual or forecasted) that, in the judgment of the carrier, delays or prevents the operation of a flight.
- **National Aviation System Delay.** Delays and cancellations attributable to the national aviation system refer to a broad set of conditions -- non-extreme weather conditions, airport operations, heavy traffic volume, air traffic control, etc.
- **Security Delay.** Delays caused by evacuation of terminal or concourse, re-boarding of aircraft because of security breach, inoperative screening equipment and long lines in excess of 29 minutes at screening areas.
- **Late Arriving Aircraft Delay.** Previous flight with same aircraft arrived late which caused the present flight to depart late.

Figure 6: Main Cause of Delay – U.S. Major Air Carriers (2011)



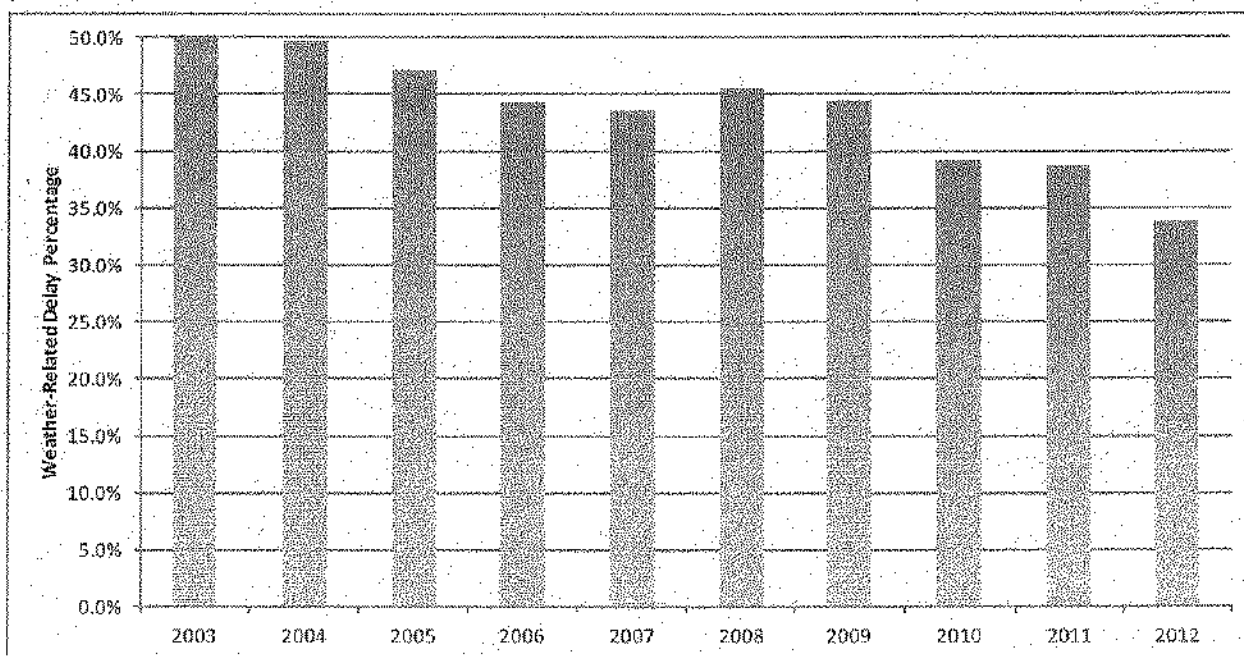
Source: Aviation Consumer Protection and Enforcement, *Air Travel Consumer Report*
(<http://airconsumer.oast.dot.gov/reports/>)

In aggregate, the data suggest that three causes – Air Carrier, Aviation System and Late Arriving Aircraft, are responsible for nearly 97 percent of the delays. By eliminating the Late Arriving Aircraft category, which provides no insights on the underlying reason for the delay, the two

primary causes for all delayed departures in the U.S. are split almost equally between carrier-related or aviation system related causes in almost equal proportion.

It is important to note that while "extreme" weather was attributed as the cause for around 3 percent of the cases reported by air carriers to the US BTS, this result does not reflect the overall impact of weather on aircraft delays. Weather remains the single most important causal factor in aircraft flight delays in most jurisdictions including the United States. For example, the BTS estimates that around 75 percent of delays recorded under the "aviation system" category are weather related. A clearer picture emerges when delays due to extreme weather and weather-related aviation system delays are combined. Figure 7 shows that in 2012, 33.7 percent of scheduled aircraft delays in the United States were due to weather – either extreme weather or weather-related aviation system delays.

Figure 7: Flight Delays Due to Weather in the United States



*Data from June 2003 through December 2003 inclusive

Source: Aviation Consumer Protection and Enforcement
(http://www.bts.gov/OT_Delay/OT_DelayCause1.asp?cat=1)

One causal category that is not categorized in the official delay data is related to labour relations. With extremely tight schedules, it does not take much to create initial delays that can cascade through the system. If an air carrier's staff is not completely engaged for whatever reason, delays can easily result. A more extreme example of this occurred when many Air Canada pilots called in sick on the same date following passage of back-to-work legislation. Although very difficult to accurately measure, this "withdrawal of enthusiasm" on the part of staff can have a striking impact.

Comparisons to Canadian Data

Unfortunately Staff was unable to obtain published Canadian data on the causes of delay, either from official sources or published by the airlines. Extrapolating the US BTS data to Canadian

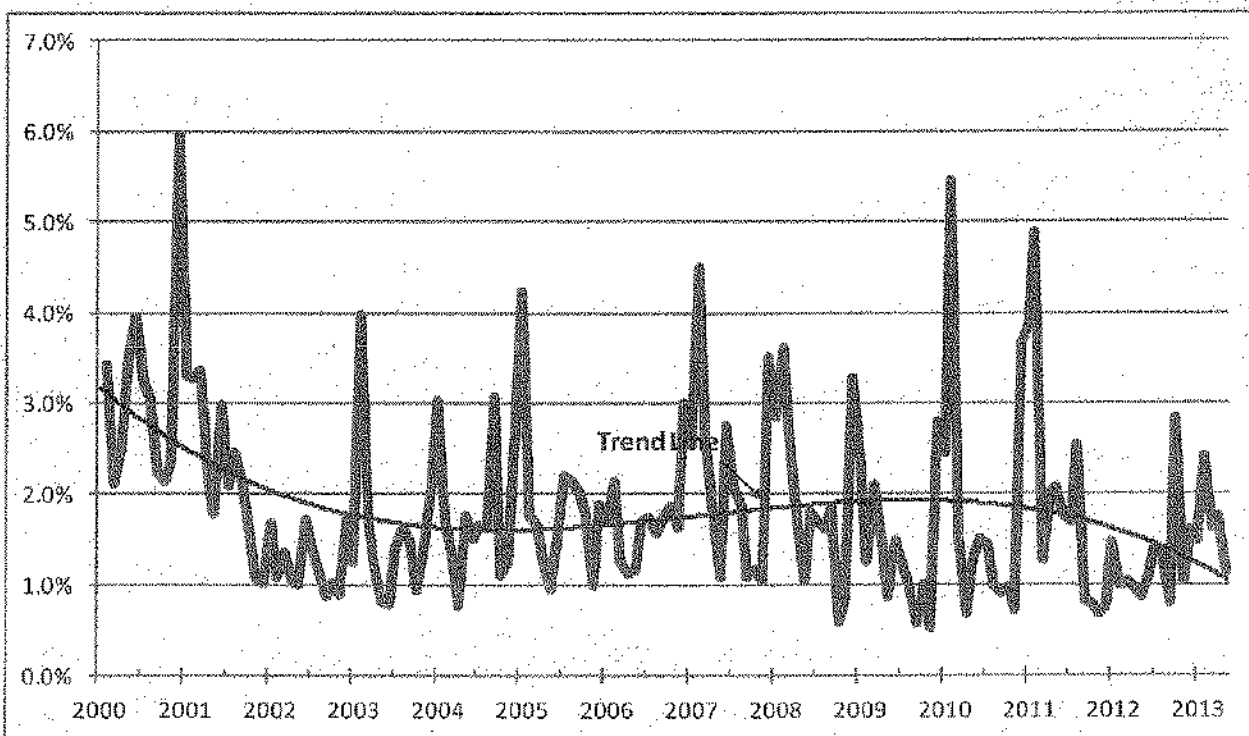
airspace cannot be attempted without a strong scientific basis for making the comparison. Key differences in many key aspects of the aviation systems between Canada and the United States (e.g., air navigation systems, air traffic control regulations, airspace congestion, weather) make comparisons between the two countries extremely challenging.

5.3 Flight Cancellations

Flight cancellations are the third flight disruption level-of-service indicator and represent perhaps the most extreme form of disruption to the passenger. This is because although a delay can be extremely inconvenient and disruptive to travel, the passenger retains a seat. A cancellation on the other hand results in the passenger losing their seat as the airline attempts to find space for them on a later flight.

As with the other flight disruption data, the U.S. Bureau of Transportation Statistics collects cancellation data from U.S. carriers flying domestic routes. These data are presented in Figure 8 below.

Figure 8: Flight Cancellations – U.S. Major Air Carriers



Source: Aviation Consumer Protection and Enforcement, *Air Travel Consumer Report*
 (<http://airconsumer.ost.dot.gov/reports/>)

As with the on-time arrival data, cancellations display a pronounced seasonal pattern, with spikes during the winter months as high traffic demand and inclement weather can result in severe disruptions. The summer travel period can also see an increase in flight cancellations but this seasonal effect is less pronounced.

Longer run trends are less easy to identify with flight cancellations data. While the data presented in Figure 8 suggest a downshift following September 11, 2001, there is also pronounced cyclical component that is correlated with the business cycle (indicated by the

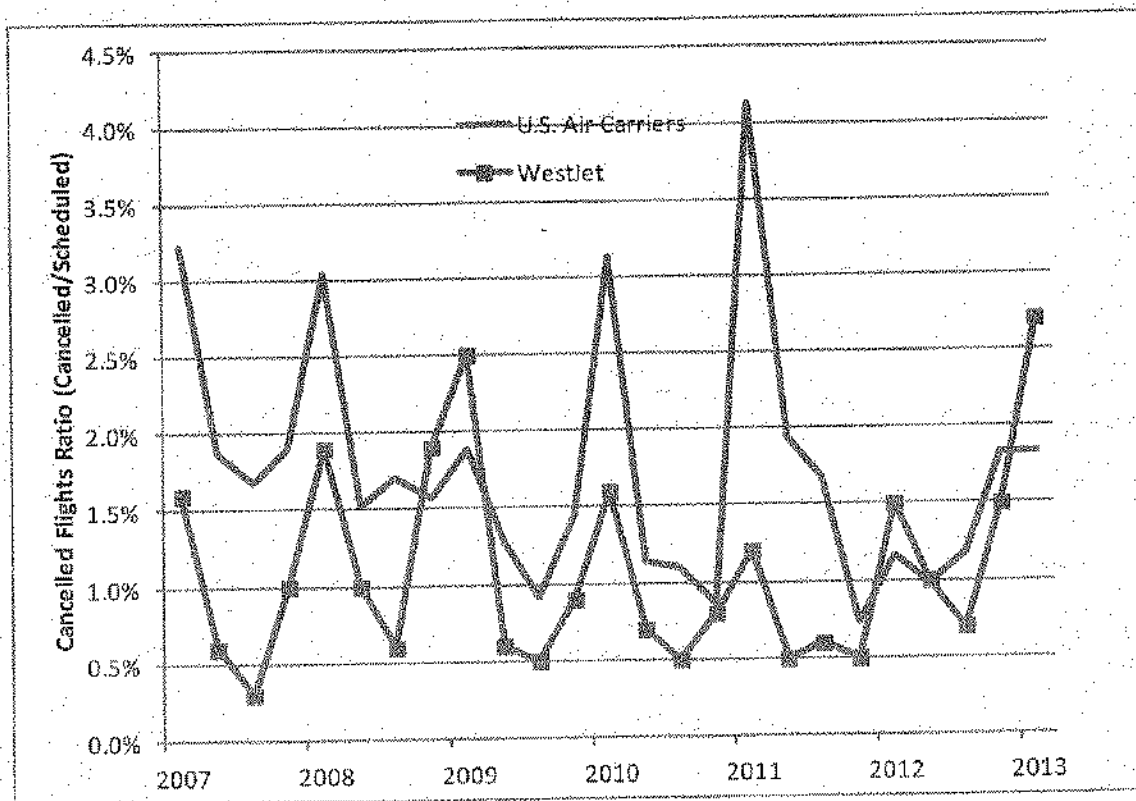
polynomial trend line). The influence of the business cycle on flight cancellations is further borne out by examining trends in annual data that date back to 1995 (not shown here).

Finally, it is worth pointing out that recent regulatory changes may be impacting the rate of flight cancellations. Rules governing air carriers in the U.S. that came into force on April 1, 2010 have severe penalties for tarmac delays of greater than 3 hours (4 hours for international flights). As a result, there may be a financial incentive for airlines to cancel flights that are in danger of breaching this threshold and avoid a possible fine of up to USD 27,500 per passenger. While the number of tarmac strandings in excess of 3 hours has fallen dramatically in the year since the rule was put in place (from 693 to 20), the number of cancellations has increased modestly. Given the volatility in the cancellations data, however, it is difficult to attribute direct causality to the change in regulations.

Comparisons to Canadian Data

Canada lacks an official source of cancellation data but WestJet does publish quarterly data on what its financial statement refers to as a "completion rate". The completion rate, measured in accordance with the BTS methodology, represents the rate of completed flights relative to those scheduled. Figure 9 compares quarterly data from U.S. carriers on domestic routes to WestJet between 2007 and 2013.

Figure 9: Flight Cancellations (Canadian v. U.S. Carriers)



Sources: Aviation Consumer Protection and Enforcement, *Air Travel Consumer Report* (<http://airconsumer.dot.gov/reports/>)
 WestJet Quarterly Financial Reports (www.westjet.ca)

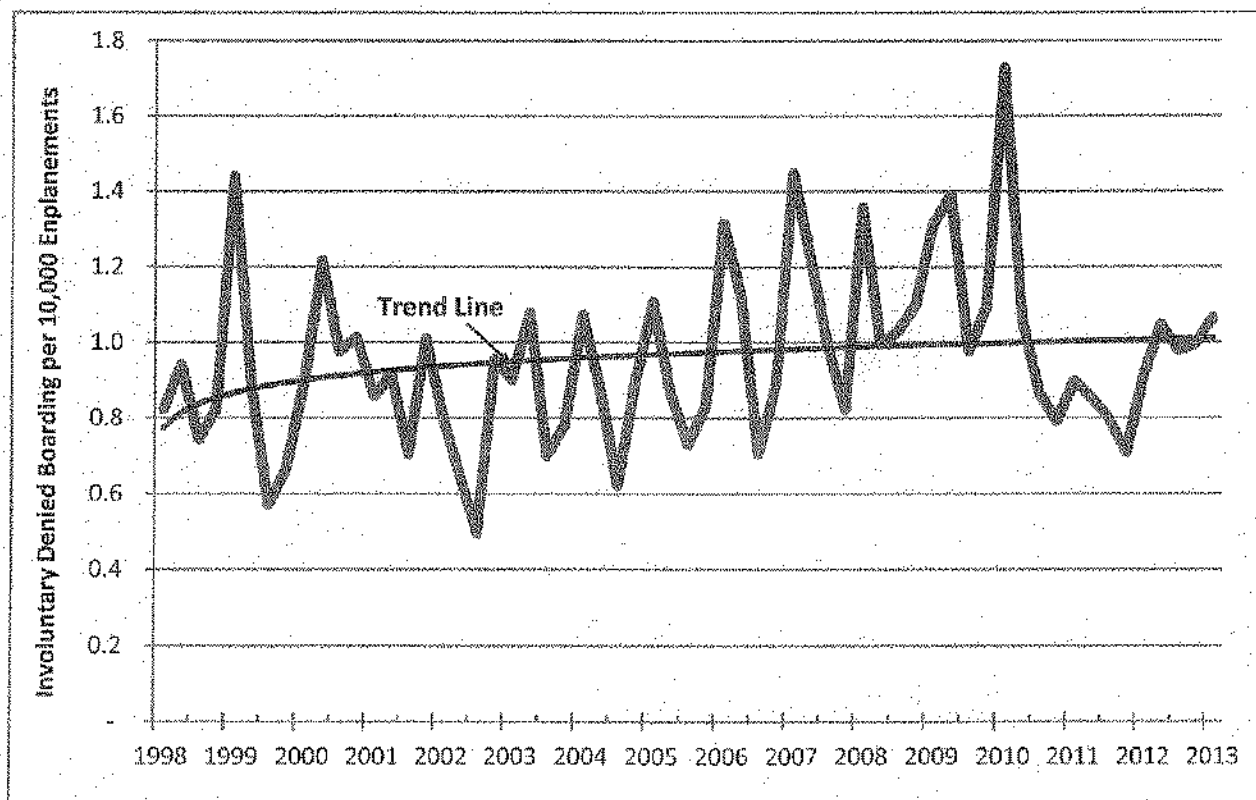
Overall the WestJet cancellation data are highly correlated with those of U.S. carriers with annual peaks in the winter when high demand and winter storms can create havoc with schedules. For the most part, WestJet's cancellation rate is lower than the average (mean) of U.S. carriers flying domestic routes. In the second quarter of 2011, for example, WestJet's rate of 0.5% compared favourably with that of Continental, which had the lowest cancellation rate of any major U.S. Carrier at 0.3%.

Air Canada does not publish data on the number of its flights that are cancelled. That said, its results are likely to be at least somewhat correlated with the US BTS results, with spikes occurring during winter months. Unfortunately, Agency staff were unable to determine where overall results for Air Canada would land with respect to WestJet or US carriers.

5.4 Oversold Flights

The number of passengers bumped (either voluntarily or involuntarily) can be generally linked to airlines attempting to maximize passenger revenue per kilometre flown. Although some airlines have a policy that precludes overbooking flights (examples include WestJet in Canada and JetBlue in the U.S.), the majority of airlines in the United States follow the practice. Overbooking flights is a hedge against passengers who don't honour reservations (primarily business passengers who may reserve several options for their trips to allow more flexibility in departure times) but also allow the airline to collect additional revenue if a prepaid passenger doesn't show up.

Figure 10: Involuntarily Denied Boarding "Bumped" – U.S. Major Air Carriers



Source: Aviation Consumer Protection and Enforcement, *Air Travel Consumer Report*
 (<http://airconsumer.ost.dot.gov/reports/>)

The rate of passengers being bumped on domestic U.S. flights (number of involuntary denied boarding relative to enplaned passengers) is presented in Figure 10. Although there are pronounced seasonal fluctuations in the data, a slight upward trend can be observed. This upward trend in passengers bumped from flights is also reflected in an increase in load factors as airlines attempt to boost their revenue per passenger mile (RPM) flown. Over the past 20 years, load factors on domestic routes in the U.S. have steadily increased from 60.5 in 1990 to 82.34 in 2012.

While the rate of passengers involuntarily bumped from flights in the U.S. has certainly risen, so has the rate of passengers that voluntarily gave up their seats and accepted a later flight (usually along with some form of compensation). The rate for voluntarily bumped passengers in 2012 was around 10 times as great as those involuntarily bumped (8.97 per 10,000 enplaned passengers compared to 0.99 for involuntarily denied boarding).

Another factor that contributes to passengers being bumped is greater use of smaller narrow-bodied commuter aircraft.²⁰ The lack of tolerance of these smaller aircraft for extra weight can result in a "bulk out" – removal of passengers and/or baggage to ensure compliance with maximum takeoff weight restrictions. This issue is particularly relevant in the winter when extra fuel may be required and passengers generally board with heavier winter clothing. While the impact of using regional jets on bumping passengers is certainly less important than corporate policy on overbooking, some of the airlines that have the highest rates of bumping in the U.S. are regional carriers such as Comair and Atlantic Southeast (both Delta connectors).

In addition to rising load factors and bulk outs, the influence of regulation must be factored in. ~~Ne rules introduced by the U.S. DOT in 2010 that increases compensation due to passengers who are involuntarily bumped is unclear at this point. While rates have fallen since the peak in the first quarter of 2010, overall rates are still much higher than historic lows of the past decade.~~ New rules introduced by the U.S. DOT in 2010 that increase compensation due to passengers who are involuntarily bumped seems to have reduced the average number passengers who are involuntarily denied boarding. Although when viewed over a longer time period, it is less clear that the new rules have had the desired effect.

Comparisons to Canadian Data

Unfortunately there are no Canadian data on the number of passengers denied boarding, either from official sources or published by the airlines. ~~In the absence of such data, however, is it possible to estimate a range of possible values that Canadian data might take on?~~

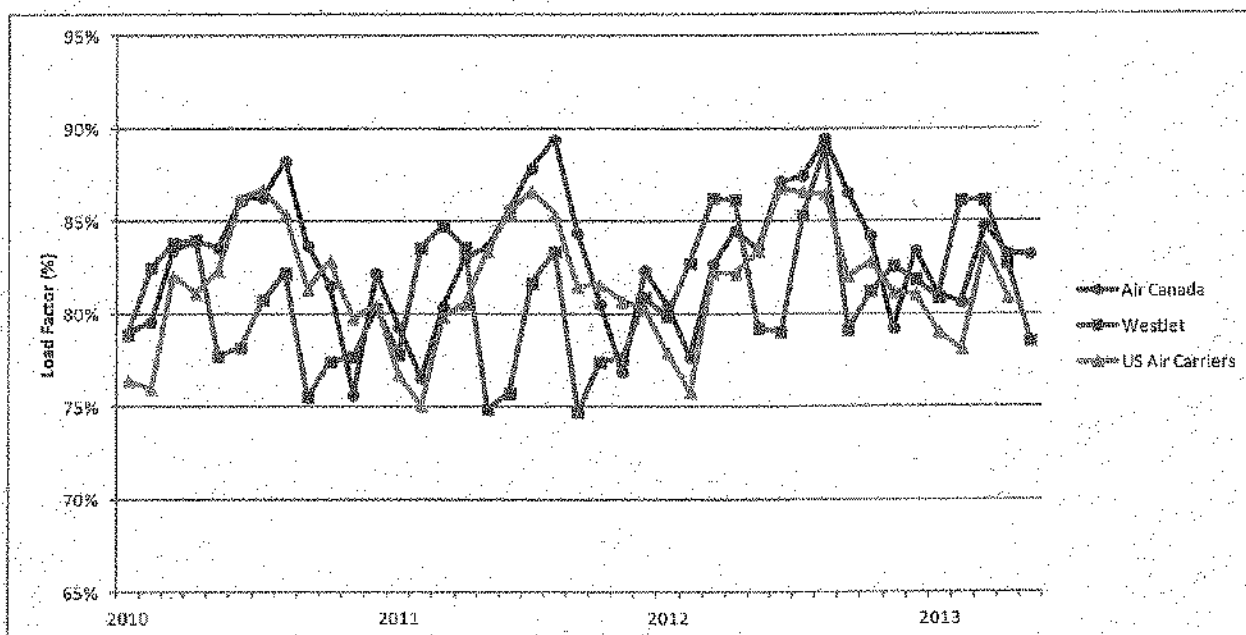
~~As mentioned earlier, the majority of US air carriers practice overbooking in an effort to reduce the number of empty seats on their flights. In Canada, Air Canada practices overbooking while WestJet has a stated policy of not overbooking its flights. In terms of total enplaned passengers, WestJet is clearly more dominant in the Canadian market than JetBlue (the sole US air carrier that does not overbook its flights) is in the United States. On this basis, therefore, it would appear that the odds of being "bumped" are likely somewhat higher in the United States than in Canada.~~

²⁰ Narrow-bodied regional jets such as the Bombardier CRJ or the Embraer E-jets were originally designed for short-haul commuter service – with 2x2 seat configuration and limited overhead bin storage. Their medium haul range of over 1,800 nautical miles has meant that they are now being used on major trunk routes that were previously serviced by wide-bodied aircraft such as the Boeing 737 or Airbus 320.

Another factor that might influence the probability of being "bumped" involuntarily is the load factor of aircraft in the two countries. Load factor is a measure of aircraft occupancy that compares the number of revenue passenger miles (or kilometers) with the number of available passenger miles (or kilometers). Based on data from 2011 and the first quarter of 2012, the load factors for both Air Canada and WestJet roughly match those of US air carriers (see Figure 11).

Historically the rates of involuntarily denied boarding to passengers in the United States have varied from a low of 0.50 per 10,000 enplaned passengers during the summer of 2002 to a high of 1.73 in the first quarter of 2010. More recently (for the period from the 2011 first quarter to through the first quarter of 2013), US air carriers reported a range for involuntarily denied boarding of between 0.71 and 1.06 per 10,000 passenger enplanements.

Figure 11: Load Factors - Major Air Carriers in U.S. and Canada



Sources: Bureau of Transportation Statistics (http://www.bts.gov/Data_Elements.aspx/Data=5)

Statistics Canada CANSIM Table 401-0043

(http://www5.statcan.gc.ca/cansim/a26?lang=eng&redLang=eng&id=4010043&par=1&pattern=&stByVal=1&p1=1&p2=1&subMed=dataTable&c_sid=1)

When estimating ranges for Canadian "bumped" passenger rates, it is important to consider the full time period of a business cycle (i.e., distinguish between cyclical fluctuations and long-term trends). The most recent data on load factors, for example, occurred during a period of weak demand in both Canada and the United States. Taking this into account, data for Air Canada and WestJet involuntary denied boarding is likely to range from 0.50 to 1.40 per 10,000 passenger enplanements. This range accommodates approximately 95 percent of the quarterly US observations historically.

5.5 Mishandled Baggage

Since there is no official data on mishandled baggage rates for Canada, Figure 12 presents the mishandled baggage data for U.S. carriers flying on domestic routes. Mishandled baggage rates

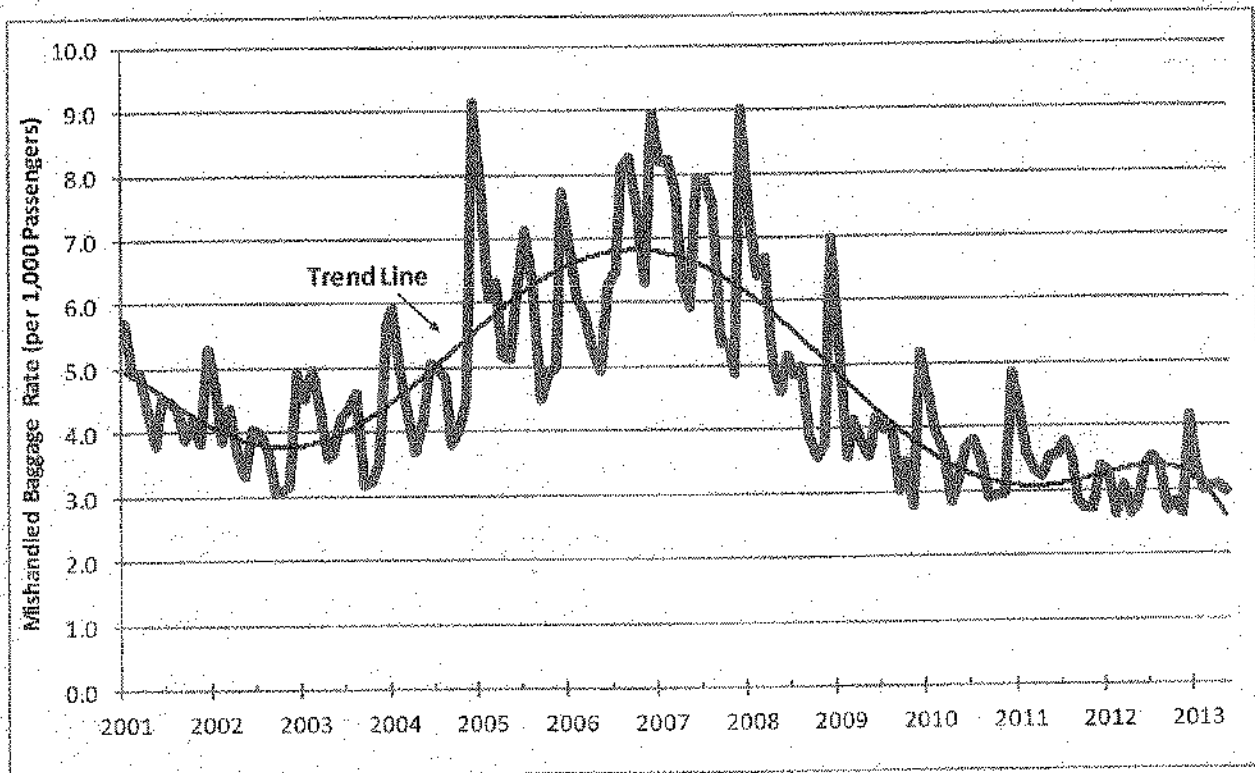
published monthly by the BTS represent the number of mishandled bags per 1,000 enplaned passengers.

Similar to on-time performance, rates of mishandled bags are strongly correlated with flight operations (air traffic movements, enplaned/deplaned passengers). Capacity constraints with respect to baggage management systems and processes show strains during peak travel periods and when severe weather sets in. As a result, when these factors combine during the busy December travel season, mishandled baggage rates for the airlines generally spike.

While the data follow a cyclical pattern, there has been a long-term downward trend. In February 2012, the baggage rate of 2.64 per thousand enplaned passengers was the lowest since the DOT began keeping records back in 1987.

Baggage management is also directly affected by changes in security regulation. Since 9/11, there have been a number of restrictions placed on what can be taken on board an aircraft in the United States. In August of 2006, for example, the TSA ordered that liquids were no longer permitted in the cabin. The increase in checked baggage that resulted was cited as one contributor to a record level of mishandled baggage that same month.²¹

Figure 12: Mishandled Baggage – U.S. Major Air Carriers



Source: Aviation Consumer Protection and Enforcement, *Air Travel Consumer Report*
(<http://airconsumer.ost.dot.gov/reports/>)

Another industry change that influences mishandled baggage rates was the introduction of baggage fees for checked luggage. Although some U.S. discount carriers began the practice of charging for checked baggage in 2007, the first legacy carrier in the U.S. to begin this practice

²¹ USA Today, "Mishandled Luggage Hits Record in August", Oct. 5, 2006.

was American Airlines in May of 2008. Although some carriers have resisted the extra revenue stream that this practice provides for (notably Southwest), most airlines have followed suit.²² Charging for checked baggage has resulted in fewer passengers checking in their baggage, preferring instead to stow the luggage on board and avoid the fee.²³ According to SITA, the number of passengers checking bags dropped from 83.0 percent in 2008 to 70.4 percent in 2010. With the number of passengers checking bags declining, a drop in the ratio of mishandled bags to enplaned passengers will falsely indicate improving service to customers.

Detail on the causes that lead to mishandled baggage is provided by SITA in its annual baggage report. According to SITA, over 50 percent of mishandled bags trace their root cause to passengers that have connecting flights where baggage does not make the transfer.²⁴ With tight connecting schedules, arrival delays and increasing security screening requirements often result in baggage not making the connection.

Comparisons to Canadian Data

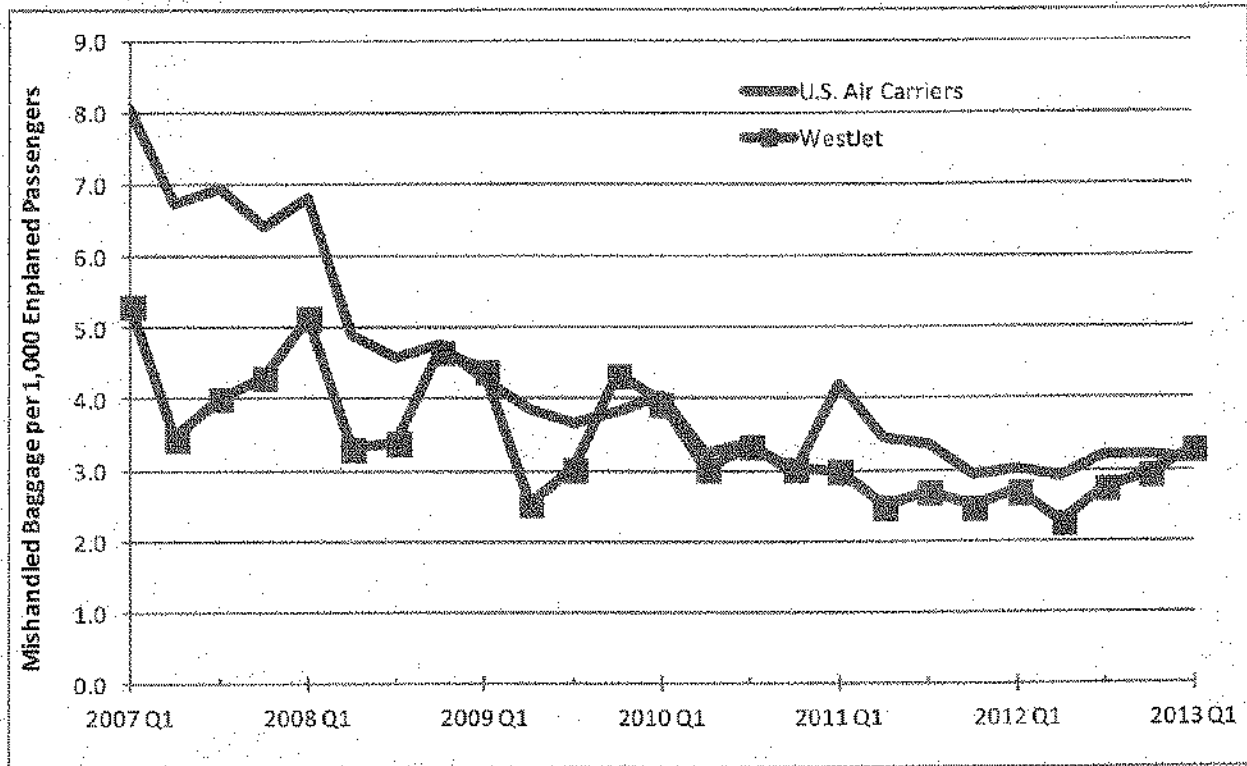
Similar to their other published other customer service data (on-time arrival and completion / cancellation rate), WestJet includes data on its mishandled baggage rate in its reporting to shareholders. Figure 13 contrasts the quarterly WestJet mishandled baggage rate with the rate for U.S. airlines flying domestic routes.

²² Air Canada recently announced on its web-site that it would be charging passengers for checked the first piece of baggage on its routes to the U.S. beginning on October 11, 2011 (more than one bag is already subject to a baggage fee).

²³ Yamanouchi, K., "Baggage Fees Cause Ripple Effect", *Atlanta Business News*, September 5, 2010 (<http://www.ajc.com/business/baggage-fees-cause-ripple-607316.html>).

²⁴ SITA, *Baggage Report 2011* (www.sita.aero/content/baggage-report-2011)

Figure 13: Mishandled Baggage (U.S. Carriers vs. WestJet)



Source: Aviation Consumer Protection and Enforcement, *Air Travel Consumer Report* (<http://airconsumer.osi.dot.gov/reports/>)
WestJet Financial Reports (www.westjet.ca).

The WestJet baggage rate generally follows the U.S. data in declining since 2007 as the economy cooled and entered the Great Recession. Indeed, the more moderate decline in lost baggage rate demonstrated by WestJet appears to mirror the less severe impacts of the recession in Canada. Improving baggage rates in Canada and the United States also reflect improved technology (both screening and baggage handling) as well as a declining numbers of passengers actually checking bags due to the increased prevalence of user fees for checked bags. Unfortunately, a lack of data for analysis purposes preclude the ability of Staff to determine the relative contribution of these factors to the decline.

6.0 Summary

The data presented in the previous chapter suggest a number of important drivers and trends that can be generalized in terms of their impacts on the level-of-service indicators.

6.1 Principal Drivers

As the data in the previous chapter suggest, economic activity is the primary driver of air traffic and plays a major role in determining the rise and fall of many level-of-service indicators. The impact of economic growth on LOS indicators is not direct per se, but manifests itself through exposing existing capacity constraints in the system. While variation in performance can be expected in any complex process, level-of-service issues generally arise when rising levels of air traffic meet constraints or bottlenecks in the system. Of course, exogenous shocks such as extreme weather conditions, pandemics, or other events beyond the control of the airlines such as volcanic ash clouds, also play a role but these are usually of relatively short duration.

Apart from economic growth, a number of other drivers have a role in influencing LOS indicators to varying degrees. Two key drivers that have played a role in the U.S. context are regulation and industry practice:

- **Regulation.** Changes in security regulations since 9/11 have resulted in expanded requirements for baggage and passenger screening, thus increasing the likelihood of delays or mishandled baggage. Extending consumer protection regulations like the introduction of penalties for excessive tarmac delays in the U.S. have led to a dramatic decline in the incidence of tarmac strandings.
- **Industry Practices.** Changes in operating practices in the airline industry can also have an influence on LOS performance. In the U.S., the practice of charging for checked baggage may be falsely lowering the ratio of baggage complaints per enplaned passenger. Conversely, anecdotal evidence suggests that the practice of using regional jets on trunk routes has increased bumped passengers and the incidence of baggage-related complaints.

6.2 Trends

Given these drivers, what trends are observed in LOS indicators? Data from the United States suggest an improvement in many LOS categories over the past 5 years as the economy slowly recovers from the Great Recession of 2008/09. While one would generally expect a modest rise in the frequency of complaints as the economy continues to recover, recent anaemic growth forecasts and the spectre of a "double dip" recession now put this prediction in doubt.

In Canada, the Great Recession was not as severe as it was in the United States and most indicators indicate that the recovery has been more robust to date. As a result, one might predict that any LOS indicators that are strongly linked to economic growth (on-time performance, cancellations and mishandled baggage) have begun to deteriorate. The limited data set that is available for Canada (mainly from WestJet) is inconclusive in this regard. While on-time arrival performance appears to support this supposition, the incidence of mishandled baggage at WestJet continues to improve.

While economic cycles provide the impetus for longer run trends, most LOS performance indicators also exhibit predictable seasonal fluctuations. The busy travel seasons associated with Christmas holidays and summer vacations usually contain sharp deterioration in performance as

high demand bumps up against capacity constraints in the system. Travel demand slackens during the "shoulder" seasons (Fall and Spring) and generally results in improved LOS performance. The effects of heightened seasonal travel demand can be clearly seen in the monthly U.S. LOS indicator data. Canadian data from the airlines, although quarterly, exhibit the same seasonal patterns with spikes observed in the 1st and 4th quarters.

Other trends that influence LOS indicator performance to a lesser degree include regulatory changes (e.g., monetary penalties for excessive tarmac delays in the U.S.), the introduction of new technology (e.g., baggage handling) and changes in industry practice (e.g., using regional jets on trunk routes).

6.3 Data Availability

In Canada, good survey-based data exists on the Canadian airline industry and on both domestic and international air traffic. These data are collected by Statistics Canada and provide insights into the industry itself as well as detail on the aircraft movements and passenger enplanements. While industry data are well established and of relatively good quality, air passenger level-of-service data from official sources are completely lacking.²⁵ What non-official data that is publicly available suffers from one or more of the following deficiencies:

- Operational definitions for the variables are not published or are inconsistent
- Information on data coverage (e.g., the composition of the sample) is lacking
- Data collection and/or quality control processes are not specified
- Published data series lack sufficient observations to provide a time series for statistical analysis purposes

As a result, one must look to other jurisdictions to obtain information on trends and drivers and then consider whether the results are representative of the situation in Canada. Fortunately, the LOS data from the U.S. are quite strong. The question remains as to whether or not the American experience (trends, drivers, etc.) reflected in the BTS statistics is broadly indicative of what is happening in Canada.

6.4 Using U.S. Level-of-Service Indicators

Although there are many similarities between the Canadian and the U.S. air travel sectors, there are important differences as well. Dissimilarities include the great mismatch in population size, population density and a more concentrated air travel industry sector in Canada. Certainly airspace and airport congestion is a bigger issue in the U.S. than in Canada. Congestion at many U.S. hubs is an ongoing concern despite investment in new runways, air traffic management technology and re-designed procedures to take advantage of them.²⁶ In the absence of definitive studies, however, it is difficult to draw any conclusions as to whether or not U.S. data reflects the Canadian experience.

That said, there is certainly anecdotal evidence to suggest broad comparisons are possible. While even the largest of Canadian airports are not close to the big U.S. hubs in terms of passengers or

²⁵ Transport Canada recently updated The Canada Transportation Act data regulations (*Regulations Amending the Carriers and Transportation and Grain Handling Undertakings Information Regulations*, Canada Gazette Vol. 145, No. 8 – February 19, 2011) but these changes do not involve the introduction of any data requirements for air passenger level-of-service indicators).

²⁶ Federal Aviation Administration, *Capacity Needs in the National Airspace System, 2007-2025*

aircraft movements,²⁷ the primary driver of air traffic (aircraft movements and enplaned passengers) is the same the world over: economic activity. Due to the high degree of economic integration between Canada and the U.S., a strong correlation between the business cycles of the two countries exists. As a result, one of the principal long-term drivers of traffic (and hence delays, cancellations, mishandled baggage etc.) will generally have similar impacts on both sides of the border. Also, bigger Canadian airports and certain air traffic zones also suffer from capacity constraints at peak periods and will also experience similar challenges during inclement weather.²⁸

In terms of operational definitions, both Air Canada and WestJet indicate that they follow the U.S. BTS operational definitions. While not explicitly stated, the data both airlines publish (or published in the case of Air Canada) are far more than likely to be for their entire operations and not just the domestic network. This is a key consideration when comparing data from the two countries (or indeed in making comparisons between carriers) in that international flights are specifically excluded from the data for the US carriers published by the BTS. The nature of international flights generally involves longer distances, larger aircraft with more passengers, more baggage per passenger, more congested departure and destination hubs, etc., often resulting in reduced level-of-service performance.

So while the U.S. data may be broadly indicative of general trends in Canada, staff was unable to find any studies to support or refute this hypothesis. The limited Canadian data from WestJet and Air Canada suggest that Canadian and U.S. trends are certainly similar. These data similarities are driven in large part by highly integrated economic cycles and shared weather patterns in areas within 160 kilometers of the border where 75 percent of the Canadian population resides. Nevertheless, data from important Canadian carriers such as Air Transat and Porter airlines are not available making it difficult to develop broader conclusions about the air travel industry in Canada.

6.5 A Level-of-Service Indicator Data Set for Canada

Would a database of LOS indicators similar to the BTS data set be useful for Canada? The answer is certainly yes. Consumers would benefit in that they would have access to information on the performance of carriers. Air carriers with strong performance would trumpet their showing while weak results would almost certainly spur efforts to improve. The data would also be a boon for policy makers and researchers working in the air sector. Last but not least, a LOS data set would be very useful for regulators to provide context for adjudicating complaints.

An ideal solution would have the primary air carriers in Canada provide such LOS data on a voluntary basis. To extend this vision a bit further, all of the information provided by the airlines would be in alignment with a standardized set of operational definitions and collected in the same manner. Finally, the data frequency would be monthly as this would provide the best information on seasonal patterns.

²⁷ According to the Airlines Council International, Toronto's Pearson International Airport (YYZ) handled 31.9 million passengers in 2010 with 419,044 aircraft movements. By way of comparison, the busiest airport in the U.S. (indeed the world) is Atlanta Hartsfield (ATL), which processed 89.3 million passengers with 950,119 aircraft movements.

²⁸ Nav Canada identifies the Toronto-Ottawa-Montreal zone as the busiest air traffic corridor in Canada.

What is unknown is exactly what data the carriers currently collect. While one can speculate on the operational data required to run an airline there is no certainty that all airlines collect exactly the same data, follow the same operational definitions and collect the data in the same way. More importantly, there is also no indication whether or not they would be willing to share such information with the Agency -- even if they had assurances of confidentiality.

A good interim step, however, is to collect whatever LOS data are available from the airlines and augment it with on-time performance data obtained from other sources such as the US DOT, Transport Canada or SITA. This will fill the gap by providing a general snapshot of the air industry as well as identifying emerging trends. Staff recommendations on a plan to collect the necessary data and to present this information to Members are presented in the next chapter.

7.0 Recommended Air Passenger LOS Indicator Plan

7.1 A Briefing Note for Members

Staff believes an annual briefing of Members will keep them abreast of changes in air transportation LOS indicators and principle drivers. The proposed presentation would be accompanied by a briefing note of no more than two pages and would use charts and other visual aids wherever possible.

The presentation would be no more than 20 to 30 minutes in length with time allocated for questions and/or discussion. The proposed briefing note would include three sections: an executive summary, a section on recent economic and air carrier industry developments and a section on the LOS indicators themselves. A more detailed description of the content is provided below.

Summary

The first section of the proposed briefing will contain a short executive summary of the content with all important findings highlighted for members. A "call-out" box with bulleted headlines could also be employed here.

Recent Developments

The second section of the proposed briefing will be a concise summary of recent macroeconomic and other developments that are impacting the air transportation sector. At a minimum the summary will include discussion of the following:

- **Gross Domestic Product.** The analysis will compare quarterly growth (month over month and year over year) of both Canadian and US real GDP. Canadian national accounts data is supplied by Statistics Canada while US data is published by the Bureau of Economic Analysis.
- **Air Ticket Price Levels.** The Air Transportation component of the Consumer Price Index as compared to the all-items CPI as supplied by Statistics Canada.
- **Exogenous Shocks.** Any exogenous shocks – macroeconomic or otherwise – that might have an impact on air travel supply or demand either directly or indirectly (e.g., volcanic eruptions, oil price spikes, currency or financial crises, pandemics, etc.)
- **Other Issues.** Any other issues affecting LOS indicators including air carrier policy, technology, regulation or consumer preferences.

Air Transportation LOS Indicators

The third and final section of the proposed briefing will present the LOS indicators presented previously in this report. The briefing note will contain the latest data for each of the indicators (in graphical form) along with a brief discussion. The main indicators for which Canadian data exists include the following:

- **On-time performance.** The monthly on-time performance of US carriers compared with quarterly data published by Canadian carriers (where possible). Staff recommends that Figure 5 (see page 211) be reproduced in the briefing note.

- **Flight Cancellations.** The monthly flight cancellations reported by US carriers compared with quarterly data published by WestJet (Air Canada does not publish this indicator). Staff recommend that Figure 9 (see page 255) be reproduced in the briefing note.
- **Mishandled haggage.** The baggage rate reported by US carriers compared with quarterly data published by WestJet (Air Canada does not publish this indicator). Staff recommend that Figure 13 (see page 311) be reproduced in the briefing note.

Additional indicators will be included should data be obtained – in some cases this may involve an order of magnitude estimation or the development of a range of possible outcomes.

Feedback/Continuous Improvement

The last but nevertheless a key element of the Members' briefing will involve asking members for their feedback on the briefing along several dimensions:

- Overall Relevancy: Is the briefing note still relevant and useful to Members?
- Content: Should additional LOS indicators be added? Removed? Modified?
- Level of detail: Is there too much detail provided? Not enough?
- Frequency: Should the briefing note be provided less frequently? More frequently?

Staff also propose to monitor potential data sources (e.g., Transport Canada, Statistics Canada, air carriers, etc.) to ensure that Members are receiving the most current information possible. Should additional Canadian LOS indicators be identified, they would be assessed for inclusion in the briefing.

7.2 Data Collection Plan

Data Sources

The data elements required for the briefing and their sources are presented in the following table:

Table 2: Level-of Service Indicator Data Sources

Data Element	Data Frequency	Source	Description
Real GDP (Canada)	Quarterly	Statistics Canada (Cansim Table: 380-0002)	Expenditure-based, chain-weighted, seasonally adjusted at annual rates
Real GDP (United States)	Quarterly	Bureau of Economic Analysis (BEA Interactive Data)	Expenditure-based, chain-weighted, seasonally adjusted at annual rates
CPI - Air Transportation	Monthly	Statistics Canada (Cansim Table: 326-00201)	All-Items CPI Intercity Transportation - Air
On-Time Arrival (Canada)	Quarterly	WestJet www.westjet.com/guest/en/media-investors/financial-reports.shtml	Percentage of flight operations arriving within 15 minutes of scheduled time
On-Time Arrival (United States)	Monthly	US DOT http://airconsumer.osl.dot.gov/reports	Percentage of flight operations arriving within 15 minutes of scheduled time

Data Element	Data Frequency	Source	Description
Flight Cancellations (Canada)	Quarterly	WestJet www.westjet.com/guest/en/media-investors/financial-reports.shtml	Percentage of flight operations cancelled
Flight Cancellations (United States)	Monthly	US DOT http://airconsumer.ost.dot.gov/reports	Percentage of flight operations cancelled
Baggage Rate (Canada)	Quarterly	WestJet www.westjet.com/guest/en/media-investors/financial-reports.shtml	Total baggage reports per 1,000 enplaned passengers (system-wide)
Baggage Rate (United States)	Monthly	US DOT http://airconsumer.ost.dot.gov/reports	Total baggage reports per 1,000 enplaned passengers (domestic only)

Timing

To produce the annual briefing note, data from the US Bureau of Transportation Statistics and from Canadian carriers will need to be collected and stored. Since many of the data are not published until weeks or even months after the end of each quarter, Staff expects quarterly data collection to occur 2 months after the end of every quarter when most data have been published. For the annual briefing, Staff suggests an April-May timeframe as this will allow inclusion of all the data from the previous calendar year.

Level of Effort

Staff will develop and maintain a small database of the air passenger LOS indicators to facilitate analysis and production of the annual briefing. The initial development of the database and mock-up of the prototype briefing note is expected to take up between 4 and 6 person days of effort. Once approved, the ongoing level-of-effort required to gather the data and produce the briefing note, prepare and deliver the presentation is estimated to be around 4-5 person days of effort annually.

Appendix A: Quality and Level-of-Service Theory

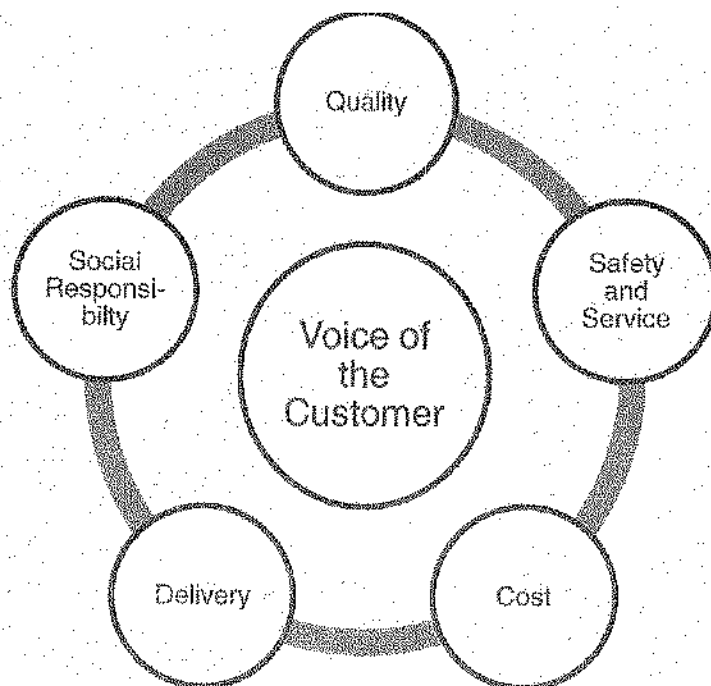
This appendix briefly explores management science theory of quality and level of service to provide context for the selection of level-of-service indicators. In the first section, a key quality and customer satisfaction model is presented along with examples from the airline industry to illustrate the concepts.

Management Science Theory

All corporations attempt to assess and respond to their customers' needs and expectations. The ability to listen to the voice of the customer and respond rapidly can result in a strong competitive advantage. Conversely, corporations that do not consider customer needs will quickly find themselves foundering or insolvent.

The voice of the customer is a cornerstone of the quality movement, particularly emphasized, for example, in Lean Manufacturing and Six Sigma's quality methodology. As shown in Figure A1, customer needs and expectations for either products or services can be divided into five broad categories:

Figure A1: Customer Needs and Expectations



Source: Adapted from Motorola Corporation: "What do Customers Want?" Motorola University, 2007

1. **Quality.** The quality of a product or service refers to specific features, attributes or characteristics such as the number of defects, reliability or availability. It can also include more intangible matters such as comfort, design features, taste and a host of similar qualitative attributes. In the context of airline passengers, quality needs will include such diverse items as in-flight movie selection, seat comfort and food service presentation.

2. **Safety and Service.** This category includes customer needs and requirements associated with both product liability and post sale servicing. Of course, transportation safety is a key concern of passengers, airline companies, aircraft manufacturers and government regulators alike. An example of post sale servicing in the airline industry is how well baggage claims are handled.
3. **Cost.** Includes the initial purchase price as well as all life cycle costs, repair costs, financing terms and the residual value. From a customer perspective, value for money in the cost of an airline ticket includes both relative (relative to other passengers as well as relative to other modes) and absolute (maximum price that the consumer is willing to pay) components. Issues of price transparency are also included in this category.
4. **Delivery.** Needs related to product or service delivery lead times, turnaround times, setup times, delivery times and/or delays. On time departure of aircraft, arrival delays and delays in obtaining baggage are included in this category.
5. **Corporate Social Responsibility.** Corporate Social Responsibility (CSR) is increasingly recognized as an important need by consumers. The company's ethical business conduct, environmental impact, regulatory and legal compliance are all included in this category.

All airline companies have integrated quality management into their operations following different approaches and with varying degrees of success. One U.S. carrier, Southwest Airlines, for example, uses a balanced scorecard approach to achieve customer needs of quality service, low prices and strong on-time arrival performance. By reducing ground turnaround the company increases its profitability, allowing it to provide low fares. At the same time, fast turnaround translates into a higher percentage of on-time arrivals, their customers' second key priority. Canada's WestJet follows a similar approach, tracking performance against three key indicators of their customers' experience in their annual report: on time performance, completion rate and lost bag ratio.²⁹

Kano Analysis

Service quality can also be examined from the context of impact on the consumer to answer the question: "what are the differences types of customer requirements"? This type of analysis clearly shows that consumer expectations and needs are not static. While certain customer needs (e.g., safety) may not change that much, others may shift over time due to a number of factors. A better understanding of how and why these shifts occur is helpful in looking at the importance of level of service indicators.

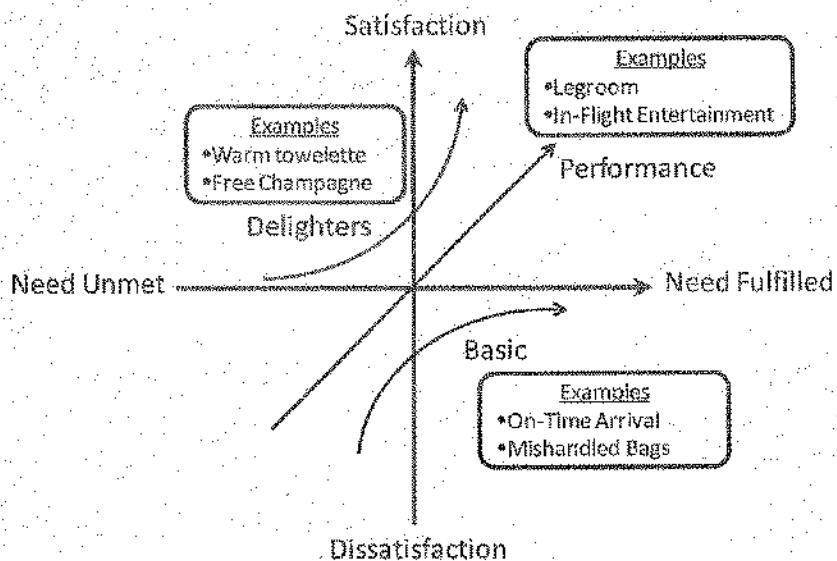
Noriaki Kano and several quality management colleagues developed a customer satisfaction model in the 1980s to explain how consumers react to different features of a good or service. The Kano model (see Figure A2 below) can be used to provide a more complete understanding of the impacts of improving product or service attributes on overall customer satisfaction.

In its most basic form, customers can be broken into three categories: Basic, Performance and Delighters. Basic attributes are those that must be present in a product or service (e.g., toilet paper in hotel rooms) but do not necessarily increase satisfaction if they are present. These attributes, which Kano referred to as "must be" – represent the customers' basic requirement. For

²⁹ Staying True - WestJet Annual Report 2010, pg. 27.

an airline passenger, basic attributes include such things as sufficient space in storage bins, baggage arriving with the passenger, etc.

Figure A2: Kano Model of Customer Satisfaction



Source: Adapted from Kano, Noriaki; Nobuhiko Seraku, Fumio Takahashi and Shinichi Tsuji. "Attractive Quality and Must-Be Quality" (*translated from Japanese*). Journal of the Japanese Society for Quality Control 14 -2 (April 1984); pgs. 39-48.

Kano's performance attributes are features which when improved, result in greater customer satisfaction. Seat size, leg room and on-time arrival performance are examples of performance attributes in the airline industry.

The last category theorized by Kano is termed "delighters". These are attributes of a service that are not expected but when present lead to high levels of satisfaction. Conversely, their absence does not lead to dissatisfaction. Champagne served at check in or hefty frequent flyer program bonuses for using online check-in are examples.

Kano noted that customer requirements change over time. Attributes that were originally "delighters" (e.g., individual in-flight entertainment systems) are now considered "basic" by the travelling public – at least on long-haul flights. The airline industry also provides good examples of the opposite occurring as well. When discount carriers began the practice of eliminating complimentary food service in economy class and legacy carriers followed suit, a former "basic" attribute was transformed back into a "delighter".

Other factors can also lead to more temporary shifts. Travellers with departures that coincide with a large blizzard may temper their expectations about an on-time performance. Indeed, many of these passengers may be thrilled if their plane departs within an hour of the scheduled departure time.

In examining level of service indicators, it is important to note that the bulk of complaints from the travelling public received will come from the basic category. Passengers rightly expect their bags to arrive with them at their destination. While there are expectations concerning performance category items, Kano's model suggests that reactions to these requirements not being met are much less likely to generate complaints and must be surfaced through the use of

surveys or similar feedback mechanisms. Level-of-service indicators, therefore, will be primarily drawn from those aspects of the service that are deemed basic or "must be" by consumers.

Appendix B: Economic Growth and Air Traffic Demand

Forecasters modelling air traffic demand typically assess Revenue Ton Kilometres (RTK) for cargo or Revenue Passenger Kilometres (RPK) for passengers as independent variables in their analysis. Of course the U.S. replaces both with the Imperial-based (statute mile) equivalent. Unconstrained forecasts of these variables following an econometric approach generally include the following three explanatory variables: Gross Domestic Product (GDP) growth, ticket prices and exogenous shocks (e.g., 9/11). Of the three, GDP usually provides the highest coefficient (as indicated by the beta from the regression) and the strongest relationship (as indicated by the probability or P-value).

Figure B1 shows the relationship between the year-over-year growth in quarterly real GDP in the U.S. and the year-over-year quarterly Revenue Passenger Mile for domestic air travel on scheduled airlines. Other than the period immediately following the September 11, 2001 terrorist attacks, the two series have a very strong correlation with one another. Indeed the simple correlation statistic between 2003 Q1 and 2013 Q1 is 0.84 (correlation of 1.0 indicates a perfect fit).

Figure B1: Growth in GDP and Passenger Revenue Miles in the United States

