Supplementary Expert Report of Dr. Michael W. Tretheway
In-flight Catering at Vancouver International Airport

1 August 2018

Prepared for
Goodmans LLP, counsel to Vancouver Airport Authority

Table of Contents

1.0 Introduction

Supplementary Statement

I prepared a statement on 11 January 2018.[1]

- Counsel has asked me to update that statement by a) updating data on catering spending by airlines, both in the U.S. and Canada, and b) updating the number of caterers at Canadian airports, as well as certain information regarding inflight catering at YVR. I do so in this supplementary statement,
- I have preserved my original comments and tables/graphs and supplemented these with additional graphs and tables, which are in the appendices. Where possible I have added new comments as separate updating sections, but without section numbers, so as to preserve my original section numbering.

1.1 My Statement of Identity and Interest

1.1.1 I am Dr. Michael W. Tretheway. I reside in Richmond, British Columbia, Canada.

1.1.2 I am currently Executive Vice President, Chief Economist and Chief Strategy Officer of the Inter*VISTAS* Consulting Group (InterVISTAS). I am Managing Director, Canada of InterVISTAS Consulting Inc. (InterVISTAS).

1.1.3 Inter*VISTAS* Consulting Inc., a Canadian company, is 100% owned by Royal Haskoning DHV based in Amersfoort in the Netherlands. Inter*VISTAS* forms part of the Aviation Business Line within Royal Haskoning DHV, a global provider of consultancy and engineering services in the areas of aviation, transportation, water, environment, building and manufacturing, mining and hydropower.

1.1.4 From 1983-1996, I was a full time faculty member (Assistant, later Associate Professor) in what is now the Sauder School of Business of the University of British Columbia. Since 1997 I have been an Adjunct Professor for most years, except for short periods between appointment renewals. My most recent appointment has lapsed and I have not sought to renew it.

1.1.5 From 1994-1996, I was Executive Advisor to the Honorable Dr. David Emerson, President and Chief Executive Officer of VAA. I later served as Vice President of Marketing Services for VAA.

1.1.6 In 1997, I co-founded YVR-VISTAS, a wholly owned subsidiary of VAA. Soon after its founding, YVR-VISTAS management realised that to be successful the company would have to be independent of any airport, and an offer was made to VAA for an employee purchase of 100% of company. On 1 January 1999 the transaction to become independent was completed.[2]

1.1.7 The InterVISTAS Consulting Group is a result of merging elements of four firms: YVR-VISTAS, Global Aviation Associates, Innova Consulting (both the U.S. and Netherlands Innova companies) and elements of our parent firm, Royal Haskoning DHV.

1.1.8 Since 1999, VAA has remained a client of InterVISTAS. Our single largest annual engagement

[1] This was incorrectly dated as 11 January 2008.

[2] Ownership of YVR VISTAS was transferred on 1 January 1999. The company name changed a few weeks later from YVR VISTAS to InterVISTAS Consulting Inc. on 29 January 1999.

with VAA has been conducting customer service surveys of YVR passengers. However, our business is not dependent on our relationship with VAA. VAA represents less than 4% of InterVISTAS revenues.[3] VAA is not InterVISTAS' largest client; nor is it either InterVISTAS' largest airport client or our largest Canadian client.

1.1.9 I note that in each of 2012 and 2013, InterVISTAS was engaged by Gate Gourmet's Vancouver operation to provide a presentation on global and Canadian developments in the air transport industry. I delivered the presentations together with one of my InterVISTAS colleagues. The presentations largely followed a presentation on industry trends I had used at a number of conferences over that period. InterVISTAS regularly receives such small engagements to provide updates to airports, tourism agencies, business users of aviation services, government departments and industry and academic conferences. To the best of my recollection, the presentations to Gate Gourmet included only one or two slides dealing with in-flight catering developments specifically, on the subject of the declining spend by airlines on catering generally.

1.1.10 I do not have any financial interest in the outcome of this proceeding. My employment compensation is a fixed salary and there is no bonus associated with the outcome of this proceeding. The compensation received by InterVISTAS associated with this proceeding is based on hours worked and on any expenses incurred, and there is no incentive or penalty to InterVISTAS based on the outcome of this proceeding.

1.2 Area of Expertise and Qualifications

1.2.1 My area of expertise in this matter is in air transportation economics, including airline evaluation of routes and networks, airline economics, airport economics and competition economics issues pertaining to airlines and airports.

1.2.2 Appendix A contains a statement of my qualifications. Appendix B provides my Curriculum Vitae. Appendix C contains a list of the range of my expert witness engagements.

1.2.3 In brief, I have a PhD in Economics from the University of Wisconsin (1981). My major field was econometrics, which is the field that uses statistical techniques to obtain empirical information on economic markets. My second field was monetary economics and my third field was international economics. From 1983-1996, I taught in the Transportation and Logistics Division of the Sauder School of Business at the University of British Columbia (UBC), where I taught Air Transport Management and Economics, Managerial Economics, Project Evaluation including Social Cost Benefit Analysis, the Role of Government in Business, and Business Statistics, among other courses.

1.2.4 I have actively published in the field of air transport economics in peer-reviewed journals, primarily in the years prior to forming my consulting practice. I have authored five books, including *Airline Economics*, and two books on Canadian airline costing and productivity. I have published chapters in books dealing with the subject of airport marketing and competition. Recently I have been asked by a publisher to author a new edition of my airline economics book. I was Director of Research for the Ministerial Task Force on International Airline Policy and wrote its report.[4] My contribution to the field of

[3] The 2016 *VAA Annual and Sustainability Report* indicated that InterVISTAS was contracted for $365,000 of services in 2016. I note that the large part of this is the conduct of customer service surveys of passengers in the Main and South Terminal buildings.

[4] The Task Force was chaired by Marshall Rothstein, later Justice of the Supreme Court of Canada.

airline and airport economics was recognized in 2006 when I was selected by the Scientific Advisory Board of the European Aviation Conference as the third Martin Kunz Memorial Lecturer.[5]

1.2.5 My airport economics research began with a series of studies beginning in 1985 on airport pricing, commissioned by the then economics directorate of Transport Canada, and on airport governance and regulation models for Transport Canada's Airports Transfer Task Force. From 1989-1991 I was a member of the Minister's Airports Transfer Task Force,[6] which assisted the Minister in developing guiding principles for the privatization of airports, and evaluating the first four airport transfer proposals.

1.2.6 I have been a consultant to or done research on perhaps 100 airports around the world, or for investors in private airports or for bond rating agencies. These airports include almost all of the major airports in Canada, US airports such as Minneapolis, Denver, the Port Authority of New York and New Jersey (LaGuardia, JKF and Newark), Houston Airport System, and airports overseas such as Sydney Australia, and Singapore. My work with airports particularly in Canada is often directly with the boards of directors and executive management of many of our airport clients, large and small. For example, I have facilitated airport authority biannual strategic planning reviews for many airports in Canada.

1.2.7 I have been engaged by governments to provide research and advisory services on airport issues. This includes Transport Canada, Canada's Commissioner of Competition (Commissioner), the Government of Alberta, and others. I have consulted on airport issues in North and South America, Asia, Europe, Australia and New Zealand. In 2016 I undertook a major project to assist the newly formed Malaysian Aviation Commission to set up price regulation of its airports. I have been engage by the International Transportation Forum of the Organization for Economic Cooperation and Development on airport issues, including issues of airport slots and regulation generally, and specifically in Mexico. In Canada I was an expert witness retained by the Toronto Port Authority (TPA) in a court case involving slot allocation by the TPA for the Toronto Island Airports, a case where the Competition Commissioner gave a letter of comfort to the TPA for a policy that allowed it to restrict the number of carriers at the airport so as to enhance competition in industry.[7] In 2016 I was an expert witness in a court case involving trespass onto airport premises, with my role being to describe and contrast the current and previous airport governance models.

1.2.8 I have been engaged as a consultant for the Commissioner in its investigations of:

- Airline mergers
  (regarding the merger of Canadian Airlines International into Air Canada, the merger of PWA and CP Air to form Canadian, the merger of Wardair into Canadian, the acquisition of Air Ontario by Air Canada, Air BC into Air Canada);
- Airline alliances and joint ventures
  (regarding the joint venture of Air Canada and United-Continental Airlines)
- Predatory pricing
  (the case involving Air Canada's alleged conduct vis a vis WestJet and Royal)

[5] I note that two of my former students have recently been also recognized, Martin Dresner of the University of Maryland (2015) and Anming Zhang of the University of British Columbia and Hong Kong University (2016).

[6] This Task Force was chaired by Deputy Minister Glen Shortliffe who later became Clerk of the Privy Council.

[7] This was an example of the Competition Commissioner itself endorsing the seemingly paradoxical practice of restricting one aspect of competition in order to enhance overall industry competition. In this proceeding my engagement was with the TPA not the Commission.

- Other abuse of dominance
  (regarding the creation of Air Canada Tango)
- Airline computer reservation systems
  (regarding the creation of the Gemini Computer Reservation System and the subsequent dissolution of that entity).

1.2.9 I have also been engaged by the competition authority of New Zealand, the New Zealand Commerce Commission, on a matter of alleged airline price fixing for cargo services.

1.2.10 In the area of airline route and network decisions, at InterVISTAS I have been responsible for our air service development practice in Canada in most years and for our global practice in some years. Air service development is an industry term to describe marketing of airports and routes to airlines. In addition to my role supervising our air service staff and services, I also evaluate our core software tools. InterVISTAS has subscribed to a number of airline network and route software products such as Sabre Airlines Solutions' Planet route evaluation software and Lufthansa Systems LiftPlan network evaluation and optimization tool. Our tools are used to provide existing or potential airlines with route and network evaluation. Our tools are also used for other purposes. E.g., recently we have undertaken route feasibility studies and subsequent traffic forecasting for use in a social cost benefit analysis of a runway extension at Wellington New Zealand. This work is being used in a proceeding before New Zealand's environment court.

1.2.11 I have testified in roughly 75 court or tribunal proceedings, regulatory hearings and arbitrations, and have done so in Canada (including two before the Competition Tribunal specifically, the U.S., New Zealand, Australia, Hong Kong, South Africa, and before the European Commission. (See list in Appendix C.) In all these proceedings my qualifications have been accepted.

1.3 Questions to be Addressed

1.3.1 Counsel for the Vancouver Airport Authority (VAA) has asked me to address the following questions relating to in-flight catering services at the Vancouver International Airport (YVR):

1.3.2 Question 1: What have been the key developments in the evolution of airline demand for in-flight catering services in North America in general and Canada in particular since 1992?[8] What are the supply conditions affecting, and the structure of, the in-flight catering industry?

1.3.3 Question 2: What is the significance of in-flight catering services to airlines?

1.3.4 Question 3: What are the incentives of airport authorities, and in particular VAA, both generally and with respect to the provision of access to in-flight catering operators specifically?

1.3.5 Question 4: What is your opinion of the rationale offered by VAA management for declining to issue licences to new entrant in-flight caterers at YVR in 2014 having regard to your answers to questions 1 through 3?

1.3.6 With regard to the rationale offered by VAA management for its 2014 decision, I am advised as follows:

[8] 1992 was the year in which the Vancouver Airport Authority began operating the airport.

"In 2014, VAA management had concerns that there was not sufficient demand for in-flight catering at the airport to support a third caterer and that the entry of a third caterer could put at risk the viability of one (or perhaps both) of the two incumbent in-flight caterers at the airport.

At the time, there were two in-flight catering firms, Gate Gourmet and CLS, which had both been operating at the airport for a long time. Both offered full-service catering, including freshly prepared meals (primarily for first class passengers and long-haul flights) and non-perishable food and drink products (primarily for short-haul flights). In addition, both caterers operated full kitchens on Sea Island.

Management believed that the state of the in-flight catering market at YVR was precarious. The demand for in-flight catering had declined significantly over the preceding decade with many airlines eliminating fresh meal service for most passengers, and replacing them with "buy-on-board" offerings. That contributed to decline in revenues for in-flight catering services, even when passenger volumes increased. VAA management understood that in-flight caterers at YVR were increasingly relying on revenues from sales to customers that were off-site, such as Starbucks, which suggested that those caterers may be struggling to maintain their revenues from on-site customers at YVR (primarily airlines) due to decreased demand. In addition, VAA management understood that unionized employees at Gate Gourmet had recently agreed to a three-year wage freeze.

The history of in-flight catering at YVR offered further reason to believe that there was not sufficient demand to support a third caterer at the airport. Specifically, up until 2003, three in-flight caterers had operated at the airport: Cara Airline Solutions (now Gate Gourmet), CLS and LSG Sky Chefs. Sky Chefs primarily supplied Canadian Airlines, which was then Canada's second-largest carrier. When Canadian Airlines was acquired by Air Canada in 2003, Sky Chefs' business was redirected to Air Canada's preferred caterer at the time, CLS. As a result of a downturn in its business that followed, Sky Chefs decided to leave YVR. VAA management did not believe that the market for in-flight catering at the airport had improved since 2003.

Accordingly, in 2014, VAA management believed, based on the information available to it, that the entry of a third caterer would entail significant risk that one or both of the incumbent caterers would leave YVR.

The consequences of an incumbent caterer leaving YVR would have been highly problematic and not in the best interests of the Airport. Among other things, it would have caused significant disruption in the availability of full-service catering for airlines. As a result, it would have made it more difficult for VAA to attract and retain airlines and routes to YVR.

In addition, VAA management was concerned that the departure of an incumbent caterer would jeopardize the existing competitive market for full-service in-flight catering at YVR. Specifically, if one of the full-service incumbents were displaced by a caterer that, for example, offered only non-perishable products, then that would leave only one supplier of fresh meals in the market. The result would be less competition and fewer choices for airlines."

1.4 Use of Research Assistants

1.4.1 In collecting some background documents I have used in my statement, I have utilised research staff of my consulting firm, Inter*VISTAS* Consulting Inc. For all such assistance, the individuals involved report to or through me, and for these tasks were directly supervised by me. In all cases, I am familiar

with the data sources and computational methods. I have reviewed all information provided and all research undertaken. The opinions expressed in this report are mine and mine alone.

2.0 Summary of My Opinion

2.1.1 I now address the questions put to me by counsel.

2.1.2 Question 1:

What have been the key developments in the evolution of airline demand for catering services in North America in general and Canada in particular since 1992?[9] What are the supply conditions affecting, and the structure of, the in-flight catering industry?

2.1.3 Opinion:

- As documented by data available from the U.S. Department of Transportation, since 1990, there has been a decline in total catering spending in inflation adjusted terms in spite of a strong increase in total passenger traffic; and a dramatic 65% decline in airline real (inflation adjusted) spending on catering per passenger. Similar data specific to catering spending is not publicly available in Canada, but broad trends in airline expenses and customer service are similar in the two countries and it is my opinion that the same broad trend is present in Canada. Data from Air Canada and WestJet annual reports (which combine catering spending with other some expenses) confirm that catering is a very small share of airline expenses.

  Updated: The decline in U.S. inflation adjusted catering per passenger since 1990 is now 62%, only slightly lower than my previous finding.

- Airlines have dramatically reduced their need for catering for continental flights, with economy cabin flights typically focusing on a few standardized, typically non-fresh catering items that are generally but not exclusively prepackaged and standardized. These types of catering items are typically not airline speciality products but rather general national brands (e.g., Coke, Diamond brand almonds). Nevertheless for these simpler catering needs the airlines still have a need for reliability in aircraft servicing and strict adherence to international waste disposal for agriculture and disease protection. Because continental flights, with greatly reduced need for catering services, account for the largest portion of air traffic (roughly 75% of total passenger at YVR), the overall demand for catering services has been reduced substantially.

- On the other hand, the emergence since 1992 (the year when VAA began operating YVR) of aircraft capable of operating nonstop flights of up to 17 hours' duration has led to new pressures on full service fresh caterers to supply 2-3 fresh meals per passenger for each such flight. Further, for long haul intercontinental flights airlines seek specialized catering associated with their own airline brand, a need for consistency in the catering product, an intense need for reliability in aircraft servicing including last minute flexibility in terms of numbers of meals of different types to be loaded, and strict adherence to international waste disposal regulations for agriculture and disease protection. Further, where possible, airlines would like to contract with fewer global catering firms who can accommodate them at multiple airports.

- In-flight catering services to airlines have been fragmented into fresh catering and commissary catering service segments. Until recently, WestJet self-catered commissary catering services at YVR. Fresh catering is not demanded by all continental (i.e., domestic and cross-border) air carriers, but is still a small but important service needed by full service carriers such as Air Canada mainline (distinguished from Rouge and Air Canada Express), United Airlines, Cathay

[9] 1992 was the year in which the Vancouver Airport Authority began operating the airport.

Pacific, British Airways, Aeromexico and many others.

- Carriers such as WestJet, which currently require only commissary catering services, are evolving and some of these, including WestJet, will need fresh catering services in the near future when it launches a program of long haul intercontinental flights. Even though its corporate strategy is to charge for meals on flights, for long haul flights it currently needs and sells fresh catering products.
- Airlines also have the option for continental flights of double catering at the originating station for a return flight from YVR. Alaska and Horizon Airlines, for example, use double catering for their flights from YVR.
- In general the number of catering firms at any given airport is small. In a 2015 survey that InterVISTAS conducted of 63 North American airports, only one airport (Chicago O'Hare Airport) had four on-site caterers, and only ten had three caterers.[10] Of airports with departing passenger volumes the same or lower than YVR, only three had three caterers, and one of these (Edmonton) now only has two caterers. All other airports of YVR's size or smaller (measured by departing passengers) had two or fewer caterers. If the comparison is made using only long haul international passenger volumes (i.e., excluding continental international passenger between Canada and the U.S.), only three airports with fewer such passengers than YVR had more than two caterers (Seattle, Orlando and Dallas), and each of these airports are more than twice the size of YVR in total passenger numbers. No airport in the survey with intercontinental passenger volumes the same or lower than YVR had more than two caterers (other than the temporary experience at Edmonton).

  Update: Since my original statement, two Canadian airports, Calgary and Montreal, have joined Chicago O'Hare airport in having 4 caterers. (Toronto had joined Chicago O'Hare prior to my January 11 statement.) Montreal has fewer total passengers than YVR but a greater number of long haul international passengers. Calgary's traffic in both dimensions is lower than that of YVR, and thus there is now one airport which is smaller than YVR in total passengers and with intercontinental passenger volumes less than YVR that has more than two caterers. The last sentence in the previous paragraph was meant to read "No airport in the survey *smaller than YVR in terms of total passengers and* with intercontinental passenger volumes the same or less than YVR had more than two caterers (other than the temporary experience at Edmonton).Updated: "That sentence should now read: *"Only one airport in the survey smaller than YVR in terms of total passengers and with intercontinental passenger volumes the same or less than YVR (Calgary) had more than two caterers (other than the temporary experience at Edmonton).*"

- Significant consolidation has occurred in the in-flight catering business via mergers of catering firms within and especially across countries. Examining a selection of 27 catering groups operating in 1996, I observe that these have already been consolidated to only eleven. This consolidation is a consequence of a number of factors, including the total decline in catering spend by airlines.

[10] The survey of airports was conducted in 2015 but used traffic data for 2014, which was the most recent data available at the time.

- In sum, the key trends I observe are declining catering spending by airlines (in total and per passenger), a much reduced number of firms in the airline catering business, a simplified catering need for continental markets, a greater need for specialised multiple meal fresh catering for the increasing number of long haul intercontinental flights, and a continuing need for catering speciality by carrier, product consistency, service reliability and adherence to international waste disposal regulations.

2.1.4 Question 2:
What is the significance of in-flight catering to airlines?

2.1.5 Opinion: In-flight catering has the following significance to airlines, which varies by airline flight sector.

2.1.6 Availability of high reliability, high quality, regulatory compliant in-flight fresh catering at an origin airport is of very high importance for long haul intercontinental flights where the elapse of time requires two or more meals to be served. Vancouver's location in relation to Europe, Asia and the Pacific (e.g., Australia, New Zealand, Fiji) is such that almost all such flights will require two meals to be served.

2.1.7 "Double catering" from the previous flight station is possible for long haul flights, but strongly not preferred by airlines due to expense, freshness of product, and limited galley space on board the aircraft.

2.1.8 Availability of high reliability, high quality, regulatory compliant in-flight fresh catering at an origin airport is of importance for continental flights for those airlines offering business/first class cabin service. For these flights, some airlines are willing to double cater from the previous flight station, but the general preference is for origin station catering.

2.1.9 Availability of high reliability, regulatory compliant "commissary catering" (i.e., not involving fresh meals) for continental flights that do not have a premium class service is preferred, but not essential. Double catering and self-catering of commissary items are often used by these carriers in their operations.

2.1.10 For all flights being catered at the airport, catering service reliability is critical, as delays in servicing of aircraft increase airline operation and customer service costs dramatically and exponentially. Research undertaken by InterVISTAS indicates that the delay of a single flight can easily cost an airline tens of thousands of dollars for additional customer service and flight (pilots & flight attendants) labour, fuel, maintenance, and the costs associated with mis-connected passengers. It is the latter category that can exponentially increase in cost.

2.1.11 Catering operations are also significant in terms of agricultural regulatory requirements, especially for proper international food waste disposal. There are also critical health/food preparation regulations and security regulations for employees who service aircraft.

2.1.12 While catering costs are of concern to airlines, relative to other airline costs, catering is one of the smallest operating cost items for airlines. In 2016, Air Canada's Annual Report indicates that food, beverage and supplies of $349 million amounted to only 2.4% of the $14.8 million in revenue, or 2.5% when assessed against total costs. This cost category includes items other than catering and thus overstates actual catering costs. For WestJet, the amount expended on food, beverage and supplies was so low it was not even itemized separately in its 2016 Annual Report, where it was merely included in "other expenses", a catch-all category that represents 7% of revenues. In the U.S. where regulatory filings specifically capture catering spending, catering represents only 1.4% of total costs. Of far greater significance to airlines are labour costs, fuel costs, aircraft leasing and ownership costs, maintenance costs, etc.

Updated: 2017 data from Air Canada shows no change from 2.4% of catering and supplies expense. For WestJet, the "other" category of expenses has increased slightly from 7.1% to 7.2%. For both carriers it continues to be the cases that these income statement accounts include expenses other than catering.

2.1.13 For continental flights, catering costs are a minor item, with airlines typically converting former catering cost to a modest revenue center (on board sales of catering items).

2.1.14 However, fresh catering to the small numbers of business class/first class passengers of continental services is of high importance to airlines. This is because catering is an important component of retaining the loyalty of these passengers in a highly competitive airline market. InterVISTAS survey-based research at YVR and other airports reveals that the overwhelming majority of first/business class passengers are high frequency users of air transport. Retaining these repeat passengers is critical to maintaining the high annual spending of such passengers (high frequency and high fare tickets). There are some passengers flying in the business/first class cabin who may have purchased an economy ticket and/or are using a frequent flyer reward or upgrade. But these passengers are also critical to the airline's success as they only gain the ability to fly in the business/first class cabin by being high frequency fliers. The airlines understand the importance of a quality fresh catering service to obtain and retain the loyalty of these premium cabin passengers.

2.1.15 For intercontinental flights, catering costs are more important but still small relative to other cost categories. What is critical for catering significance to airlines for these flights is customer service and brand reputation. The catering experience of passengers on these flights is important to their perception of the airline brand and their consequent loyalty to the airline. This is especially important to passengers in the first class, business class and premium economy cabins, and is important to frequent flyers in regular economy class.

2.1.16 I also note that there are a modest percentage of airline passengers on long haul flights with special dietary needs or preferences. To address the needs of these passengers and retain their loyalty, airlines typically offer a wide range of menu options (which they hope will be ordered by passengers in advance of the flight). Failure to provide one of these passengers with their requested meal can cause significant stress for both the passenger and the airline's in-flight and ground staff. On a long haul flight with two to three meals, not having the required meal to meet allergy or religious requirements can not only be upsetting it may result in illness or panic. Failure to properly prepare a dietary restricted meal can result in health emergencies on board the aircraft.

2.1.17 Finally, I observe that airlines have a preference for using catering firms who can service them at multiple stations/airports. This simplifies their contract administration, is more likely to provide the consistency of customized product and service the airlines strives to achieve and may result in better prices.

2.1.18 In sum, catering is of relatively low significance to airlines in terms of costs, but of high significance in terms of customer service and loyalty, flight dispatch reliability and conformance to agricultural regulations.

2.1.19 Question 3:

What are the incentives of airport authorities, in particular VAA, both generally and with respect to in-flight catering services specifically?

2.1.20 Opinion: Airport authorities in Canada have their primary interest in supporting the economic development of their communities. This is specified in the objects specified in their letters patent or other constating documents and this is specifically the case for VAA. This is achieved primarily by maximizing the air service connectivity of their communities to the nation and the world.

2.1.21 Maximizing profits is of little or no importance to airport authorities in Canada. They are not-for-profit organizations. Any revenues over expenses earned must be reinvested in airport infrastructure or services. At the end of their corporate lives, any un-invested profits are returned to the crown. Not-for-profit airport authorities, and VAA in particular, are instead maximizers of air service connectivity to drive economic and social connectivity of their communities and regions.

2.1.22 This is an important point for making assessments of the economic behaviour of airport authorities, in my opinion. Much of the theory of competition economics (and the empirical research on the economic behaviour of firms) is grounded in the neo-classical model of firm behaviour which assumes at its core that firms are profit maximizers. If firms are not profit maximizers, as is the case for not-for-profit firms like VAA, many of the central tenets of neoclassical economics may no longer apply. Yet many aspects of competition economics and jurisprudence are based on those neoclassical tenets. E.g., the profit maximizing behaviour of monopolists, which can have detrimental consequences for economic welfare, may not be applicable to not-for-profit firms with objectives such as those stipulated for Canadian airport authorities. If airport authorities are not profit maximizers, then the purported detrimental purpose or effects of their behaviour might not exist.

2.1.23 To achieve the primary object of facilitating the economic development of their communities, airport authorities primarily focus on the development of connectivity of their communities to their region, the nation and the world. This is apparent from an investigation of the annual reports and letters patent of Canadian airport authorities. In forming my opinion on this matter I note that I have directly worked with perhaps 100 airports, of which over half are not-for-profit organizations (or governments). My observation is that all not-for-profit airport operators in general, and those in Canada in particular, have their keen corporate focus on development of connectivity for their communities by expanding the array of air services provided by airlines. Attracting airlines to provide routes and capacity is job number one for airport companies. To be successful at this, airports must provide a range of services to the airlines. This range will include runways which can accommodate an airline's specific aircraft types, terminals with sufficient capacity and range of services, the availability and a choice of ground handling services, the availability and a choice of airline catering services, the availability of a number of freight forwarders who can market and serve air cargo customers, etc.

2.1.24 While the primary general interest of airport authorities is on improving regional social and economic connectivity with the largest possible range and capacity of routes and flights, their specific interest with respect to catering is as a service required by airlines, especially those operating long haul intercontinental flights. This is of particular importance at major hub and intercontinental gateways such as YVR where long haul flights requiring fresh catering for multiple meals are operated. Airlines need catering that meets their needs for high dispatch reliability, consistency in food quality and adherence to regulations. Airlines prefer to have a choice of caterers, just as they do for ground service providers, fuelling, etc. Catering operations that are subject to inconsistency and disruption are an obstacle to achieving the airport authorities' primary objective of the highest possible connectivity for their regions.

2.1.25 The availability of high reliability, high quality, regulatory compliant fresh catering at an airport that has long haul intercontinental flights is essential. It is especially important for an airport where intercontinental distances are such that airlines will serve two or more meals. For such flights, airlines attach very high importance on caterer ability to provide a) fresh meals, and b) a customized range of

fresh meals to allow the airline to serve its customers with special need diets or religious requirements and an airline branded meal experience.

2.1.26 The failure or other sudden exit of a caterer from YVR would be extremely disruptive, whether the change is from two to one caterer or from three to two. The immediate disruption would affect airlines quite dramatically as well as the airport. The airlines would face very large costs of immediately getting fresh catering onto their flights. Double catering as an interim solution could be utilized for some flights, but this is not a desirable solution for intercontinental flights because space on board aircraft would be insufficient. In flight operations could be very disrupted, especially if the replacement catering is unable to accommodate the special meal requests for religious or dietary reasons. Passengers who learn that their special meal needs (Air Canada, for example, offers 18 special meal types and Cathay Pacific offers 21)[11] will not be met can become agitated and in some cases become disruptive or possibly suffer health emergencies. For airports, those flights that are delayed because of catering disruption, will also delay other flights that are unable to obtain a gate upon arrival at the airport.

2.1.27 The commercial aviation industry has also experienced substantial disruption in general and at YVR in particular. This includes the financial struggles of VAA's original major carrier (Canadian Airlines), the merger of Canadian into Air Canada, the profound and lasting impact of 9/11,the bankruptcy of Air Canada, AC's dehubbing of their operation at YVR, and the financial crisis of 2008/2009 and accompanying recession.

2.1.28 Airport marketing to long haul airlines typically discusses not only the airport's own fees and charges, but the range of other services that the airline will require. This will include factors such as fuel (where price is of critical concern to airlines), catering (where availability of fresh catering and its reliability/scope of product are of primary concern), ground handling (reliability and price) and marketing (by the airport and by the local destination marketing organization). I base these observations on my experience in airport route marketing for a range of airports in Canada and abroad, large and small. I also note that airlines prefer service from caterers that operate from a number of stations they serve as there are advantages in terms of consistency of service and price from such firms.

2.1.29 In my airport marketing experience, the issue of catering is rarely raised for continental flights and almost never for regional services and services by low cost and other carriers offering only economy class flights. Double catering is common for such flights.

2.1.30 Thus, from the marketing viewpoint of an airport serving a range of long haul intercontinental markets, in order to achieve the highest possible level of social and economic connectivity for their communities, the catering focus of the airport will be on a) the availability of high quality, reliable fresh catering, b) a competitive choice of catering where the market can support it, with two viable and stable fresh catering firms being the baseline target, and c) where possible fresh caterers will be global service providers or at least providers serving carriers at a number of stations.

2.1.31 For VAA itself, it is of primary importance in meeting the objectives specified in its articles of continuance (originally, its letters patent) that it has a low risk of service disruption and ensure that there

[11] Cathay's meal options include items for special health needs, religious preferences and age: Vegetarian Meal, Baby Meal, Bland Meal, Child Meal, Diabetic Meal, Fruit Platter Meal, Gluten Intolerant Meal, Hindu Meal, Kosher Meal, Low Calorie Meal, Low Fat / Low Cholesterol Meal, Low Salt Meal, Moslem Meal, Low Lactose Meal, Vegetarian Raw Meal, Non-Beef Meal, Liquid Diet Meal, Vegetarian Vegan Meal, Vegetarian Jain Meal / Strict Indian Vegetarian, Vegetarian Lacto-Ovo Meal, Vegetarian Oriental Meal.

Sources: https://www.cathaypacific.com/cx/en_CA/travel-information/flying-with-us/inflight-dining/special-meals.html, https://www.aircanada.com/ca/en/aco/home/plan/special-assistance/special-meals.html.

is a fresh catering service choice for all existing and potential airlines (including the choice of self-catering), with a choice in both price and service dimensions. The VAA objective is not to earn or maximize profits, as that would be inconsistent with its not-for-profit status. Instead, its objectives are to operate the airport in a safe and efficient manner and to develop and operate YVR to enhance regional economic development through the highest possible level of social and economic air service connectivity.

2.1.32 The availability of reliable fresh catering is an important marketing element for attracting long haul carriers, which is how VAA seeks to increase social and economic air service connectivity, including through competition with other airports.

2.1.33 In comparison to the incentives outlined above, I would expect that the earning of rent and licence fee income from caterers would be at best of secondary or tertiary importance to airport companies, among other reasons, as the revenue potential is minor relative to not only the overall revenues of an airport, but also to its investment needs.

2.1.34 Overall, revenues from catering land rents and concession fees account for approximately [redacted] of VAA's revenues. Exercising maximum monopoly power would have, at best, a minor impact on VAA's revenues. Thus catering revenues are only of minor importance to airport authorities in general and to VAA in particular.

2.1.35 It is my opinion, based on observations at a number of airports for provision of a range of ground services, that airports would be willing to forego any revenues from providing airport access to catering firms, if doing so were necessary to provide airlines with fresh catering and a choice of at least two caterers, thereby assisting in fulfilling their mandate to enhance regional economic development through the highest possible level of social and economic air service connectivity.

2.1.36 Question 4:

What is your opinion of the rationale offered by VAA management for declining to issue licences to new entrant in-flight caterers at YVR in 2014 having regard to your answers to questions 1 through 3?

2.1.37 Opinion:

It is my opinion that the rationale offered by VAA management for its 2014 decision appears reasonable having regard to the history of in-flight catering services at YVR and the economics of downstream catering and further downstream airline services, and is consistent with my answers to questions 1 through 3.

2.1.38 *Survivability of flight caterers*

I am advised that one aspect raised by VAA management in 2014 concerned the survivability of caterers, given the YVR experience of losing one of three caterers.

2.1.39 In Section 3.3 I observe that since 1990, there has been a decline in total catering spending in inflation adjusted terms in spite of a strong increase in total passenger traffic; and a dramatic 65% decline in airline real (inflation adjusted) spending on catering per passenger, as documented by data available from the U.S. Department of Transportation. Similar data specific to catering spending is not publicly available in Canada, but broad trends in airline expenses and customer service is similar in the two countries and it is my opinion that the same broad trend is present in Canada. Data from Air Canada and WestJet annual reports (which combine catering spending with other some expenses) confirms that catering is a very small share of airline expenses.

2.1.40 Airlines have dramatically reduced their need for catering for continental flights, with economy cabin flights typically focusing on a few standardized, typically non-fresh catering items that are generally

but not exclusively prepackaged and standardized. These types of catering items are typically not airline speciality products but rather general national brands (e.g., Coke, Diamond brand almonds). Nevertheless for these simpler catering needs the airlines still have a need for reliability in aircraft servicing and strict adherence to international waste disposal for agriculture and disease protection. Because continental flights, with greatly reduced need for catering services, account for the largest portion of air traffic (roughly 75% of total passenger at YVR), the overall demand for catering services has been reduced substantially.

- In Section 4.4 I observe that in general the number of catering firms at any given airport is small. In a survey of 63 North American airports in 2015, only one airport (Chicago O'Hare Airport) had four on-site caterers, and only ten had three caterers. Of airports with departing passenger volumes the same or less than YVR, only three had three caterers, and one of these (Edmonton) now only has two caterers. All other airports of YVR size or smaller at that time (measured by departing passengers) had two or fewer caterers (with the exception of Edmonton, which in 2014 had three caterers and now only has two). If the comparison is made vis a vis only long haul international passenger volumes (i.e., excluding continental international passenger between Canada and the U.S.), only three airports smaller than YVR (in terms of long haul international passengers) had more than two caterers (Seattle, Orlando and Dallas), and each of these airports are more than twice the total size of YVR. No airport in the survey with intercontinental passenger volumes the same or less than YVR had more than two caterers (other than the temporary experience at Edmonton).

  Updated: Calgary currently has 4 catering firms, which is an exception to my statements above regarding airports with passenger volumes the same or lower than YVR and fewer long haul international passenger volumes than YVR. Montreal, an airport that serves more non-transborder international passengers than YVR, also now has 4 catering firms.

2.1.41 I note that the number of caterers at YVR fell from three to two. I also note that the number of caterers at Edmonton Airport there has also fallen three to two.

2.1.42 The 2013 gross revenues of catering firms at YVR had still not recovered to the former 2004 peak.

2.1.43 While not documented at the time, VAA could not have failed to observe that few airports of its size supported more than two catering operations.

2.1.44 VAA also appears to have observed the competition between the two catering firms that resulted in a transfer of business between fresh caterers and a consequent wage freeze agreed to by the employees of one of the caterers to support the ability of their employer to win sufficient business to remain viable.

2.1.45 Thus my opinion is that VAA's concern as to whether there was sufficient demand for in-flight catering at YVR to support entry of a third carrier and/or that such entry could put at risk the financial viability of the two incumbent carriers appears reasonable.

2.1.46 *Precarious nature of in-flight catering business*
I am advised that VAA management believed that the state of the in-flight catering market at YVR was precarious. The demand for in-flight catering had declined significantly over the preceding decade with many airlines eliminating fresh meal service for most passengers, and replacing them with "buy-on-board" offerings. That contributed to decline in revenues for in-flight catering services, even when passenger

volumes increased. VAA management understood that in-flight caterers at YVR were increasingly relying on revenues from sales to customers that were off-site, such as Starbucks, which suggested that those caterers may be struggling to maintain their revenues from on-site customers at YVR (primarily airlines) due to decreased demand. In addition, VAA management understood that unionized employees at Gate Gourmet had recently agreed to a three-year wage freeze.

2.1.47 Again, in Section 3.3 I document the declining demand for catering services. The decline in demand was found, whether measuring inflation adjusted total airline expenditures on catering, catering expenditure per passenger or catering as a percent of total airline cost.

2.1.48 In Section 4.5 I observe that there is an industry-wide basis for this concern in addition to YVR's past experience. There I noted the volatility of returns in the catering sector of the commercial aviation industry. In a previously cited study, IATA has documented the volatility of returns on invested capital (ROIC) earned by caterers. The volatility of ROIC for the catering sector is about a third higher than for the airlines and more than double that of all other commercial aviation sectors. Seven of 11 sectors have average returns exceeding that in catering.

2.1.49 Thus, my opinion is that the perception by VAA management that the catering market was in a precarious state and becoming reliant on off airport customers due to decreases in demand for in-flight catering appears reasonable.

2.1.50 *Potential risk of significant disruption.*
I am advised that in 2014, VAA management believed, based on the information available to it, that the entry of a third caterer would entail significant risk that one or both of the incumbent caterers would leave YVR, and that the consequences of an incumbent caterer leaving YVR would have been highly problematic and not in the best interests of the Airport. Among other things, it would have caused significant disruption in the availability of full-service catering for airlines. As a result, it would have made it more difficult for VAA to attract and retain airlines and routes to YVR.

2.1.51 In Section 5.3 I discuss the objects of VAA and observe that it is not a profit maximizing entity. Instead, its object is to support the economic development of the greater community. In Section 5.4 I observe that it is air service connectivity that fulfills VAA's economic development mandate. In Section 5.6 I discuss how VAA competes with other airports and the role of the availability of consistently reliable catering services in airport marketing. YVR competes with many other airports, especially hub airports for intercontinental traffic.

2.1.52 VAA appears to have understood the importance of reliable and last minute responsive catering services, and the extra importance of this at an airport located on an island separate from other available lands, and where one of the critical bridges is subject to closure by marine traffic, with the closures beyond the control of the airport authority.

2.1.53 In Section 3.7 I discuss the consequence for airline services from disruption in the supply of fresh catering services at an airport. There would be significant impacts in terms of a) operational ability of carriers to serve meals, particularly on long haul intercontinental flights, b) their costs of catering and c) customer service impacts.

2.1.54 It is thus my opinion that VAA's concern with the risk and effects of disruption of catering services appears reasonable.

2.1.55 *Departure of incumbent.*
I am advised that in addition, VAA management was concerned that the departure of an incumbent caterer would jeopardize the existing competitive market for full-service in-flight catering at YVR. Specifically, if one of the full-service incumbents were displaced by a caterer that, for example, offered

only non-perishable products, then that would leave only one supplier of fresh meals in the market. The result would be less competition and fewer choices for airlines.

2.1.56 In Section 3.2 I discuss the fragmentation of the airline business model that resulted in the dramatic reduction in catering demand by airlines for continental flights. In Section 3.4 I observed growth of long haul and ultra long haul routes. For these flights, full service fresh catering is essential and a matter addressed in airport marketing. Retaining for carriers a competitive choice of fresh caterers is thus an important marketing objective.

2.1.57 It is thus my opinion that VAA's concern that it should have at least two competing full-service in-flight catering choices, available especially for long haul air carriers but also for the catering needs of some continental flights appears reasonable.

2.1.58 In conclusion, it is my opinion that the rationale offered by VAA management appears reasonable having regard to the history of in-flight catering services at YVR and the economics of downstream catering and further downstream airline services, and is consistent with my answers to questions 1 through 3.

Update: While my update information on catering spending by U.S. and Canadian air carriers has increased, that increase, adjusted for inflation and traffic, is a) modest, b) non-substantive, and c) could not have been anticipated by VIAA in 2014.

3.0 Evolution in the Demand for In-flight Catering Services

3.1 Markets

3.1.1 Before I address the evolution in either the demand or supply of in-flight catering services, it would be helpful to provide a brief overview of the markets at issue in this proceeding. I note that I have not been asked to analyse these markets for competition law purposes and so the discussion below is for descriptive purposes only.

3.1.2 There are three markets relevant to the questions considered in my report. The first is the market for in-flight catering services. The second is the market for airport access for caterers. The third is the market for airline services, into which in-flight catering services are an input.

3.1.3 In-flight catering services

In general, airlines purchase the food, beverages and other items prepared by professional catering firms. At one time, many airlines participated in this market themselves, by self-catering, but, today few airlines self-cater and instead purchase catering products/services from specialist catering firms.

3.1.4 Airlines do, however, double cater. This is the practice of loading catering for both an outbound and return flight at the origin station, thus not requiring catering at the destination station. I am advised that Alaska and Horizon Airlines each double cater certain flights to YVR from their origins in Seattle and Portland.

3.1.5 A related practice is “ferrying”, where catering is loaded in a different airport than that from which a flight departs, although not necessarily the other side of the city pair connected by the second flight. Food can also be trucked from a remote location to an airport for loading onto aircraft. I am advised that Air Canada sources frozen entrées from an entity named Delta Daily Foods located near the Dorval airport in Montréal.

3.1.6 VAA is not in the business of supplying catering services to airlines. While some airports outside of North America do supply catering services to airlines, usually through a subsidiary company, that is not the practice in Canada or the U.S.

3.1.7 In-flight catering services is a specialized field that has been going through major transformations in terms of declining use of and spending by airlines on catering, both in total and especially on a per passenger basis. The industry has also experienced significant consolidation. This is further discussed in Section 4, below. More recently, some participants in the airline catering industry have begun to invest in automation and information technologies to facilitate carriers that wish to allow passengers to pre-order paid meals and other catering services.

3.1.8 Airport Access for Caterers

Subject to the exceptions noted above, in-flight catering services to airlines require airport access in order to service their airline customers. This access can be provided by a combination of providing airport land on or near the security fence. The airport operator also provides authorization for access through the security fence in order to service aircraft. In this market, the airport operator is the seller and catering firms (or airlines doing their own catering) are the buyers.

3.1.9 VAA is a supplier in the market for airport access for caterers.

3.1.10 Airline services

Downstream from the market for in-flight catering services to airlines is the market for airline services to passengers.

3.1.11 In-flight catering services are an input to the market for airline services; i.e., catering firms are suppliers to the airlines who provide airline services. I note that it is the services of the airline market that provides communities with economic and social connectivity. This is an issue to which I will return in Section 4.

3.1.12 As indicated above, providers of airline and catering services can be vertically integrated, with the airline self-catering. This was generally the case thirty to forty years ago, but today vertical integration is less common. At YVR, there have been cases of self-catering. Recently WestJet self-catered at YVR.

3.1.13 The market for airline services is of course much larger than the market for in-flight catering. A 2006 report by the International Air Transport Association (IATA) provided figures estimated by McKinsey & Company on the revenues and investment of value chain providers in the commercial aviation sector.[12] Figure 3-1 reproduces this figure. As can be seen, catering revenues of roughly US $11 billion represented roughly 3% of airline revenues of US $315 billion.

Figure 3-1
Revenue and Investment of Sectors in the Commercial Aviation Industry
2004

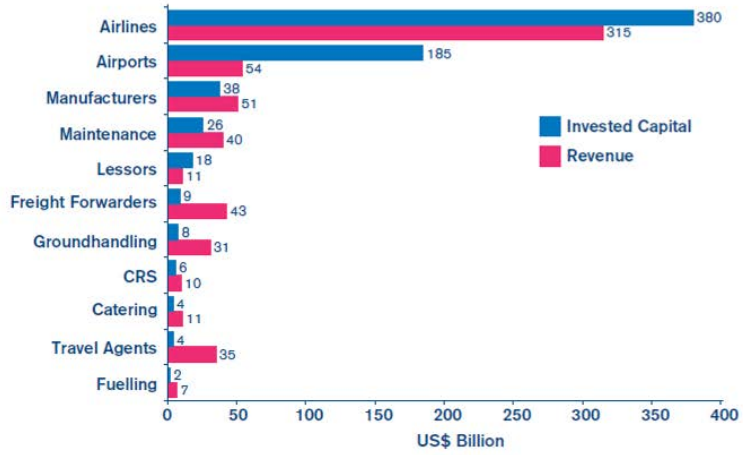


Figure 5.4: Invested Capital and Annual Revenues by Sector

Source: IATA 2004

3.2 Fragmentation of airline business model and related unbundling of the airline product

3.2.1 Until the removal of economic regulations on air carriers in the late 1970s in the U.S. and in the mid-1980s in Canada,[13] virtually all air carriers were Full Service Airlines (FSA) of various sizes and a

[12] IATA, Value Chain Profitability, IATA Economics Briefing 04, June 2006.

[13] In the regulated era, the government determined which routes and airline could fly and what price could be charged. In Canada regulation also included government determination of how many flights could be operated on a given route and what

small number of charter services whose onboard product was similar to that of FSAs.[14] Almost all of these airlines served complementary fresh catered meals to passengers, even on flights as short as one hour. FSAs are often referred to as legacy network airlines.

3.2.2 After deregulation new business models emerged, in particular Low Cost Carriers (LCCs) and "Ultra" Low Cost Carriers (ULCCs).

3.2.3 Traditionally, LCCs were defined as those airlines able to operate at lower unit costs than the legacy network airlines because of a number of factors, most notably lower labor costs and fundamentally different business models. The LCC business model has evolved but generally has a strong focus on lower costs, in part by unbundling the airline service. From the beginning, LCCs did not provide complementary onboard fresh catering to its customers, instead providing minimal commissary type catering or buy-on-board commissary catering, which became a revenue and profit centre for the LCC rather than the cost centre that it was for FSAs. The LCCs unbundled other aspects of the airline service.

3.2.4 ULCCs emerged in the more recent past, offering limited service to particular destinations – often leisure destinations – at lower levels of frequency than other commercial airlines. ULCCs might be thought of as a further progression of the LCC business model, with even greater unbundling, such as charging for any checked bag, for advanced seating assignments, priority boarding, etc.

3.2.5 I note that many LCCs have been evolving toward a more full service larger network business model. WestJet, for example, now operates hubs and some intercontinental services (which it intends to extend, including service to Asia). A number of LCCs and some FSAs have launched their own ULCC airlines: Swoop in the case of WestJet and Rouge in the case of Air Canada.

3.3 Dramatic reduction in overall airline catering demand

3.3.1 Driven in part by 40 years of airline deregulation, airlines operating short and medium haul services reduced their demand for catering services, typically eliminating complementary fresh catered meals in economy class.

3.3.2 This impact was immediate for the small start-up carriers that emerged after deregulation, who were not encumbered by existing business practices and customer expectations. As these carriers grew and took a larger share of these markets, the legacy carriers responded by also reducing catering demand.

3.3.3 US data

It is possible to quantify the reduction in catering demand by airlines. The U.S. Department of Transport collects data specifically on catering spending by U.S. airlines and this can be used to view the trend in catering demand by U.S. airlines.[15]

3.3.4 Figure 3-2 shows catering spending by U.S. airlines from 1990 to 2016 in current (nominal dollars).[16] Figure 3-3 shows this spending in real (inflation adjusted) terms. From this figure one can

size aircraft could be used. Deregulation gave carriers the ability to choose routes, aircraft, frequency of service and the prices to be charged.

[14] An example of such a charter carrier was Wardair the operated transcontinental, intercontinental and sunspot charter flights. It was well known for its onboard fresh catering. See for example *The Max Ward Story,* McClelland & Stewart publishing, 1991, p. 173.

[15] The source of the data is the DoT required Form 41annual filing of traffic and financial data. This data is publicly available.

[16] 1990 is the earliest year for which online access is available for the data.

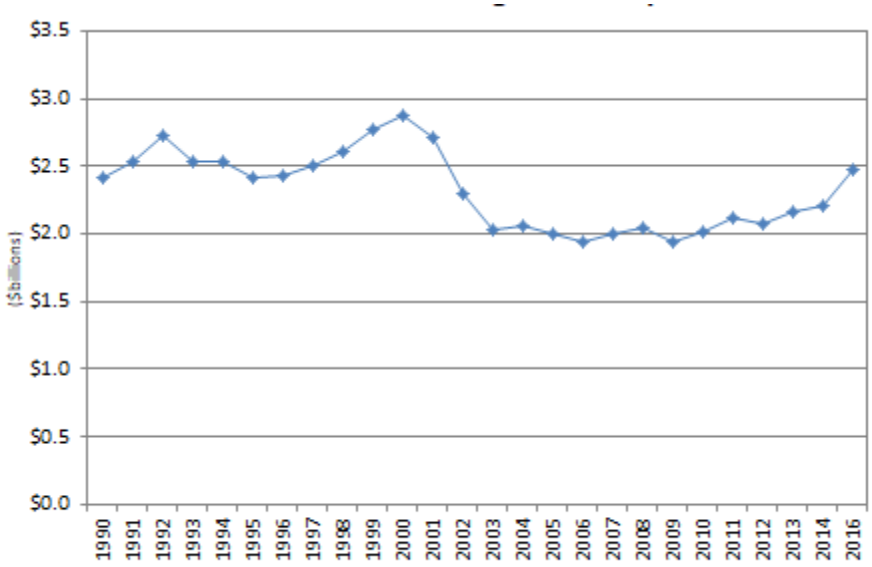
observe a significant reduction in spending by airlines, in spite of significant growth in air travel demand, measured by the number of passengers.[17]

3.3.5 Even more revealing are Figures 3-4 and 3-5. The former shows real catering spending per passenger in which there has been a 65% reduction since 1992. Figure 4-5 shows US catering spending as a percent of total operating revenues, which has dropped from a peak of 3.5% to roughly 1.4%.

3.3.6 More recently, there has been some reversal in the downward trend in catering spending, particularly with recovery of the airline industry since 2014, but current levels are still well below the previous highs pre-2000.

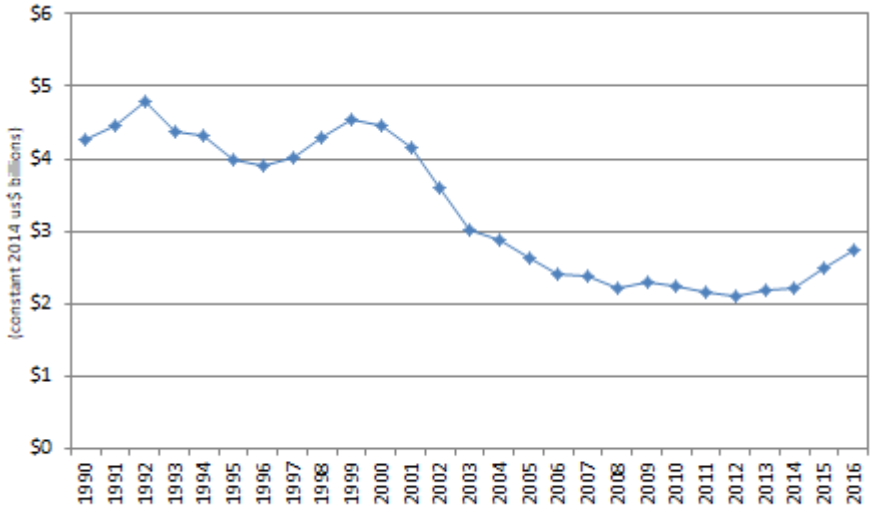
[17] Food expense data is from Form 41, Schedule P-6 while total operating expense is from Form 41, Schedule P-1.1 and P-1.2.

Figure 3-2
Annual U.S. Airline Passenger Food Expense
Current (nominal) dollars
1990-2015



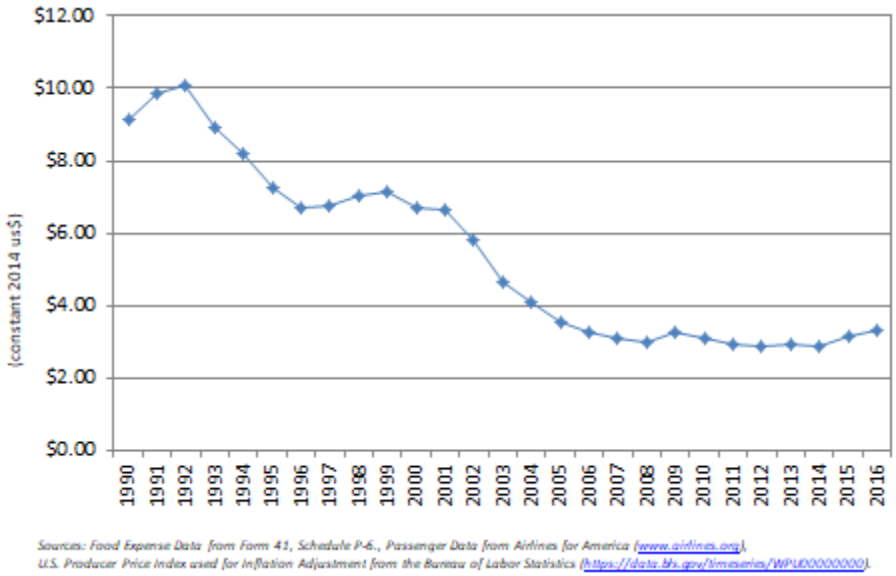
Source: Form 41, Schedule P-6.

Figure 3-3
Annual U.S. Airline Passenger Food Expense
Real (inflation adjusted) dollars
1990-2015



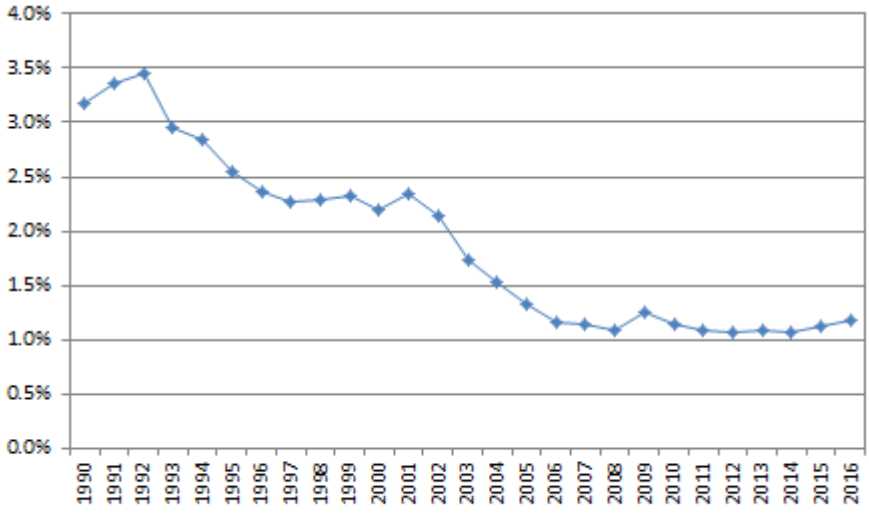
Sources: Form 41, Schedule P-6. U.S. Producer Price Index used for Inflation Adjustment from the Bureau of Labor Statistics (https://data.bls.gov/timeseries/WPU00000000).

Figure 3-4
Annual U.S. Airline Passenger Food Expense *Per Passenger*
Real dollars
1990-2015



Sources: Food Expense Data from Form 41, Schedule P-6., Passenger Data from Airlines for America (www.airlines.org).
U.S. Producer Price Index used for Inflation Adjustment from the Bureau of Labor Statistics (https://data.bls.gov/timeseries/WPU00000000).

Figure 3-5
Annual U.S. Airline Passenger Food Expense as a Percentage of Total Operating Revenues
1990-2015



Source: Food Expense Data from Form 41, Schedule P-6., Total Operating Revenue Data from Form 41, Schedule P-1.1 and Schedule P-1.2.

3.3.7 Canada data

Similar specific data regarding catering expenditure are not publicly available in Canada. However, some

information can be gleaned from the annual reports of Air Canada and WestJet.

3.3.8 In 2016, Air Canada's Annual Report indicates that food, beverage and supplies of $349 million amounted to only 2.3% of its $14,677 million in revenues.[18] This cost category includes items other than catering and thus this overstates actual catering costs.

3.3.9 For WestJet, the amount expended on food, beverage and supplies was so low it was not even itemized separately in its 2016 Annual Report, and merely included in "other expenses", a catch all category that represents 7% of revenue.

3.3.10 While catering costs are of concern to airlines, relative to other airline costs, catering is one of the smallest operating cost items for airlines. Of far greater significance to airlines are labour costs, fuel costs, aircraft leasing and ownership costs, maintenance costs, etc. Marketing and sales costs (such as commissions paid to online travel agencies) far exceed the cost of catering.[19] The small share of catering cost relative to overall airline costs can be appreciated by the observation that Air Canada's annual passenger revenues are $14.7 billion and those of WestJet are $4.1 billion.[20]

Update on the reduction in catering demand

In Appendix J I provide updated graphs of the data in Figures 3-2 to 3-5, above. I refer to these new figures as "Figures 3-2 updated" to "Figure 3-3 Updated". The figures are updated by adding data for 2017 from the same source.

- Figure 3-2 updated
  indicates that total spending, not adjusted for inflation, is up considerably, roughly equivalent to levels of the early 1990s and around the year 2000.
- Figure 3-3 updated
  indicates that after adjusting for inflation, total catering spending, while rising somewhat in the last 3 years, is still down almost 40% since the peak in 1992.
- Figure 3-4 updated
  puts the growth in catering spending in the context of traffic growth. U.S. catering spending per passengers is still only 34% of the 1992 peak. The industry has shed roughly 2/3 of the spending on catering per passenger.
- Figure 3-5 updated
  shows that catering spending as a percent of airline operating revenue has only increased slightly, to 1.25% versus 3.5% in 1992.

I also have updated the Canadian data discussed above in paragraphs 3.3.7 to 3.3.10, again by adding data for 2017 from the same source – in this case the 2017 annual reports of Air Canada and WestJet.

- Air Canada's food, beverage and supplies expense for 2017 of $383 million grew by 9.7% compare to revenue growth of 10.7% and operating expense growth of 11.7%.[21] This resulted in a minor

[18] This is 2.4% of costs (operating costs plus non-operating costs. Air Canada Annual Report 2016.

[19] Air Canada's 2016 annual report indicates sales and distribution costs of $703 million (4.8% of total revenue), compared with $349 million for food beverage and supplies expense (2.4% of total revenue). The latter, however, includes supplies other than for catering.

[20] Air Canada Annual Report 2016, WestJet Annual Report 2016.

[21] Air Canada Annual Report 2017.

decrease in these expenses as a percent of revenues (2.36% versus 2.38% previously). Again, the category of expense includes items other than catering costs.

- For WestJet, "other" expenses increased by 13.4% compared with revenue growth of 9.2% and thus the percent of other expenses in revenue increased slightly from 7.1% to 7.3%.[22] During this period, WestJet increased its overseas flying. Again, this category includes many expenses other than catering.

The new data does not change my previously opinions on the questions put to me by counsel.

3.4 Growth of long haul and ultra long haul routes and the impacts on demand for catering services

3.4.1 There is no precise universal definition of what constitutes a long haul route. In general, I use the term to denote a flight that from YVR would be intercontinental in nature, typically involving flying time in excess of 8 hours.

3.4.2 Ultra long haul routes are a recent development, and enable flights of much greater distance and duration. These routes had to await development of very long range aircraft, which now are able to operate routes of up to 16 hour duration, such as that from YVR to Melbourne Australia, a distance of roughly 8,200 statute miles or 13,200 kilometres. Ultra long haul routes require two or more shifts of pilots and flight attendants and special rest areas for the flight crew.

3.4.3 Long haul and ultra long haul routes have been made possible by advances in engine and aircraft technology. The earliest long-distance flights with aircraft such as the classic Boeing 707 required technical stops for refueling. The emergence and evolution of widebody aircraft such as the Boeing 747 in 1970 to the recent Boeing 787 (and Airbus models such as the A380 and A350) have allowed for flights of 15 and even 17 hours and longer. United Airlines operates what is regarded as the world's longest nonstop flight, between Los Angeles and Singapore, covering 8,700 miles and requiring 17 hours and 55 minutes' flight time.[23]

3.4.4 These long haul flights all require fresh catering. Non fresh, commissary type meals such as snack boxes, candy bars and packages of nuts are generally not acceptable to the travelling public as the sole food options for these long haul flights. Pilots and flight attendant crew also require fresh catering.

3.4.5 Further, these flights typically will require 2-3 meals per passenger.

3.4.6 I note that a few carriers, such as WestJet, do not provide *complementary* on board fresh catering for passengers on their long haul flights. However, they do provide fresh catering, but for a fee, either ordered and paid for in advance, or on board the aircraft. Some major caterers are investing in information technology systems to facilitate pre-ordering of a variety of paid fresh meals for long haul flights.

3.4.7 For the overwhelming majority of long haul flights, catering is an important quality dimension – price is less important for these routes.[24] The airlines are competing more on the basis of service, with considerations of seating, in-flight entertainment, and meal quality all being important differentiators.

---

[22] WestJet Annual Report 2017.

[23] http://www.telegraph.co.uk/travel/maps-and-graphics/the-longest-flights-in-the-world/world-s-longest-flights-4/

[24] The lower air fare elasticity of long haul flights is noted in an airfare elasticity report commissioned by IATA and conducted by InterVISTAS: "Estimating Air Travel Demand Elasticities," December 2007. See page iv.

3.4.8 This is especially but not exclusively true in business class. Airlines are investing heavily in the product offerings for this market segment. Many airlines operating long haul routes, including both FSAs and LCCs, have also introduced 'premium economy' cabins which provide greater comfort, including enhanced catering services, at a somewhat higher price. I have noted that LCC WestJet provides fresh catering on board their long haul flights. They provide this as a complementary service for the premium economy product and for an add-on fee for regular economy customers. In its roll out of its announcement that it has ordered long haul 787 aircraft and that it is applying for route rights from Canada to China, the carrier's CEO has stated that it is now developing a family of airlines and services, which will range from its ULCC Swoop services to high(er) end services on its long haul 787 intercontinental services.

3.5 Fresh catering services is customized to each airline

3.5.1 There are also issues of service quality and airline-specific catering product differentiation that affect the relationship between caterer and airline.

3.5.2 Long haul airlines typically require fresh caterers to prepare and load a wide variety of meals and snacks. These are unique to each airline and deal with issues of religious requirements in food choices and method of preparation, dietary restrictions, national taste preferences, etc.

3.5.3 The catering product is thus customized for each carrier and is not a commodity product. The relationship between caterer and airline is based in large part on service delivery. While the price of the service is a factor, the ability of the caterer to meet the differing standards set by each airline it serves, particularly for business/first class and long/ultra-long haul travelers, is a key dimension.

3.6 Recent volatility in commercial aviation in Canada

3.6.1 Over the past two decades, commercial aviation in Canada has been volatile due to a number of factors that influenced the volume of passenger traffic, the number of destinations with service, the number of flights and the profitability of air carriers. Among these disruptions have been:

- When VAA first started operating YVR, its major carrier was Canadian Airlines, but this carrier struggled for financial viability throughout the 1990s.
- The 1997 Asian flu reduced travel to/from Asia, a sector that had been expected to be YVR's fastest source of long term growth.
- The 2000 merger of Canadian Airlines into Air Canada, which resulted in a loss of seat capacity and a reduction in routes served. The effect was not merely on these two Canadian carriers but also other carriers. For example, with the loss of domestic feed traffic from Canadian Airlines, Malaysia Airlines dropped its flights from Kuala Lumpur and Taipei. (The Canadian flight to Taipei was also dropped and AC did not pick up the route itself.) Similarly American Airlines dropped its routes to some destinations such as Boston and New York and reduced its seat capacity on its remaining routes.
- Consequent to the merger, in my opinion Air Canada dehubbed its operations at YVR. It cancelled some destinations (e.g., Taipei), ended the former feeder and alliance relations of Canadian with foreign carriers for beyond-the-gateway access, reduced capacity on intercontinental routes by substituting smaller aircraft, and retimed flights so that former convenient connections were lost. While Vancouver was being dehubbed, Air Canada was building its hub in Toronto, channelling traffic from origins such as Montreal and Ottawa to feed Asian and west coast US destination that

formerly flew via Vancouver to Air Canada's increasing number of Toronto flights to these destinations.

- The 2000-2001 recession in the U.S. and the near recession in Canada.
- The effect of 9/11, which closed airports at first and then profoundly reduced the level of air travel for several years.
- The 2003 bankruptcy of Air Canada which financially affected airports such as YVR and saw further reductions in the size of the AC fleet and the seat capacity it offered from YVR.
- The global financial crisis of 2008 and the subsequent/coincident recession.

3.7 Market disruption in catering and impact on airline services

3.7.1 Should one caterer cease operations, it is not a trivial matter for a replacement to be able to service the unique product needs of an airline on short or even medium term notice. This is one reason for consolidation of caterers across airports.

3.7.2 If a major caterer ceases operation, a new supplier would have to be able to meet the exacting standards and regulatory compliance requirements of the airlines once served by the former caterer and to do so at multiple locations. Even for an existing caterer to take over the business of a defunct caterer at a specific airport (which necessarily reduces the number of market participants) would be a significant challenge that would likely take time for the transition. The transition involves increasing capacity in terms of equipment and employees, and developing meals and meal preparation that meet the brand specific requirements of the airlines. This all takes time.

3.7.3 A disruptive transition will impose significant operating and customer service costs on an airline. These costs include those discussed above, as well as the opportunity cost of a loss of customer loyalty that might occur as a result of unmet service standards over even a relatively brief period of time.

3.7.4 Some airlines catering needs likely could be dealt with. Continental flights can double cater their commissary catering needs, although at higher operating costs and fuel use, and the modest number of fresh meals needed for business class could be double catered as well.

3.7.5 However for long haul flights, which require substantial fresh catering, double catering would be expensive, meal quality likely would be degraded, and the space limitations on a wide body aircraft that needs to serve 4-6 meals for a round trip and store the accompanying refuse, make this option impractical.

3.7.6 Even where the airline finds some means of dealing with the catering problem of these flights, mistakes will be made, misconnecting passengers are likely to find their special meals are not on board, aircraft will be delayed at gates awaiting the cobbled together catering and thus airline labour costs will go up and the customer service costs of mis connected passengers will be high.

3.7.7 Passengers with special dietary or religious needs can be especially problematic for the airline. The wrong meal for these passengers can be traumatic and potentially a health problem. The reaction of such passengers on board the aircraft can be problem for the airline crew and a poor customer service experience for other passengers on the flight.

3.7.8 Finding replacement catering would be problematic as the thin margins of catering do not support these businesses operating with extra capacity – either in the physical facilities they need, or with trained labour. The replacement carrier will need to plan and consistently deliver the unique catering product desired by each carrier.

4.0 Supply of In-flight Catering Services

4.1 Alternative supply models for in-flight catering

4.1.1 There are a range of supply models for in-flight catering services. These include:

- Fresh catering by independent full service fresh caterers.
  This supply option is available from two full-service in-flight catering firms at YVR, Gate Gourmet and CLS.
- Commissary catering by either full service caterers or commissary specialist caterers.
  This service is supplied at YVR by the two full-service in-flight caterers.
- Airline self-cater of fresh catering.
  For many years, CP Air (a predecessor of Canadian Airlines) self-catered its YVR fresh catering needs from its operations centre on Grant McConachie Way. This business was later sold to Sky Chefs.
- Airline self-catering of commissary catering.
  Until recently, WestJet self-catered its needs at YVR.
- Airline double-catering or "ferrying".
  This involves double catering flights so that catering is loaded for both the outbound and return flights. At YVR, Alaska Airlines and Horizon Air double cater flights into YVR.[25] Air Canada does some double catering/ferrying at YVR of certain frozen meals from the Montréal kitchen of Delta Daily.
- Third party off-site fresh catering.
  This involves catering provided to airlines by a catering company located off airport property. The catering company does not lease land from the airport operator, but does need a licence to access the airside in order to service aircraft. Service quality to airlines can be lower. Due to the risk of lower service reliability, it is preferable for catering to be provided from a location on Sea Island.
- Third party off-site commissary catering.
  This is similar to above but only for commissary catering needs.

4.1.2 In-flight catering services is a specialized field that has been going through major transformations in terms of declining use of and spending by airlines on catering, both in total and especially on a per passenger basis. The industry has experienced significant consolidation. The major firms that are in the fresh catering segment of the airline catering market are generally long established and highly competitive.

4.1.3 Commissary catering

Largely since the mid-1990s, when low cost carriers became a large enough portion of the airline market to affect the legacy full service network carriers, almost all airlines serving regional and continental routes

[25] When fresh catering needs for a continental flight are confined to the business/first class cabin, plus some buy-on-board fresh catering choices, double catering does not overtax the food storage space on-board an aircraft. This is unlike the case of long haul flights where all or most passengers require multiple meals in each direction of the flight.

have dramatically reduced their economy cabin catering programs for continental flights. (Continental flights include short haul regional and medium haul flights within Canada, and include transborder services to/from the U.S., as well as Mexico and Caribbean sunspot destinations.)

4.1.4 For the economy cabin on these flights, airlines now typically provide no complementary fresh meal service and instead sell "buy on board" prepackaged foods and beverages with modest or long shelf lives. An example of a product with a modest shelf life is sandwiches, and an example of a product with a long shelf life would be 'snack boxes'. I refer to this segment of the market as 'commissary' catering. Some speciality commissary catering firms have emerged. Full-service fresh food caterers are also able to supply this market and often can do so at only a modest incremental cost to their full service fresh services. Commissary catering is simple enough that minimal investment is required and no special facilities or staff may be needed.

4.1.5 Some carriers have no premium (e.g., business class) cabin and thus commissary catering may be the only catering service they require, which can be supplied by either a full service fresh caterer, or a specialist commissary caterer.

4.1.6 Fresh catering

This is the full service segment of the airline catering market. Caterers prepare fresh meals that are differentiated by airlines and that involve a large number of meals for each airline. Meals often vary by day so that frequent travellers get a variety, and they vary by passenger preferences such as meals for unique diet/allergy requirements, different religious requirements/prohibitions, etc. Fresh catering supply requires investment in substantive and specialized facilities.

4.1.7 I note that while these two segments have emerged, full-service fresh food caterers can and do supply commissary catering (and may be the largest suppliers of commissary catering). As well, airlines will often purchase both their fresh catering and commissary catering at a given station (i.e., an airport) from the same fresh catering firm.

4.2 Facility Requirements

4.2.1 The facilities for catering are specialized and are not the same as for cargo, aircraft maintenance, or ground handling, three of the important airline support services needed at an airport. A full kitchen requires ovens, freezers, temperature controlled storage, bonded storage, cleaning facilities that meet stringent health requirements, and areas for the production of trays and assembly of carts. There is a need for specialized equipment to transport the assembled carts from the facilities to the flight deck of the aircraft being served. The capital costs to build and equip a catering kitchen and production facility are thus significant. Catering space is usually not high cube space and thus is not easily convertible to other airport uses such as for cargo, aircraft maintenance and airfield maintenance and support which require high cube space.

4.2.2 There is also a strong preference for airside access for such facilities, or operation at a location within only a minute or so from an airside security gate. This is particularly relevant in the case of YVR, which is located on an island (Sea Island) that often experiences roadway congestion and hence unreliable access from off airport sites. There is limited land on Sea Island that is not managed by VAA, and much of that has dedicated uses such as the Canada Coast Guard facility, the B.C. Institute of

Technology Aviation Campus on the South Airport, and a major hotel.[26]

4.2.3 There is only one bridge connecting the airport to neighbouring Vancouver and three bridges connecting it to Richmond. One of these has two spans, with one span consisting of a swing bridge that can open at unpredictable and inconvenient times for marine traffic. All of these bridges carry Vancouver-Richmond commuter and business traffic (i.e., non-airport traffic) and suffer from serious delays during peak hours. Peak hours now constitute three time periods (morning commute, extended afternoon commute, and a noon traffic peak, especially to the restaurants and shopping in North Richmond). Traffic inbound from Richmond headed to Vancouver typically backs up the entire length of the road on South Sea Island and across the bridges into Richmond. Commutes (I note that I commute daily in this traffic lane) at peak times through the airport are frequently 15 to 30 minutes. Traffic congestion is now bidirectional, as Richmond has more jobs than working age residents and there are traffic delays in both directions in all three peak periods. There are other traffic issues associated with accidents on the bridges or their approaches.

4.2.4 The congestion during peak period traffic, or an accident at any time of day, or a bridge span opening can result in congestion that could easily mean trays and carts assembled off-site not being available at flight time. This could result in flight delays, which can be costly for airlines. This bridge span effect is not confined only to the outbound direction. Once a vehicle returning from YVR to the off island catering facility is delayed, it will be late for their next inbound movement.

4.2.5 The potential for road disruptions increases the greater the distance to be travelled, and especially when any of the bridges must be utilized. Therefore, the further away from airside of a catering facility, service reliability decreases, potentially exponentially.

4.2.6 In addition, flight manifests can change on short notice, impacting the catering demands for each flight. Last minute changes can be far more readily handled by an airside caterer, or one close to an airside gate such as Gate Gourmet and CLS, than by a production facility located off Sea Island.[27]

4.2.7 Since reliability of service is of great importance, catering activities undertaken off-airport, especially for YVR's island location, face greater challenges in meeting the required reliability standards.

4.2.8 Agricultural regulatory requirements regarding international waste disposal are very stringent, both for human health reasons and for protection of local flora and fauna. This adds to the cost of catering operations and contributes to economies of scale.

4.3 Impact of Delays on Airline Operations and Costs

4.3.1 Congestion and delays affect *airlines* in a number of ways that may include:

- Additional operating expenses in the form of compensation to crew members for overtime pay caused by delays or the cost of additional fuel used to meet the targeted arrival time if flight departure is delayed;

[26] There is a very small building at the northeast corner of island that is managed by the Vancouver Fraser Port Authority, and was strategically located for managing the North Arm of the Fraser River. Other lands on the North side of the airport are a conservation area.

[27] Last minute catering changes can be due to a range for factors. For example a change in the passenger count in economy and business/first class cabins, a cancelled flight, a passenger requiring special dietary or religious meals that has been assigned to another flight, a change of aircraft due to a maintenance issue, and misconnected passengers accommodated on different flights.

- Expenses associated with schedule adjustments. Airline fleet schedules and aircraft utilization rates depend on scheduled flight times. Even a moderate amount of delays affecting flight schedules may cause significant disruptions to airline operations and entail additional costs of rescheduling and aircraft repositioning;
- Expenses associated with accommodating disrupted passengers. Consider the case of a passenger who managed to get on the first flight of his itinerary but missed the second connecting flight due to delays at the airport where the passenger's trip originated. The airline would incur the additional expenses of accommodating the passenger at the point of connection (hotel, meal vouchers, taxi, etc.). In addition, the airline would forego sales revenue from the seat occupied by the disrupted passenger on the next connecting flight. The airline may require additional human resources such as gate agents, luggage handlers, reservation agents and customer service representatives in order to accommodate the needs of disrupted or delayed passengers; and
- Other non-tangible costs. Delays and disruptions negatively reflect on the reputation of airlines, even if such delays are not related to airline internal problems. Reputational costs, although more difficult to quantify, nonetheless add to the impact of delays on airlines.

4.3.2 Note that delay costs can affect not only the airline flight first delayed, but other flights as well. An aircraft with a delayed departure can cause an arriving aircraft to be held on the apron until the gate is available. Even if the flight is switched to another gate there will be a delay while waiting for staff, serving vehicles, etc. to be informed of the change and then moving people and vehicles and baggage to the new gate. Commonly, when one flight is reassigned to another gate, the aircraft originally assigned to that gate will now have to be transferred, or held.

4.3.3 These costs can also impact *airports*, as there could be costs borne by airports associated with accommodating delayed or disrupted flights, and impacts on the reputation of the airport for other airlines, which may be delayed during the process. This is particularly true for an airport operating in a gate-constrained environment, such as at YVR, where changes to the gate allocations/timing are difficult to implement.

4.3.4 An airport with increased aircraft time on gates will ultimately need to increase the size of its terminal and the ramp on the airside. Gate and ramp capital costs are significant for an airport.

4.3.5 Recent empirical studies have revealed that the per-minute cost to airlines of delays increases as delays get longer. A 2007 study conducted by Boeing[28] analysed the impact of disruption induced delays on airline costs. Key observations from the study are:

- Delays in aircraft departure result in increased airline costs that can be broadly grouped into four categories: operating costs for airlines, costs of aircraft unavailability, costs to airline brand value and airline network costs.
- Delay costs per minute increase with delay length. Thus, the relationship between delay costs per minute and the length of delay in minutes can be described by an "accelerating" cost curve. The study estimates that the average delay cost for B737 is $73 per minute (earlier studies used a constant delays cost of $21 per minute.

4.3.6 A 2010 study sponsored by the U.S. Federal Aviation Administration (FAA) provided a

[28] Boeing, "Disruption Costing Methodology ValSim – Visualization and Simulation of Airline Operations", Denver 2007.

comprehensive overview of system-wide flight delays in 2007 on airlines, air travellers and the economy of the United States.[29] The study assessed the total economic impact of flight delays caused by aviation system capacity constraints and airline internal disruptions. [30] The study concludes the following:

> "Of particular interest to this study are the delay variables, the estimates of which support our hypothesis that excessive flight time affects airline cost. The coefficient estimates are significant and rather consistent between these two models. The coefficients suggest that, at the sample mean, one minute increase in delay would cause around 0.6% increase in variable cost. This study is also illustrative of the notion that longer delays result in higher per minute costs compared to shorter delays."

4.3.7 Delays are a major concern of the airline industry as a whole; an airport can get a negative reputation for delays which can affect its ability to attract and retain flights.

4.4 Numbers of catering firms at airports

Update: The end of Section 4.4 provides an update. The text until that point is unchanged from my original January 2018 Statement.

4.4.1 Although every airport is different and may have unique drivers for the number of its in-flight catering firms, empirically we can observe that there are few in-flight catering competitors at any given airport in Canada and the United States, even at the largest airports.

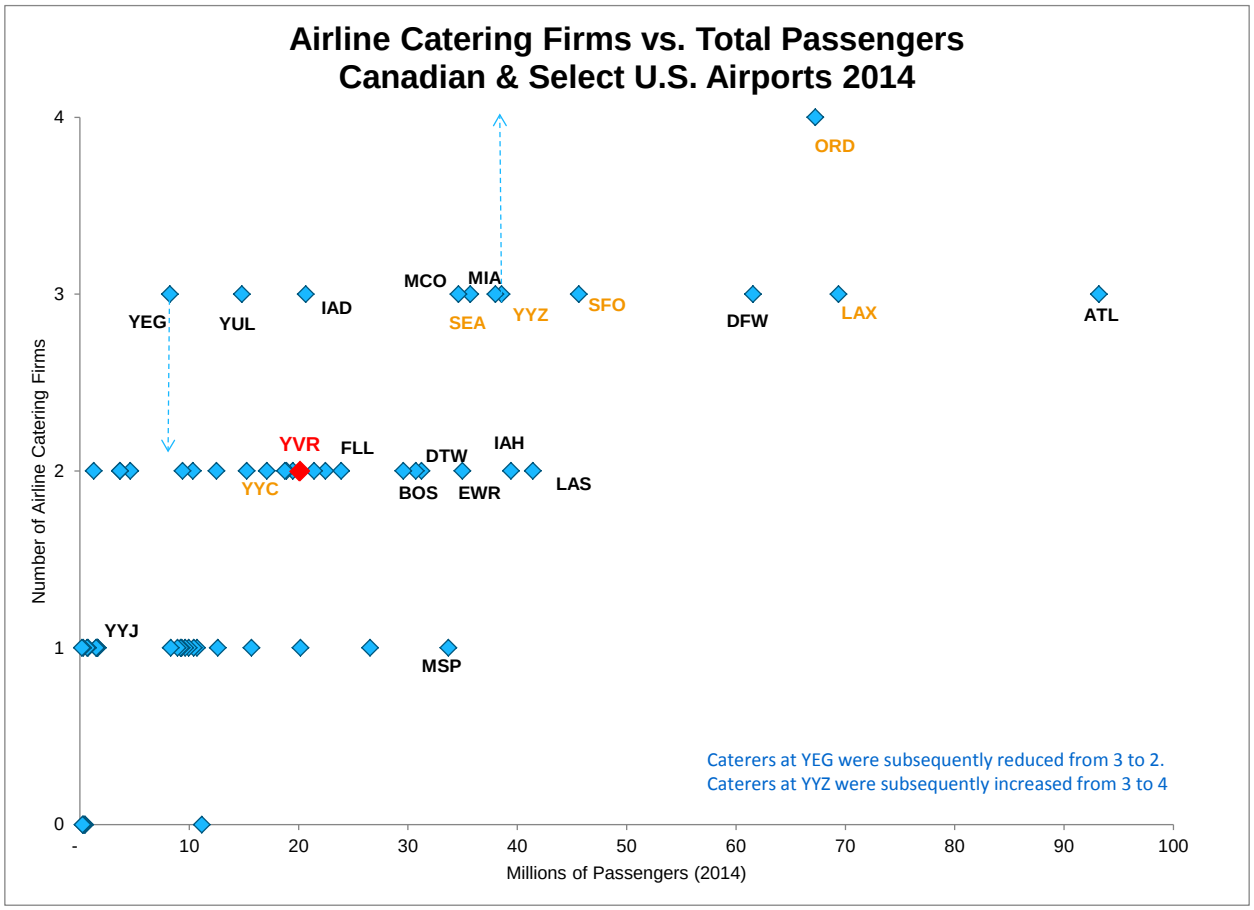
4.4.2 Figure 4-1 below illustrates the relationships for a sample of 63 airports between the total number of passengers at airports in Canada and the United States and the number of catering firms operating at each airport in calendar year 2014.[31]

[29] NEXTOR, "Total Delay Impact Study: A Comprehensive Assessment of the Costs and Impacts of Flight Delay in the United States", Revised Final Report, November 2010.

[30] The study used a statistical cost estimation approach as an empirical basis for translating delays into monetary terms that reflect impact on airlines. The main advantage of this methodological approach is that it relies on a minimum of assumptions about the delay-cost interaction mechanism. This provides a defensible justification for applying the delay-costs measurement estimated in this study to other settings, such as estimating the impact of reduced delays at airport security checkpoints on airline costs.

[31] I specified the sample of airports. It was intended to provide a sample size greater than 50 airports, include many of the largest airports in Canada, and complement these with a greater number of airports in the U.S. The largest airports in North America were included to secure the top end of the relationship, if any, with size of airport (measured in terms of passengers), with an adequate number of airports that were both larger and smaller. The data were developed by a combination of internet research on both airports and the major catering firms, complemented with a number of interviews with appropriate airport managers. Edmonton was excluded from the graph as it had just increased from 2 to 3 caterers and now has only 2. Toronto subsequently increased from 3 to 4 caterers.

Figure 4-1
Airline Catering Firms versus *Total* Passengers
at Canadian & Select U.S. Airports
2014



Source: 2014 Total Passenger Traffic: US Airports: T-100 data From DIIO; Canadian Airports: ACI World Air Traffic Report, 2014, Statistics Canada Air Carrier Traffic at Canadian Airports, 2014 & airport site statistics. Number of catering firms obtained from 2014 Inter*VISTAS* survey of airports.[32] Data is provided in Appendix F.

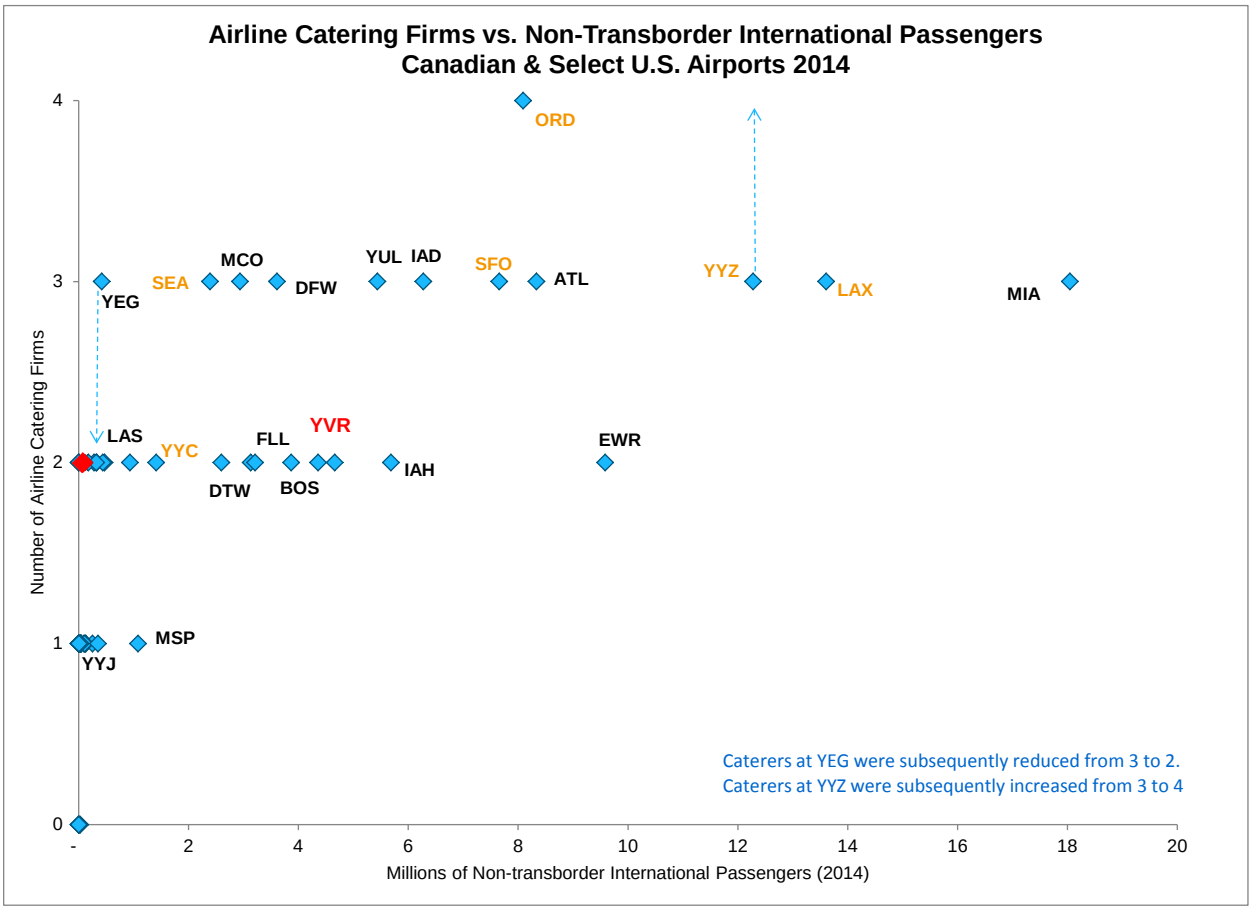
[32] An informal survey of airports was conducted to ascertain the number of airline catering firms that operate at each airport. There were three main methods used to conduct the survey: calling airports directly, using client relationships to contact departments at select airports, and where direct confirmation was not available, internet research. The process for internet research included reviewing tenant lists and master plans for information on the catering companies or the number of catering sites allocated under the master plan. In some cases InterVISTAS had access to confidential secondary materials, such as surveys of employers from InterVISTAS conducted economic impact studies. Minor catering operations, such as FBOs preparing a very small number of meals for private general aviation private or air taxi flights were not included. Such specialty operations do not have the scale or reliability to serve commercial aviation flights.

4.4.3 YVR's position relative to these other airports is shown as a red diamond marker. There are few airports of comparable size that have three caterers. Most airports with three caterers are substantially larger than YVR measured by total number of passengers. Indeed, there are a number of similarly sized airports, or even larger, that have only one caterer. Therefore, with 2 caterers at present, YVR does not appear to be an outlier, with too many or too few caterers based on its size. The outlier among airports with three caterers was Edmonton (YEG) with three caterers for a total traffic base of roughly 8 million passengers (with only 420,000 international passengers).

4.4.4 Figure 4-2 provides a slightly refined illustration of a subset of the information presented above. Figure 4-2 is limited to the total volume of international passengers, exclusive of those international passengers in the Canada-U.S. transborder market.[33] This better illustrates the relationship between the number of catering firms on site at airports and the number of long-haul and ultra-long haul passengers for whom catering is a more critical element. As before, YVR's position relative to these other airports is shown in red.

[33] The exclusion of transborder passengers is to focus on long haul flights. Transborder flights are short to medium haul and typically have simpler catering services similar to domestic flights.

Figure 4-2
Airline Catering Firms vs. non-transborder *International* Passengers
at Canadian & Select U.S. Airports
2014



Source: 2014 International Passenger Traffic (No Transborder): Diio, US DOT T-100 Data; Statistics Canada Air Carrier Traffic at Canadian Airports, 2014 & airport site statistics. Number of catering firms obtained from Inter*VISTAS* survey of airports. The data used for this figure is shown in Appendix F.[34]

4.4.5 Similar to the previous figure, while there are a few airports of comparable or smaller size with three caterers, the majority of airports with more caterers than YVR have significantly higher numbers of international passengers. There are also a few airports larger than YVR that only have two caterers. Again, the position of YVR relative to its peers suggests YVR is not an anomaly with too few or too many caterers.

4.4.6 The chart notes that subsequent to the 2015 survey,[35] Toronto (YYZ) now has four caterers. In

[34] Note that in my original graph (above), I intended that the YVR marker be red to match its text. I have corrected this in Appendix J but left the original graph here.

[35] The survey of airports was conducted in 2015 but used traffic data for 2014, which was the most recent data available at the time.

terms of international traffic, Toronto is actually quite a bit larger than Chicago (ORD), which was the only airport with four caterers.

4.4.7 I offer a few other observations:

- The same catering companies often appear at various airports. This is consistent with the trend towards industry consolidation discussed below, with airports being served by large national/multinational caterers rather than by unique local operators.
- There likely are economies to carriers of having a contract with a single caterer for multiple stations. This not only simplifies contract administration, it has the added benefit of better ensuring consistency of service, in keeping with the airline brand. there is also greater negotiating power for this airline when it comes to negotiating price and service quality with the in-flight caterers.
- Prior to 2014 there was a reduction in the number of caters at YVR (from 3 to 2), an experience of some others airports globally, not only within Canada or Vancouver.

4.4.8 It should be noted that this analysis has not been updated to 2016,[36] and thus there may be some changes in the results for some airports. For example, Toronto's Pearson International now has four in-flight catering companies and Edmonton now has only two.

Consolidation: From the emergence of the industry until the 1970s, airlines operated their own catering facilities as part of the airline's operations. However, over time almost all airlines in North America have exited this market.

4.4.9 A number of factors have led to airlines exiting this industry sector, including investment requirements (airlines prefer to invest in aircraft and the amount of investment in catering is not insubstantial), the higher pay scales of unionized airline employees, and the scale economies of catering operations. This encouraged them to spin off catering operations. In turn, many of these carrier catering operations were merged into larger catering operations.

4.4.10 Figure 4-3 demonstrated the degree of consolidation that has occurred in the industry since 1996.[37] In total, the number of firms in the chart has declined as a result of mergers and acquisitions from 27 to 11.[38] Over the same period, the volume of passenger traffic worldwide has increased from fewer

---

[36] The only updates I have are for Edmonton and Toronto, which information came from the VAA "Flight Kitchen Market Analysis Report", undated.

[37] Sources: LSG and Sky Chefs http://www.lsgskychefs.com/us/milestones/; LSG and Sky Chefs merge 2001; Gate Gourmet: http://www.reuters.com/article/uk-airlines-catering-idUSLNE85P01H20120626; Gate gourmet bought by Texas Pacific Group in 2002http://www.gategourmet.com/about; http://www.gategroup.com/about/about/our-evolution; SATS https://www.sats.com.sg/AboutUs/ourjourney/ourmilestones/Pages/history.aspx; Newrest http://www.newrest.eu/en/who-we-are/our-history/; Dnata; http://www.dnata.com/english/about-dnata/overview/; Chelsea Food Services https://en.wikipedia.org/wiki/Chelsea_Food_Services; Do & Co History http://www.doco.com/en/ir/the-company/history-of-do-co; Cathay Catering http://www.cpcs.com.hk/eng/history_e.html.

There is also a joint venture company between CPCS and LSG SkyChefs, called "CLS Catering Services". They operate at YVR and YYZ. The LSG Group website states the JV was formed in 1980 (Bloomberg says 1984), with LSG increasing its shares from 40% to 70% in 2008.

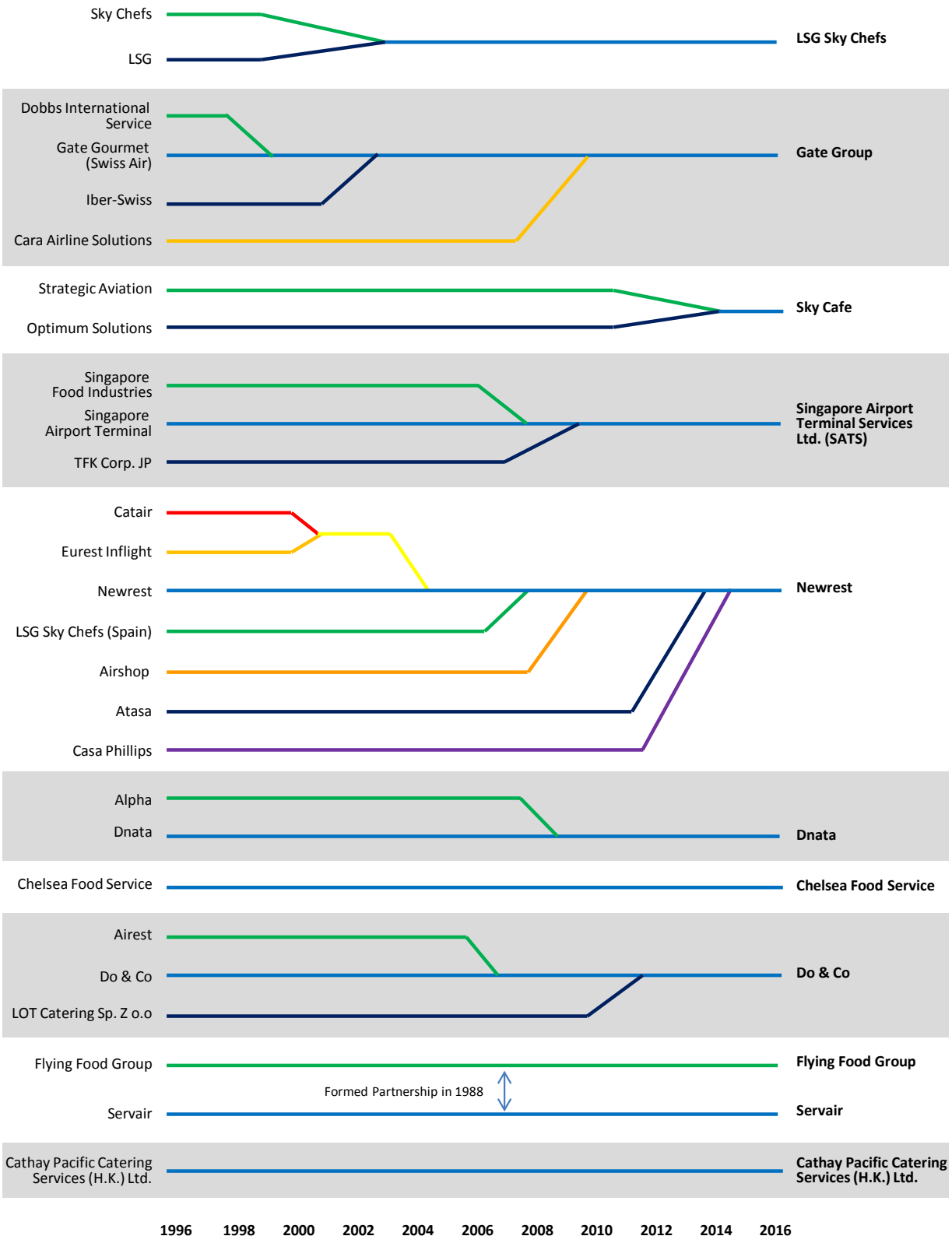
http://www.lsgskychefs.com/media/news/lsg-sky-chefs-acquires-cls-catering-services-canada/

[38] Skychefs is shown as having had no consolidation during the 199602016 period, but I note that it was the result of mergers in 1974 and 1992.

than 1.4 billion to almost 3.7 billion.[39]

[39] Source: International Civil Aviation Organization, Civil Aviation Statistics of the World and ICAO staff estimates obtained from https://data.worldbank.org/indicator/IS.AIR.PSGR.

Figure 4-3: Consolidation in the airline catering business



Source: InterVISTAS analysis

4.4.11 Consolidation is a consequence of the long-term decline in the magnitude of catering, whether measured in total or a per passenger dollars, as well the presence of economies of scale and scope in airline catering.

Update on the number of catering firms at Canadian airports

Counsel asked me to resurvey the Canadian airports with more than 1 Million passengers that I had included in my previous statement as to whether there have been changes in the number of catering firms since my previous survey in 2014. Appendix K provides updates of Figures 4-2 and 4-4.[40],[41] My findings are:

- Two airports have had a change since my original statement. Calgary and Montreal now each have 4 caterers operating.
- Two airports I had previously noted in my January 2018 Statement had changes in the number of caterers between 2014 and 2016. Edmonton fell from 3 to 2, and Toronto increased from 3 to 4.[42] Neither of these airports had further changes in 2017 or 2018 to date.

4.5 Volatility in the returns to catering firms

4.5.1 I note the volatility of returns in the catering sector of the commercial aviation industry. In a previously cited study, IATA has documented the volatility of returns on invested capital (ROIC) earned by caterers.[43] Figure 6-1 reproduces a diagram from an IATA report that shows this high ROIC volatility for caterers, volatility that exceeds even that of airlines. The volatility of ROIC for the catering sector is about a third higher than that for the airlines and more than double that of all other commercial aviation sectors. Seven of 11 sectors have average returns exceeding that in catering.

4.5.2 The catering industry in 2014 had low returns relative to most other sectors in the aviation value chain, and had the highest volatility.

[40] The two updated figures have not updated the traffic levels of the US and Canadian airport, which are graphed at their 2014 levels. Most airports have experienced traffic growth in this period. I also corrected an error in Figure 4-4 where the red diamond marker intended to highly YVR was mistakenly coloured for a different airport.

[41] I note that my research had two sources: internet research on catering firms and their locations of operations, and direct contact to the Canadian airports, generally through their CEOs or CFOs. As I prepare this statement, there were no direct responses from Montreal and St. John's airports, although internet research indicated no change in the number of caterers at St. Johns and the entry of an additional caterer at Montreal.

[42] I note that Toronto lists only two caterers in its most recent master plan compared with 4 in my survey. Two caterers operate on YYZ land leased from the Greater Toronto Airport Authority, one operates off site operators and one operates from a facility where it is a subtenant.

[43] IATA Value Chain Profitability, op cit, p. 22. Underlying report was prepared by McKinsey and Company.

Figure 4-4
Average Return on Invested Capital
By Sector of Commercial Aviation
2014

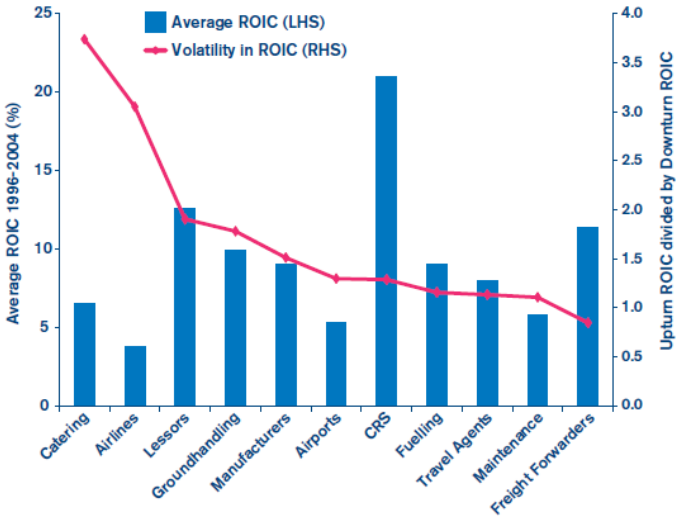


Figure 5.5: The Ratio of Average "upturn" ROIC to Average "downturn" ROIC

Source: IATA Value Chain Profitability.

5.0 Incentives of Airport Authorities, in Particular VAA, both Generally and Regarding In-flight Catering Specifically

5.1 Incentives of Not-for-Profit Airports

5.1.1 To achieve the primary object of facilitating the economic development of their communities, not-for-profit airport authorities focus primarily on the development of connectivity of their communities to their region, the nation and the world. This is apparent from an investigation of the annual reports and letters patent of Canadian airport authorities. In forming my opinion on this matter I note that I have directly worked with perhaps 100 airports globally, of which over half are not-for-profit organizations (or governments). My observation is that all not-for-profit airport operators in general, and those in Canada in particular, have their keen corporate focus on development of connectivity for their communities via an expanding array of air services provided by airlines. Attracting airlines to provide routes and capacity is job number one for airport companies. To be successful at this, airports must provide a range of services to the airlines. This range will include factors such as runways which can accommodate an airline's specific aircraft types, terminals with sufficient capacity and range of services, the availability and a choice of ground handling services, the availability and a choice of airline catering, the availability of a number of freight forwarders who can market and serve air cargo customers, etc.

5.1.2 While the primary general interest of not-for-profit airport authorities is on improving regional social and economic connectivity with the largest possible range and capacity of routes and flights, therefore, their specific interest with respect to catering is as a service required by airlines to operate flights. Airlines need catering that meets their needs for high dispatch reliability, consistency in food quality and adherence to regulations. Airlines prefer to have a choice of at least 2 caterers, just as they do for ground service providers, fuelling, etc. Catering operations that are subject to inconsistency and disruption are an obstacle to achieving the airport authorities' primary objective of the highest possible connectivity for their regions.

5.1.3 This is of particular importance at major hub and intercontinental gateways such as YVR where long haul flights requiring fresh catering for multiple meals are operated. The availability of high reliability, high quality, regulatory compliant fresh catering at an airport that has long haul intercontinental flights is essential. It is especially important for an airport where intercontinental distances are such that airlines will serve two or more meals. For such flights, airlines attach very high importance on caterer ability to provide a) fresh meals, and b) a customized range of fresh meals to allow the airline to serve its customers with special need diets or religious requirements and an airline branded meal experience.

5.2 Why Canada has Not-For-Profit Airport Authorities

5.2.1 For its 26 largest airports, Canada's policy has been to have these operated by not-for-profit private companies. They are called authorities but they are constituted as private companies.[44]

[44] There are three exceptions. The Kelowna airport had been leased to the City of Kelowna on a long term basis and was not converted to an authority governance model. Alberta established legislation to allow interested parties in Calgary and Edmonton to constitute themselves as authorities rather than use the Canada Corporations Act as was done in the other

5.2.2 This is in contrast to the U.S., which also utilizes not-for-profit authorities, which have governance models that have differences from the Canadian airport authorities, such as elected boards of directors, board meetings are held in public except for very special issues, and in many cases the authorities have powers to levy taxes on property in the general community.

5.2.3 The development of a new Canadian policy for airport governance began in the mid-1980s, when Don Mazenkowski was Minister of Transport. He sought a policy which would enable airports to grow and invest to better serve their communities, something that was not happening under budget-constrained Transport Canada operation. His goal was also to encourage airports to market themselves to attract new air services and improve economic and social connectivity for their communities, something that Transport Canada was reticent to do.

5.2.4 The first initiative was to convene an airports task force under the leadership of Assistant Deputy Minster Janet Smith. This resulted in a review of a range of governance options for airports.

5.2.5 At the time the only for-profit airports were the recently privatized UK airports. The evidence from the UK experience was almost non-existent as the policy had only just been implemented. The task force viewed it as a risky model for Canada to adopt. The primary alternative were the city and authority run airports in the U.S. (with the latter having characteristics of government operation). This was also not recommended for use by Canada as merely transferring airports from one level of government to another was not going to address either the investment financing issue, or the issue of improving customer service and efficiency.

5.2.6 As a result, for purposes of assuring stability and continuity of airport operations, the task force recommended that Canada move to community-based (but not city run) not-for-profit airport authorities. The consequences of disruption of airport operations profoundly influenced the government's views on airport transfers. Thus it was decided to lease rather than sell airport lands to the new airport authorities so that in the case of an authority's financial failure, the government as landlord could step in immediately and keep the system running. The policy also required the new airport authorities to assume all existing leases and concessions agreements for the entire lives remaining. I observed that there was also continuity of personnel and policies within the airports. Just as Transport Canada sought stability in land leasing and concessions, the new authorities generally continued with such policies, not only for catering firms but also for fuelling, ground handling, limousine licences, etc. The legacy of managing airport access for stability, reliability and financial viability was fully transferred to the new airport authorities.

5.2.7 The government adopted this policy and began negotiations with self-started groups in Vancouver and three other cities. In the mid-1990s the new government decided to continue with the private sector not-for-profit governance model and to compel all airports in Canada to be transferred.[45]

5.3 VAA and the Objects in its Letters Patent

5.3.1 VAA was created as a not-for-profit company under the *Canada Not-for-profit Corporations Act*.[46]

communities with large airports. However, the characteristics of the two Alberta airports are almost identical to those of the others.

[45] I note that I was a consultant to the Smith task force, and then was a member of the Ministers Airport Transfer Task Force with developed the final governing principles for airport authorities and reviewed and approved the first four airport transfers.

[46] Its 2016 annual report states: "The Vancouver Airport Authority [the "Airport Authority"] is incorporated under the Canada Not-for-profit Corporations Act."

5.3.2 As a not-for-profit company, it would be incorrect to characterize VAA as a profit maximizing firm. A not-for-profit company instead has its objects (or objective function as economists would characterize it) specified in its constating documents.

5.3.3 In this case, I understand VAA's objectives are set out in the Authority's Articles of Continuance, which set out a "Statement of Purposes of the Corporation":[47]

> "(a) to acquire all of, or an interest in, the property comprising the Vancouver International Airport to undertake the management and operation of the Vancouver International Airport in a safe and efficient manner for the general benefit of the public;
>
> (b) to undertake the development of the lands of the Vancouver International Airport for uses compatible with air transportation; and
>
> (c) to generate, suggest and participate in economic development projects and undertakings which are intended to expand British Columbia's transportation facilities, or contribute to British Columbia's economy, or assist in the movement of people and goods between Canada and the rest of the world."

5.3.4 Inferences based on neo-classical models of profit-maximizing firms are not appropriate for analyzing VAA's actions. Unfortunately much of the economics literature on antitrust/competition economics is based on a profit maximization assumption for the firm being scrutinized. Even if VAA were to be considered to be a monopoly in a particular market that does not imply that it necessarily behaves as a profit-maximizing monopolist. For not-for-profit companies like VAA, market structure does not imply a particular type of conduct, hence market performance.

5.3.5 Instead, we must look at what VAA perceives as its objective(s). Two main observations can be made.

5.3.6 First, the primary economic object of VAA is to manage and operate the property of YVR for the economic development benefit of British Columbia and to facilitate the movement of people and goods from Canada more broadly to the rest of the world.

5.3.7 I note that I have reviewed the objects of many of the National Airport System airports,[48] and find that a general economic development object/purpose governs all the NAS airports.[49]

5.3.8 My second observation is that the object with respect to development of YVR lands is for uses compatible with airport activities. Land development is secondary to the development of air transportation connectivity.

5.3.9 It is my view that profit maximization is not the economic objective function of VAA. Further, based on 25 years of experience as an academic, airport manager and airport consultant, I do not observe profit maximizing behavior by Canada's NAS airport authorities in general and at VAA in

---

[47] The Statement of Purposes of the Corporation in the Authority's Articles of Continuance is essentially the same as the objects in its original letters patent. My understanding is that the Authority was continued due to a change in legislation regarding not-for-profit corporations.

[48] The Minister of Transport in 1994 defined the 26 major and capital city airports as comprising the National Airport System (NAS). With one exception, these all use a not-for-profit governance model with economic development for the broader community as the operative object. The exception is for Kelowna airport, which had previously been leased to the City of Kelowna on a long term contract, and thus this airport is city run.

[49] With the exception of Kelowna, although as a government and not privately operated airport its behaviour is similar to the other airports.

particular. This is in contrast with my observations at a large number of for-profit private equity financed airports around the world.

5.4 It is air service connectivity that fulfills VAA's mandate

5.4.1 The mandate of VAA is not profit maximization, it is to manage and operate the assets of YVR for the economic development benefit of the broader community. This is also true for the 24 airport authorities operating Canada's 26 NAS airports.[50]

5.4.2 To fulfill this mandate, airports focus on providing air transport connectivity. This is reflected in the VAA 2016 Annual and Sustainability Report, where following the messages from the board chair and CEO, the main text of the Report begins:

> "Every day, YVR connects people and products from all over the world."[51]

5.4.3 In its 2016 highlights it lists as its first key objective:

> "Create a connecting hub between Asia and the Americas".[52]

5.4.4 A whole section of the report is devoted to "our business" and documents YVR's air services, including air carriers serving the community, routes to/from YVR, and documenting new routes and air services.[53] In the 2016 report, it notes 18 new routes in 2016 and a further 8 announced for new service in 2017. This air service connectivity focus is not merely on Vancouver to the world, but includes the connectivity of 31 British Columbia communities through YVR to the rest of Canada, the U.S. and the rest of the world.

5.4.5 This focus on reporting air service connectivity is found in every VAA annual report since its inception. For example, in VAA's first annual report, its then CEO (the Honorable David Emerson) states:

> "Our mission includes better service and better connections for communities beyond the lower mainland. Travellers from all parts of B.C. and Canada depend on YVR, and we recognize and embrace responsibilities to this broader community."[54]

Again, the report has a section focusing on airport marketing (p. 10) and a list of "YVR Connections to the World" (back cover).[55]

5.4.6 Looking beyond VAA, the role of air service connectivity as the key driver for national and regional economies has long been emphasised by IATA. E.g., a 2007 report titled "Aviation Economic Benefits," analyses the effect of aviation on national economies using a national air service connectivity index.[56]

---

[50] There are 26 NAS airports, two are operated by one authority (Aéroports de Montréal), and one is operated by a City (Kelowna).

[51] VAA 2016 Annual and Sustainability Report, p. 12.

[52] Ibid., p.10

[53] Ibid, pp. 46-61.

[54] Vancouver International Airport Authority, Annual Report 1992, see p. 4.

[55] This is actually a list of air carriers serving YVR. Beginning with the 1995 Annual Report, the list of destinations complements the list of carriers.

[56] IATA, "Aviation Economic Benefits", IATA Economics Briefing No. 8. July 2007. This report is based on an underlying technical study titled "Measuring the Economic Rate of Return on Investment in Aviation" December 2006, prepared by InterVISTAS

5.5 Growth of long haul and ultra-long haul

5.5.1 In the 25 years since the creation of VAA and its assumption of responsibility to develop and manage the assets of the airport for the economic benefit of the community, the two most remarkable developments of air service connectivity have been the growth of transborder services to U.S. destinations, and the growth of long haul and ultra long haul services.

5.5.2 The growth of transborder destinations was enabled by a regulatory change which removed restrictions on airlines in terms of cross border city pairs that could be served. This witnessed an initial "catch up" burst of transborder services beginning in 1995, and more modest growth since.

5.5.3 The growth in long haul has been strong and continuous. For example, in its 1992 annual report, YVR notes it had 11 carriers and these were serving 10 long haul overseas destinations. By 2016, that had increased to 23 Asian/Oceania destinations and another 11 long haul destinations in Europe for a total of 34 long haul destinations. Some of these are ultra long haul services such as those to Australia, New Delhi and Kunming. The number of intercontinental carriers has increased to 25.

5.5.4 The strong and sustained growth in intercontinental services is driven by several factors, including: the success of marketing by VAA including low aeronautical charges, new ultra long haul aircraft, a new low operating cost family of long haul aircraft, and liberalised air service treaties.

5.5.5 Since 1992, overall passenger traffic at YVR has grown by 5.2% per annum for a total 24-year growth of 124%. The fastest growing sector has been 'other international' which is dominated by long haul flights, which grew a total of just under 200% (199.4%), or 8.3% per annum.[57]

5.5.6 All of these long haul destinations require multi-meal fresh catering.

5.5.7 YVR's geographic location is such that most of its intercontinental flights (to Europe, Asia, and Oceania/Australia/New Zealand) are of such long duration that airlines will serve two or more meals. While a flight from New York to London (roughly 6 hours) is short enough that a single meal may suffice (and for a few carriers, perhaps commissary catering is sufficient); for a flight from Vancouver (9 hours) an airline will generally serve 2 or 3 meals.[58]

5.5.8 The shortest current intercontinental route from YVR is to Dublin at roughly 8:45 hours, and the shortest Asian route is to Tokyo Narita at roughly 9:15.

5.5.9 As I have already stated, the longer distance of YVR's intercontinental routes, a characteristic shared by most North American west coast airport means that:

- Airlines will generally (if not always) use fresh, rather than commissary catering.
- Airlines will serve multiple meals.
- And due to the latter, the airlines will try to avoid double catering from the origin station. This is partly due to food freshness for the return segment of long haul flights of 10-15 hours plus

Consulting. In the latter report we use an air service connectivity index previously developed by IATA. We used that index for the 2007 study, both by choice of InterVISTAS and by request of IATA.

[57] Source: YVR Traffic Updates, December 1992 and December 2016. 10.4% of Other International includes service to Mexico and the Caribbean, with the balancing of roughly 90% comprising long haul intercontinental service.

[58] E.g., flights that depart Vancouver in the early evening will serve an evening meal just after departure and breakfast prior to arrival. In between a light snack is often served. All three of these are usually fresh catered, even the snack, which may consist of a sandwich, a heated wrap or pizza, or tea service (scones, clotted cream, jam).

turnaround time, and space limits on board the aircraft for the 4-6 meals for a round trip for the meal service plus the associated refuse.

5.5.10 Based on the growth in passengers of the longer haul markets, the types of flights the VAA is attracting are flights where catering of fresh meals is important to the airline, even though in-flight catering operations had been struggling at YVR.

5.6 How YVR competes with other locations for new routes

5.6.1 I note that from 1996 to 2001 I was responsible for marketing of routes to/from YVR.

5.6.2 I have been responsible for InterVISTAS' air service development (ASD) practice for a number of years. ASD involves marketing to airlines on behalf of an airport, for seeking development of new routes, additional capacity and frequency on existing routes, higher quality service (such as converting a turboprop service to a regional jet), better convenience (such as from retiming of flights) and additional competition on existing routes. I have undertaken direct marketing for perhaps 20 airports, and supervised marketing managers for perhaps another 50. Corporate wide, InterVISTAS has provided airport marketing services to over 100 airports around the world. These include some of the largest airports in the world (e.g., Houston, Washington Dulles, London Heathrow, Taipei); medium sized airports such as Winnipeg and Wellington New Zealand; and small airports such as Gander, Coventry and Kilimanjaro.

5.6.3 Air service development consists of presenting business cases to airlines for new or revised services, designing incentives where appropriate, and addressing key requirements of the airlines. The business cases focus to a large extent on market sizes, passenger loyalty to carriers and/or carrier alliances, and other factors that affect the share of the passenger market the target airline could achieve. The marketing effort also includes incentives that the airport operator can offer.

5.6.4 When marketing to airlines that will be offering intercontinental service, a key factor involves the services that the airline will require at the airport that are not controlled by the airport operator. Fuel price and delivery reliability is generally the single most important of these factors. The availability of other critical services are also important, including airside servicing of the aircraft, customer service staff outsourcing, catering, and access to a frequent flyer lounge for its preferred customers. The first priority is whether such services are available, as a number of airports may not have these, especially smaller airports that are obtaining their first long haul services.

5.6.5 Specifically with regard to catering, my experience is that the airline wants to know if there is fresh catering available and if there is more than one competitor for catering services. More than one competitor for catering services could, for example, provide an airline with more options for personalised or branded service. Having a second caterer changes the competitive pricing dynamics of catering for the airlines. There is a preference for globally branded caterers known for their ability to delivery consistent and reliable service and a wide range of meal choices. As well, the air carrier already has contractual relationships with one or more globally branded caterers, facilitating start-up of the route.

5.6.6 For continental air services, my experience and that of my firm is that catering availability and choice is almost never an issue raised by airlines or by airport marketing presentations. While catering can be an absolute requirement for a long haul service, it is typically not a 'make or break' issue for a continental service due to the ability to engage in double-catering or self-catering.

5.6.7 Specifically regarding YVR, the airport competes with a number of other airports.

5.6.8 Two regional airports, Abbotsford and Bellingham, compete with YVR, but largely for regional and

sunspot destinations served by low cost and ultra low cost carriers. These markets are characterized by high air fare elasticity and relatively low importance placed by the traveller on catering and other services.

5.6.9 YVR competes to some extent with airports in the broader Pacific Northwest region, primarily Seattle. A carrier that is expanding into North America will typically seek at first to deploy a flight to one airport in a broad region, and use ground transport and short haul connecting flights to access other cities in the region. Cathay Pacific is an example. For over 35 years the carrier has operated a number of daily flights from Hong Kong to Vancouver but has not moved one of those flights to Seattle.[59] At Seattle, one finds airlines (especially carriers with limited fleets) such as Hainan, Aer Lingus, Asiana, Emirates, Norwegian and Volaris, but none of these serve YVR.[60] Yet all of these carriers advertise in the Vancouver market to attract passengers by auto or bus, or they offer connecting flights from YVR to Seattle then onward carriage to the overseas destination. One airline, SAS, which has a limited long haul fleet, operated for years at Seattle but never from YVR. The carrier had successfully developed diversion traffic from Vancouver to its Seattle flight.[61]

5.6.10 YVR's competition is also much broader than merely Seattle. It competes with a number of hub airports in Canada, the U.S. and even overseas. For example, after the 2000 merger of Canadian into Air Canada, the consolidated carrier began to downsize its operation to Asia from Vancouver, building an increasing number of Asia flights from Toronto. The competition was not for the Vancouver originating passenger, but rather for passengers originating in Toronto, and passengers originating in points such as Montreal and Ottawa who in the past had flown nonstop to YVR then onward to Asia but were guided by Air Canada's scheduling, capacity and pricing to switch to connections in Toronto to overseas points. This hub competition profoundly affected YVR's traffic, both on domestic legs and on the intercontinental legs. Similarly YVR competes with San Francisco and other hub airports for connecting passengers to overseas and U.S. destinations. It also competes with airports such as Tokyo for connecting passengers to other points in Asia (e.g., YVR to Guangzhou versus YVR-Tokyo-Guangzhou).

5.7 Considerations Associated with Granting Access to In-flight Caterers at YVR

5.7.1 Airports are unique operating environments relative to many other business sectors due to operational, safety, and security requirements. This is especially true of large airports where commercial airlines operate.

5.7.2 As discussed above, YVR is located on an island that forms a natural limit to the land for the airport. Access to the Island is constrained to only four bridges,[62] and these act as congestion points for

---

[59] There are no regulatory barriers to Cathay Pacific serving Seattle.

[60] In some cases, such as Emirates, there are regulatory barriers to prevent serving YVR. In others, such as Aer Lingus, there are no such barriers.

[61] As SAS joined the Star Alliance and the antitrust immunized "Atlantic ++" joint venture alliance, it found it more profitable to serve passengers to Copenhagen and beyond on alliance partner United Airlines flights from Seattle to Chicago to Copenhagen. It shares revenues from United for these passengers. From Vancouver, SAS can provide service from YVR to Toronto then on to Copenhagen, again sharing revenue. SAS can also utilize AC flights from YVR to London connecting to Copenhagen, but generally pricing encourages passengers to utilize the Toronto connection. In spite of the more favourable great circle routing from YVR to Copenhagen via London, the Atlantic ++ flight via Toronto has a very similar total trip time.

[62] One bridge consists of two separate spans, with the outbound span consisting of a low level swing bridge. The halt of traffic for the swing bridge to open for marine traffic takes a number of minutes, during which traffic backs up on Sea Island, so delays extend beyond the period in which the bridge is actually closed to traffic. Bridge closures are not predictable (as they are at

vehicles wishing to access the airport. During peak periods, bridge congestion can be severe. Trips onto and through the island that in free flowing conditions may require only 5 minutes, can take an hour or longer during peak times and/or when road capacity is interrupted. The level of congestion is highly variable with unpredictable events such as an accident on a bridge (or an approach), or the blockage of traffic due to the swing bridge operating for marine traffic.

5.7.3 Aviation safety requires training, licencing and adherence to regulations. Aviation safety is also related to operational issues. Vehicle access to the airside where aircraft are parked is governed by regulations and procedures. Each driver entering the airside areas of the airport must be licenced and this requires understanding airside vehicle operating procedures and successfully passing an exam. Catering vehicles traverse areas where aircraft, as well as numerous other operational vehicles servicing aircraft and the airport, operate.[63]

5.7.4 Another unique aspect of the airport operating environment is the need to maintain aviation security. For obvious reasons, airport properties require extraordinary security to prevent incursion from those who might want to cause harm or damage to airline operations and their passengers and cargos. As a result, all companies and organizations making use of scarce airport lands, whether public or private must be licensed by the airport operator to do business on airport property. Access "through the fence" to the airside by vehicles and employees is strictly controlled, both in terms of vetting individuals and companies, and physically every time a vehicle drives through the fence.

5.8 Land scarcity at YVR

5.8.1 One key aspect of many airports, including YVR, is land scarcity.

5.8.2 In many cases, airport lands were assembled in an era when aircraft requirements for runway length and passenger traffic requirements for terminal space were much smaller than at present. Airports located outside the developed urban area, such as Edmonton and Calgary, have ample land for their needs now and for the medium term. That is not the case for airports developed inside urban areas. This is the case for YVR. It is land constrained and unlikely to be able to increase its land area.

5.8.3 First, I note that the land area of YVR in the 1980s was inadequate for adding a parallel runway, the lack of which was becoming a major obstacle to development of air services by the late 1980s and into the 1990s. At that time, most of the remaining land on Sea Island was acquired by Transport Canada (and subsequently leased to VAA) to accommodate the runway and some land development on the North side of that runway. However much of the land was placed into a permanent environmental reserve that was required by the federal environmental review panel. The panel ultimately authorized the construction and limited operation of that runway,[64] but that authorization was conditional on creating the environmental reserve which is not available for future airport use. This is reflected in the YVR master plan. The most recent plan is for 2017-2037, and there is no change of use for the agricultural land reserve. Further in VAA's 40 year visioning exercise that was part of the master planning exercise no airport use of these lands is considered for the indefinite future.

---

the discretion of marine operators and the port authority) and are concentrated in the summer months, which happen to be the YVR peak air traffic period.

[63] These include vehicles for fuelling, watering, sanitary, aircraft maintenance and aircraft cleaning purposes. There are also vehicles for VIP transport, construction and maintenance, emergency response services, policing, etc.

[64] There are constraints on the use of the north parallel runway, including a curfew and limited ability to use the runway for take offs.

5.8.4 Second, the airport will likely need land south of the south parallel runway to construct a taxiway as traffic grows. This land will need to be converted from current uses such as general aviation and regional air service. These operators will either need to be moved to other lands with airside access to the runways and taxiways such as those in Airport Centre,[65] or alternatively, these airport operations on the south side will be displaced from YVR to another airport by higher land rents reflecting the scarcity of YVR land.

5.8.5 Third, beyond 2037, the master plan contemplates the need for an additional east-west parallel runway,[66] and this will become the priority land use of airport lands. The location of that runway is not determined, but land on Airport South or the remaining undeveloped lands on Airport North are primary candidates.

5.8.6 Fourth, further expanding the airport lands by creation of new land is unlikely, including by filling in waterways or tidal lands. Several decades ago, the federal government allowed some infilling of waterways to expand the airport,[67] but with today's environmental stewardship responsibilities and required federal environmental review, including a social cost – benefit analysis for any such development, it seems highly unlikely that the land of YVR will have any meaningful additions.

5.8.7 The one parcel of land that conceptually could be converted to airport lands is the community of Burkeville. The community is located adjacent to the Airport Centre lands where the caterers operator. Decades earlier there was a second community on the south side of Sea Island (Cora Brown), but to meet the needs of the airport the community was disbanded and the lands used for airport purposes. While this long ago event was a means at one time to increase airport land, it is not an option for the future. There is strong opposition to any thought of disbanding Burkeville and the YVR 2017-2037 master plan and longer run strategic planning exercise contemplates no such land acquisition and change of use.

5.8.8 The result is that YVR has limited land, limited or no ability to expand the land, plus future higher priority uses of lands currently in use for secondary (i.e., non-runway and non-terminal) purposes. YVR has land scarcity and this scarcity will only increase in the future. Airport lands that may seem available today are not able to be leased for medium to long term uses due to this scarcity except for high value uses.

5.8.9 Nevertheless, in order to provide key services required by airlines, and to allow those operations to achieve high service reliability, catering facilities are part of the long-run infrastructure of an airport and are allocated some second priority land access. This is also the case for other land uses such as for auto parking, policing, emergency response and airport operations. However, such land use must be carefully considered in terms of placement on Sea Island and in terms of the total amount of land allocated for long run use. Catering facilities, like other airport related land use for cargo, and maintenance, typically require long term leases in order to justify the investments that will be required.

5.8.10 To give the proper incentives for land use, land rents should reflect the scarcity of land.

5.8.11 At some other airports, such as Edmonton, there is a surplus of land in general and surplus of land that can be developed with airside access or have a near airside location. Thus there is little or no

---

[65] The caterers are located in Airport Centre.

[66] Because there is a scarcity of airside land in general, airports are required to have a Master Plan which establishes what each parcel of land is to be used for in the long-run, in order to optimize the use of these scarce lands. Land decisions must always be in the context of the long run Master Plan.

[67] E.g., Russ Baker Way was constructed by infilling a shallow channel in the middle arm of the Fraser River. This was done in an era prior to the Federal Environmental Review Act.

scarcity and assigning lands to multiple service firms is much less of a critical issue than it is for land scarce airports such as YVR.

5.8.12 I also note that catering facilities are specialized and generally lack an alternative use, at least at the value of the investments made in such facilities.

5.8.13 As there are other long term competing uses of scarce land at YVR beyond catering. VAA must make long-run decisions on the uses of these lands based on their objects, the prime one being development of air services to improve the community's air connectivity.

5.8.14 In addition, if the third caterer operates off airport, there would be no incremental land rent to VAA. If it located on airport, VAA would earn some additional revenue from land rent, although there are other potential users of this land in the long run and the net incremental land rent income to VAA may be small or zero.

5.9 Revenues VAA receives from In-flight Caterers at YVR

5.9.1 On site caterers at YVR pay VAA two fees:[68]

- A rent based on the area of land leased.[69]
- A concession or licence fee which is based on a percentage of gross sales.

5.9.2 VAA reserves the right to provide access to the airside to off-site caterers who enter into a licence agreement with VAA. These entities would pay only a licence fee.

5.9.3 Land rent.
I am advised the land rent paid by caterers to VAA is based on market rents, which reflects the scarcity I reference in Section 5.8. Those fees can be established by individual valuations in highest and best use, and/or by using rents paid on comparable nearby industrial properties.[70]

5.9.4 Concession/Licence Fee.
In addition to land rents paid by the in-flight caterers, these firms pay concession fees (referred to as "port fees"), which are based on a percentage of the gross revenues of the catering tenant, i.e., 5% for on-airport sales.[71]

5.9.5 The charging of a percentage fee on a concessionaire's revenues is a common practice in the airport industry for airport land tenants and concessionaires in the terminals. It is also similar to many fee formulas for other land access, such as rent paid by retailers to shopping centres, which may consist of a rent based on area occupied plus a percentage of gross revenues.[72]

5.9.6 The use of licence fees which are computed as a percentage of gross sales transfers some business risk over the business cycle to the airport, which may be better able to manage such risk (e.g., relative to a higher fixed annual licence fee with no participation by the airport operator in gross sales

---

[68] See, for example the two spate agreements between VAA and Operations Ltd. The *Land Lease* and the *Licence.*

[69] I am advised that the in-flight caterers at YVR also lease some industrial space from VAA's real estate limited partnership, Vancouver Airport Property Management LLP.

[70] Industrial land is generally scarce in Vancouver.

[71] In terminal concessionaires typically pay a much higher port fee.

[72] See, for example How Percentage Rent Works in a Commercial Real Estate Lease, January 16, 2014, Ben Grady, Property Metrics.

revenue) . In other words, the total supply chain risk can be lower with the airport bearing part of the business risk of the concessionaire, than with all business risk being borne by the tenant.

5.9.7 VAA receives a percent of gross revenue as a licence fee from both current caterers. As well, I am advised that concession fee provisions require VAA to charge all in-flight catering firms the same concession fee rate. Accordingly, VAA it is not incented to favor one caterer over the other.

5.9.8 VAA revenues from catering firms.
I am advised that the revenues VAA receives from caterers (rent and licence fees) comprised [redacted] million in 2013 (approximately [redacted]% of VAA's total revenues for 2013) and [redacted] million in 2016 (approximately [redacted]% of VAA's total revenues for 2016).

Update: For 2017, the figure is [redacted] million, still only [redacted]% of VAA's total revenue in 2017.[73]

5.9.9 Thus revenues from in-flight catering firms are of very minor importance to VAA.

5.9.10 To put the 2016 figure in context, I estimate that a single exemplar incremental long haul flight at YVR will bring to VAA roughly $2.4 million per annum in incremental revenues from the AIF,[74] landing/terminal fees, and auto parking revenues associated with that flight.[75] All of these fees are incremental, in that they all increase with the number of passengers and flights. If VAA's incremental revenues from terminal and other concessions are added,[76] this increases to $3.3 million.

5.9.11 Thus, the revenue from a single incremental long haul flight brings in [redacted]% of the revenue VAA earns from both of its independent caterers, including both their rent and licence fees.

Update: In 2017, the single incremental flight revenue constitutes [redacted]% of the revenue VAA earns from both of its independent caterers, including both their rent and licence fees.

5.9.12 Moreover, catering revenues earned by the airport are unlikely to materially change if another caterer were to enter the market, since revenues and hence licence fees paid can be expected to decline for the existing caterers. VAA's catering concession revenues are a percentage of catering gross revenues. So if these are merely spread over three rather than two caterers, VAA catering revenues might not change in a material way. As I already discussed, due to scarcity of land at YVR, whether a caterer is on site or off site may have little long run difference for VAA in terms of its income from land rents.

5.9.13 Even assuming the entry of another caterer would result in cost reductions to the airlines (a subject on which I have not been asked to express an opinion), such reductions would require an assumption that the third caterer would be economically viable at the scale needed to achieve these cost reductions. Should one of the incumbents exit the catering market,[77] the addition of a new entrant would perhaps result in limited or no net benefit, as the market structure would return to two suppliers. Further if the result is that YVR is left with only one fresh caterer and one commissary caterer, then the impact on

---

[73] Source is table provided by counsel, document [redacted]

[74] Airport Improvement Fees.

[75] Details of computation provided in Appendix F.

[76] Concession revenues are partly fixed (e.g., monthly minimums in concession agreements) and thus in the short run will not necessarily increase proportionately.

[77] E.g., because the market is not large enough to support more than two caterers.

catering costs paid by those airlines needing fresh catering would likely be undesirable.

5.9.14 Since the airport rent (including participation concession/licence fees) portion is a very small portion of the total price paid by airlines for catering services, and with the likely price inelasticity of airline demand for catering services, VAA is unlikely to influence the quantity of airline demand for catering services. This means that adding another caterer is unlikely to change the total quantity of catering services purchased by airlines. Therefore, any revenue gained by VAA from an additional caterer will likely be offset by a loss of revenue from the existing caterers. Of greater importance to the Authority is the ability to have at least two viable caterers that can provide the full range of services required by airlines, including competing suppliers of fresh catering services. This ability is critical in order to attract additional and new air services to YVR.

6.0 VAA Rationale for Declining to Issue Licenses to New Entrants in 2014s

6.1.1 I have been asked for my opinion of the rationale offered by VAA management for declining to issue licences to new entrant in-flight caterers at YVR in 2014 having regard to my answers to questions 1 through 3.

6.1.2 Survivability of flight caterers

I am advised that one aspect raised by VAA management in 2014 concerned the survivability of caterers, given the YVR experience of losing one of three caterers.

6.1.3 In Section 3.3 I observed that since 1990, there has been a decline in total catering spending in inflation adjusted terms in spite of a strong increase in total passenger traffic; and a dramatic 65% decline in airline real (inflation adjusted) spending on catering per passenger, as documented by data available from the U.S. Department of Transportation. Similar data specific to catering spending is not publicly available in Canada, but broad trends in airline expenses and customer service is similar in the two countries and it is my opinion that the same broad trend is present in Canada. Data from Air Canada and WestJet annual reports (which combine catering spending with other some expenses) confirms that catering is a very small share of airline expenses.

6.1.4 Airlines have dramatically reduced their need for catering for continental flights, with economy cabin flights typically focusing on a few standardized, typically non-fresh catering items that are generally but not exclusively prepackaged and standardized. These types of catering items are typically not airline speciality products but rather general national brands (e.g., Coke, Diamond brand almonds). Nevertheless for these simpler catering needs the airlines still have a need for reliability in aircraft servicing and strict adherence to international waste disposal for agriculture and disease protection. Because continental flights, with greatly reduced need for catering services, account for the largest portion of air traffic (roughly 75% of total passenger at YVR), the overall demand for catering services has been reduced substantially.

6.1.5 In Section 4.4 observed that in general the number of catering firms at any given airport is small. In a survey of 63 North American airports in 2014, only one airport (Chicago O'Hare Airport) had four on-site caterers, and only ten had three caterers. Of airports with departing passenger volumes the same or less than YVR, only three had three caterers, and one of these (Edmonton) now only has two caterers. All other airports of YVR size or smaller at that time (measured by departing passengers) had two or fewer caterers (with the exception of Edmonton, which in 2014 had three caterers and now only has two). If the comparison is made vis a vis only long haul international passenger volumes (i.e., excluding continental international passenger between Canada and the U.S.), only three airports smaller than YVR (in terms of long haul international passengers) had more than two caterers (Seattle, Orlando and Dallas), and each of these airports are more than twice the total size of YVR. No airport in the survey with intercontinental passenger volumes the same or less than YVR had more than two caterers (other than the temporary experience at Edmonton).

Update: Since my original statement, two Canadian airports, Calgary and Montreal, have joined Chicago O'Hare airport in having 4 caterers. (Toronto had joined Chicago O'Hare prior to my January 11 statement). Montreal has fewer total passengers than YVR but a greater number of long haul international passengers. Calgary's traffic in both dimensions is lower than that of YVR, and thus there is now one airport which is smaller than YVR in total passengers and with intercontinental passenger volumes less than YVR that has more than two caterers. The last sentence in the previous paragraph was meant to

read "No airport in the survey *smaller than YVR in terms of total passengers and* with intercontinental passenger volumes the same or less than YVR had more than two caterers (other than the temporary experience at Edmonton).Update: "That sentence should now read: *"Only one airport in the survey smaller than YVR in terms of total passengers and with intercontinental passenger volumes the same or less than YVR (Calgary) had more than two caterers (other than the temporary experience at Edmonton).*"

6.1.6 I note that the number of caterers at YVR fell from three to two. I also note that the number of caterers at Edmonton Airport there has also fallen three to two.

6.1.7 The 2013 gross revenues of catering firms at YVR had still not recovered to the former 2004 peak.

6.1.8 While not documented at the time, VAA could not have failed to observe that few airports of its size supported more than two catering operations.

6.1.9 VAA also appears to have observed the competition between the two catering firms that resulted in a transfer of business between fresh caterers and a consequent wage freeze agreed to by the employees of one of the caterers to support the ability of their employer to win sufficient business to remain viable.

6.1.10 Thus my opinion is that VAA's concern as to whether there was sufficient demand for in-flight catering at YVR to support entry of a third carrier and/or that such entry could put at risk the financial viability of the two incumbent carriers appears reasonable.

6.1.11 Precarious nature of in-flight catering business

I am advised that VAA management believed that the state of the in-flight catering market at YVR was precarious. The demand for in-flight catering had declined significantly over the preceding decade with many airlines eliminating fresh meal service for most passengers, and replacing them with "buy-on-board" offerings. That contributed to decline in revenues for in-flight catering services, even when passenger volumes increased. VAA management understood that in-flight caterers at YVR were increasingly relying on revenues from sales to customers that were off-site, such as Starbucks, which suggested that those caterers may be struggling to maintain their revenues from on-site customers at YVR (primarily airlines) due to decreased demand. In addition, VAA management understood that unionized employees at Gate Gourmet had recently agreed to a three-year wage freeze.

6.1.12 Again, in Section 3.3 I documented the declining demand for catering services. The decline in demand was found, whether measuring inflation adjusted total airline expenditures on catering, catering expenditure per passenger or catering as a percent of total airline cost.

6.1.13 In Section 4.5 I observed that there is industry wide basis for this concern in addition to YVR's past experience. There I noted the volatility of returns in the catering sector of the commercial aviation industry. In a previously cited study, IATA has documented the volatility of returns on invested capital (ROIC) earned by caterers. The volatility of ROIC for the catering sector is about a third higher than that for the airlines and more than double that of all other commercial aviation sectors. Seven of 11 sectors have average returns exceeding that in catering.

6.1.14 The catering industry in 2014 had low returns relative to most other sectors in the aviation value chain, and had the highest volatility.

6.1.15 Thus, my opinion is that the perception by VAA management that the catering market was in a precarious state and becoming reliant on off airport customers due to decreases in demand for in-flight catering appears reasonable.

6.1.16 Potential risk of significant disruption. [78]
I am also advised that in 2014, VAA management believed, based on the information available to it, that the entry of a third caterer would entail significant risk that one or both of the incumbent caterers would leave YVR, and that the consequences of an incumbent caterer leaving YVR would have been highly problematic and not in the best interests of the Airport. Among other things, it would have caused significant disruption in the availability of full-service catering for airlines. As a result, it would have made it more difficult for VAA to attract and retain airlines and routes to YVR.

6.1.17 In Section 5.3 I discussed the objects of VAA and observed that it is not a profit maximizing entity. Instead, its object is to support the economic development of the greater community. In Section 5.4 I observed that it is air service connectivity that fulfills VAA's economic development mandate. In Section 5.6 I discussed how VAA competes with other airports and the role of the availability of consistently reliable catering services in airport marketing. YVR competes with many other airports, especially hub airports for intercontinental traffic.

6.1.18 In Section 3.7 I discussed the consequence for airline services from disruption in the supply of fresh catering services at an airport. There would be significant impacts in terms of a) operational ability of carriers to serve meals, particularly on long haul intercontinental flights, b) their costs of catering and c) customer service impacts.

6.1.19 It is thus my opinion that VAA's concern with the risk and effects of disruption of catering services appears reasonable.

6.1.20 Departure of incumbent
In addition, VAA management was concerned that the departure of an incumbent caterer would jeopardize the existing competitive market for full-service in-flight catering at YVR. Specifically, if one of the full-service incumbents were displaced by a caterer that, for example, offered only non-perishable products, then that would leave only one supplier of fresh meals in the market. The result would be less competition and fewer choices for airlines.

6.1.21 In Section 3.2 I discussed the fragmentation of the airline business model that resulted in the dramatic reduction in catering demand by airlines for continental flights. In Section 3.4 I observed the growth of long haul and ultra long haul routes. For these flights, full service fresh catering is essential and a matter addressed in airport marketing.

6.1.22 It is thus my opinion that VAA's concern that it has at least two competing full-service in-flight catering choices available, especially for long haul air carriers but also for the catering needs of some continental flights, appears reasonable.

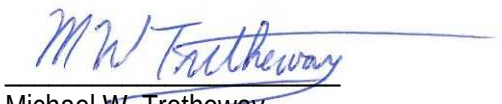
6.1.23 In conclusion, it is my opinion that the rationale offered by VAA management for its 2014 decision appears reasonable having regard to the history of in-flight catering services at YVR and the economics of downstream catering and further downstream airline services, and is consistent with my answers to questions 1 through 3.

[78] Update: Note that a formatting error in my original statement restarted numbers at 6.1.1 at this point. In this supplementary statement I have corrected this.

7.0 Signature

7.1.1 I am the person primarily responsible for the content of this statement. The above is my statement and opinion.

7.1.2 Appendix G has my signed Acknowledgement of Expert Witness.



Michael W. Tretheway
signed at Cross Plains Wisconsin USA
1 August 2018

Appendices

Appendix A: Professional Qualifications

Areas of Expertise

8.1.1 My area of expertise in this matter is in transportation economics.

8.1.2 I have specific expertise in:

- Airport economics, including airport pricing policies, airport competition, airport marketing, airport forecasting, risk management and financial planning, and airport strategic planning;
- Airline economics, covering both supply side (e.g., economies of scale) and demand side (e.g., consumer elasticities of demand). My expertise includes both passenger and freight air transport;
- Valuation of airports and airport operating companies;
- Airport management, including management via not-for-profit governance structures versus for-profit governance structures;
- Airport price and access regulation; and
- Empirical measurement in the transportation sector, including key economic dimensions such as the presence or not of various types of economies of scale, productivity in the transportation sectors, measurement of consumer demand elasticities, and empirical analysis of the effect of market structure on airfares.

8.1.3 Using these skills, I provide an expert opinion on the magnitude of the traffic loss at YMM associated with the 2016 Fort McMurray Wildfire, and the resultant revenue lost by the Fort McMurray Airport Authority.

Experience

8.1.4 I have provided expert witness statements in roughly 75 proceedings. These include court cases, tribunal hearings, regulatory hearings and arbitrations (commercial and arbitrations under the Canada Transportation Act). I have testified in Canada, the United States, New Zealand, Australia, Hong Kong, South Africa and before the European Commission.

8.1.5 Among others, I have provided expert witness statements on behalf of:

- Counsel for the Gander International Airport Authority before the Supreme Court of Newfoundland and Labour and before the Property Assessment review panel on the valuation of airport land;
- Counsel for the Sault Ste. Marie Airport Development Corporation, the operator of the Sault Ste. Marie Airport, before the Ontario Assessment Review Board on the valuation of airport land.
- Counsel for the Commonwealth of Australia on the valuation of Sydney Airports Corporation Ltd., and the degree to which such value reflects land assets versus values of other assets and intangibles;
- The (Canadian) Competition Bureau before the (Canadian) Competition Tribunal, the National Transportation Agency, the Superior Court of Quebec and the House Standing Committee on Transportation and Infrastructure;

- Qantas and British Airways before the Australian Trade Practices Commission;
- Qantas before the New Zealand Commerce Commission;
- Qantas and Air New Zealand before the New Zealand Commerce Commission, the Australia Competition and Consumer Commission, and the Australian Competition Tribunal;
- Lufthansa, SAS and United before the Commission of the European Union;
- Comair before the South African Air Services Licensing Board;
- T1T2LP (Terminal 1 – Terminal 2 Limited Partnership) before the Federal Court of Canada;
- The International Air Transport Association before the Australian Competition and Consumer Commission;
- The Association of American Railroads before the Interstate Commerce Commission;
- Rocky Mountaineer Rail Tours Ltd. before the Canada Transportation Act Review Panel;
- The British Columbia Tourism Coalition for Improved Air Services before Canada Transportation Act Review Panel;
- The Canadian Airports Council before the Canadian House of Commons Standing Committee on Finance;
- Hallcon Transportation Services before the British Columbia Motor Carrier Commission;
- WestJet Airlines before the Canada Transportation Commission;
- Canadian National to the Competition Bureau (Canada);
- Canadian Pacific Railway before various arbitrations under Section 160 of the Canada Transportation Act;
- Québec North Shore & Labrador Railway before arbitrator under Section 160 of the Canada Transportation Act;
- Hallcon Crew Transport before the B.C. Passenger Transportation Commission;
- The Vancouver International Airport Authority in the Supreme Court of British Columbia;
- The Toronto Port Authority, operator of the Billy Bishop Toronto City Airport before the Federal Court of Canada; and
- AUT Technologies before the Federal Court in the United States.

8.1.6 I have provided expert opinions specifically regarding damages in many similar cases. These included, among others:

8.1.7 I have testified for a Canadian air carrier (WestJet) before the Canadian Transportation Agency on regulatory issues involving carrier policy regarding access for individuals with transportation related disabilities. This testimony included estimating costs of various access policies.

8.1.8 I have provided expert statements for Air Canada and Air Transat before the Agency on potential damages to the carriers from the public release of safety reports that were problematic in their execution and adherence to regulations.

8.1.9 I have testified in several labour arbitrations on behalf of either carriers or labour organisations in disputes involving seniority integration or wages. My testimony in these cases generally involved issues of career expectations for various labour groups and/or short to medium term economic

conditions governing the segments of the airline industry involved in the disputes.

8.1.10 In addition to the above testimony, I have been engaged as a consultant on various confidential projects involve issues of impact on traffic and fares, market definition, entry barriers, poised competition, potential detriment and potential benefits, as well as econometric analysis of fare data. These engagements have been to carriers, airports, and competition (for other government) authorities in Canada, Europe, New Zealand, Hong Kong and Australia. These engagements included a number of hypothetical mergers, JVs or other agreements requiring competition authority approval. Some of these involve internally proposed conceptual transaction and some involved due diligence consideration of JVs/agreements that could be alternatives to JVs actually applied for.

8.1.11 In all my appearances as an expert witness in aviation or other matters on which I provided formal testimony, my credentials as an expert have never been rejected by the court, tribunal, arbitrator or regulatory agency.

Qualifications

8.1.12 My qualifications are based on my training as a professional economist, my forty year record of publications including peer reviewed journals, my 13.5 years research and teaching at the University of British Columbia (Division of Transportation and Logistics in the Faculty of Commerce and Business Administration) and my subsequent roughly 20 years as an Adjunct Professor with the University,[79] my experience working for and with airport operators around the world, my experience as a consultant to airlines, my experience working for competition and other government authorities and ministries, and my experience working with other stakeholders in the transportation sector.

8.1.13 A copy of my curriculum vitae follows.

8.1.14 I hold a Ph.D. in Economics from the University of Wisconsin (1981). My PhD Thesis was a study of the production structure of the airline industry, including measuring the productivity effects of airline deregulation and assessing whether returns to scale exist in the industry.

8.1.15 From 1983 to 1996 I was an Associate Professor in the Faculty of Commerce and Business Administration (now known as the Sauder School of Business) at the University of British Columbia. I have taught courses in air transportation management, managerial economics, business statistics, transportation economics, project evaluation, the role of transportation in the economy, government and business, and business logistics.

8.1.16 I am the author of over 40 scholarly papers and my research has been published in journals such as *The Rand Journal of Economics, The Review of Economics and Statistics, The Logistics and Transportation Review, Transportation, Transportation Research, The Journal of Transport Economics and Policy, The Journal of Air Transport Management, Annals of Aviation and Space Law, the Journal of Air Law and Commerce and the Transportation Practitioner's Journal.* I am the author of several books, including *Airline Economics, Airline Cost and Performance,* and *Airline Deregulation and Privatisation.*

8.1.17 In most years since 1 January 1997 I have held a position as Adjunct Professor of Transportation

[79] The Faculty of Commerce and Business Administration at the University of British Columbia is now known as the Sauder School of Business.

and Logistics in the Sauder School of Business at the University of British Columbia. Gaps in my appointment are due to lags in the reappointment process. Currently my appointment has lapsed but is being renewed.

8.1.18 I have been a member of the Board of Editors of the Quarterly Journal of Finance and Accounting,[80] the *Logistics and Transportation Review*, and the *Journal of Air Transport Management.*

8.1.19 In 1994, I served as a visiting fellow at the Australian Bureau of Transport and Communication Economics.

8.1.20 In addition to my duties at the University of British Columbia, I have taught at the Université Canadienne en France, Shanghai Jiao Tung University, Sian Jiao Tung University, Nankai University, and Istanbul Technical University.

8.1.21 From January 1994 to March 1997, I was Special Advisor to the President, Vancouver International Airport Authority. In this role I worked in a number of areas of the airport authority and its subsidiary company, which operates other airports in Canada and abroad.

8.1.22 From March 1997 to December 1998, I was Vice President of Marketing Services for YVR-VISTAS, a wholly owned subsidiary of the Vancouver International Airport Authority, which was later purchased by the employees of what is now Inter*VISTAS* Consulting Inc. In this role, I was responsible for the marketing of air cargo for the Vancouver International Airport.

8.1.23 Since January 1999, I have held various positions at the Vice President level of Inter*VISTAS* Consulting Inc.[81] I currently have the titles of Chief Economist, Chief Strategy Office (and thus a member of the *C-Suite* of the InterVISTAS Consulting Group, and Managing Director-Canada.

8.1.24 I have served as an advisor or consultant to government agencies, for example:

- The Canadian Transportation Agency;
- Transport Canada;
- The Minister of Transport (Canada); and
- The Canada Transportation Act Review Panel;[82]The U.S. Civil Aeronautics Board;
- The Competition Bureau (Canada);
- The Competition Authority (Ireland);
- The New Zealand Commerce Commission;
- The U.S. Surface Transportation Board,
- The Australian Bureau of Transport and Communications Economics;
- The Malaysian Aviation Commission;
- The Civil Aviation Administration of Singapore;

[80] Formerly, the *Quarterly Journal of .Business and Economics.*

[81] InterVISTAS Consulting Inc. and its related companies were sold to DHV and Delcan in October 2008. Subsequently Delcan sold its shares to DHV, and DHV merged with Royal Haskoning.

[82] This includes the review panels in the 1990s, 2000, and the most recent panel which tabled its report in 2016.

to labour organisations:

- The Air Line Pilots Association;
- Canadian Air Line Pilots Association;
- Association of Professional Flight Attendants;
- Wardair Pilots Association;
- Council of Canadian Airline Employees;
- The Canadian Union of Public Employees; and
- The Canadian Auto Workers.

To a consumer group:

- The Consumers Association of Canada.

To the following airlines, among others:

- Air Canada;
- Air China;
- Air France;
- Air New Zealand;
- American Airlines;
- British Airways;
- Canadian Airlines International Ltd.;
- Canadian Regional Airlines;
- Cathay Pacific Airlines;
- Comair (South Africa);
- COPA Airlines (Panama);
- Emirates Airlines;
- Hainan Airways;
- HMY Airways;
- KLM;
- Lufthansa;
- Pacific Western Airlines;
- Qantas;
- Scandinavian Airline System;
- United Airlines;
- Tiger Airways;
- Virgin Atlantic Airways; and

- Virgin Blue (Pacific Blue, Virgin Australia) Airlines;
- WestJet.

To the following aviation industry organisations:

- The Canadian Council for Aviation and Aerospace;
- The International Air Transport Association;
- Airports Council International (North America, Europe, World);
- SITA Inc.;[83]
- The National Business Aviation Association;
- The Canadian Business Aviation Association;
- The Helicopter Association of Canada;
- The Canadian Owners and Pilots Association;
- The Air Transport Association of Canada; and
- The Canadian Airports Council.

To roughly 70 airports, among which are:

- Auckland International Airport Corporation;
- Wellington International Airport Ltd.;
- Sydney Airport Corporation Ltd.;
- London Gatwick Airport;
- Singapore Airport;
- Hamburg Airport;
- The Bermuda International Airport;
- Malaysian Airports Berhad;
- Infraero;
- Aena;
- Drewitz Airport (Germany);
- Lamezia Terme International Airport (Italy);
- Las Vegas International Airport;
- Coventry Airport (West Midlands International Airport) UK;
- Spokane International Airport;
- Reno Airport;
- Las Vegas McCarran Airport;

[83] Société Internationale de Télécomunications Aéronautiques, which now does business simply as SITA.

- Greater Toronto Airport Authority;
- The Calgary Airport Authority;
- Edmonton Airports;
- Vancouver International Airport Authority;
- Aéroports de Montréal;
- Winnipeg International Airport Authority;
- Comox Valley Airport Commission;
- Muskoka Airport;
- Pitt Meadows Airport;
- Medicine Hat Airport;
- Comox Airport
- Gander International Airport Authority;
- Government of the Northwest Territories;
- Hamilton International Airport (TradePort International);
- Moncton Airport Authority;
- North Peace Airport Society;
- Regina Airport Authority; and
- The Prince George Airport Authority.

And to tourism organisations, including:

- The World Tourism Organisation;
- Council of Tourism Associations of British Columbia;
- Tourism British Columbia;
- Tourism Richmond;
- RockyMountaineer Rail Tours and affiliated companies;
- Blackcomb Ski Corporation;
- The B.C. Sports Hall of Fame and Museum;
- Tourism Nova Scotia;
- Tourism Saskatchewan;
- Ministry of Tourism Business, Development and Investment, Government of Alberta;
- Tourism Ontario;
- Puerto Rico Tourism Company;
- The Olympic Secretariat of B.C. Trade and Investment;
- The Council of Ministers Responsible for Tourism (Canada);

and to others.

Appendix B: Curriculum Vitae

MICHAEL WILLIAM TRETHEWAY

Updated January 2015

EDUCATION

a) Graduate
1981: University of Wisconsin-Madison, Ph.D. (Economics)
1978: University of Wisconsin-Madison, M.S. (Economics)
1976: University of Wisconsin-Milwaukee, M.A. (Economics)

b) PhD - Thesis Title
"Productivity Growth and Returns to Scale in the U.S. Trunk Airline Industry, 1972-1978"

c) Undergraduate

1974: University of Wisconsin-Milwaukee, B.A. (Economics)

PROFESSIONAL EMPLOYMENT RECORD

1999-present	Executive Vice President, Chief Economist & Chief Strategy Officer, Inter*VISTAS* Consulting Group.
1997-1998	Vice President, Marketing Services, Vancouver International Strategic Services Ltd., subsidiary of the Vancouver International Airport Authority
1997-2000	Faculty, International Aviation Management Training Institute
1997-present	Adjunct Professor, University of British Columbia, Faculty of Commerce and Business Administration
1994-1996	Special Advisor to the President, Vancouver International Airport Authority
1996-1998	Faculty Member, International Aviation Management Training Institute
1988-96	Associate Professor, Faculty of Commerce and Business Administration, University of British Columbia
1983-88:	Assistant Professor, Faculty of Commerce and Business Administration, University of British Columbia
1981-83:	Senior Economist, Laurits R. Christensen Associates, Inc., Research Associate, Department of Economics, University of Wisconsin
1978-81:	Research Associate, Laurits R. Christensen Associates, Inc.
1976-81:	Research Assistant, Economics, University of Wisconsin
1973-75:	Tutor, Department of Learning Skills, University of Wisconsin-Milwaukee

FELLOWSHIPS

1994	Visiting Fellow, Australian Bureau of Transport and Communications Economics
1994-95	Vancouver International Airport Authority, leave support

PROFESSIONAL MEMBERSHIPS

Various years

American Economics Association

Canadian Economics Association

Midwest Economics Association

Western Economics Association

National Association of Business Economists

Econometric Society

Canadian Transportation Research Forum

Transportation Research Forum

Transportation and Public Utilities Group, AEA

Association for Public Policy Analysis and Management

Air Transport Research Society

German Aviation Research Society

PROFESSIONAL PAPERS

A. Books and Monographs

1. *Airline Economics: Foundations for Strategy and Policy*, 1992, Centre for Transportation Studies, Vancouver.
2. *Productivity in the Canadian Lumber Industry: An Inter-regional Comparison*, Forestry Canada, Information Report 0-X-411, Great Lakes Forestry Centre, 1990 [with A. Ghebremichael and D.G. Roberts].
3. *Airline Deregulation, a special issue of the Logistics and Transportation Review*, editor and author of introduction, Volume 22 (4), December 1986.
4. *Identifying and Measuring the Impact of Government Ownership and Regulation on Airline Performance*, report submitted to Economic Council of Canada and Consumer and Corporate Affairs Canada, March 1985, revised October 1986, published as a refereed technical report by the Economic Council of Canada 1987 [with T.H. Oum and D.W. Gillen].
5. *The Growth and Performance of the Canadian Transcontinental Railways: 1956-1981*, Centre for Transportation Studies, University of British Columbia, Vancouver, 1987 [with K.D. Freeman, T.H. Oum and W.G. Waters II].
6. *Deregulation and Airline Employment: Myth Versus Fact. Centre for Transportation Studies*, University of British Columbia, Vancouver, 1986 [with R.J. Andriulaitis, D.L. Frank and T.H. Oum].

7. *Airline Cost and Performance: Implications for Public and Industry Policies*, Centre for Transportation Studies, University of British Columbia, Vancouver, 1986 [with T.H. Oum and D.W. Gillen].

8. *Canadian Airline Deregulation and Privatization: Assessing Effects and Prospects*, Centre for Transportation Studies, University of British Columbia, Vancouver, 1985 [with T.H. Oum and D.W. Gillen].

B. Chapters in Books

1. "Airport Competition for Freight," (with R. Andriulaitis), in P. Forsyth, D.W. Gillen, J Mueller and H.M. Niemeier (eds.), *Airport Competition, the European Experience*, Ashgate publishing, 2010, pp. 137-147.

2. "Competition between airports: occurrence and strategy", (with I. Kincaid), in P. Forsyth, D.W. Gillen, J Mueller and H.M. Niemeier (eds.), *Airport Competition, the European Experience*, Ashgate publishing,2010, pp. 119-136.

3. "Airport Policy in Canada: Limitations of the Not-for-Profit Governance Model," (with R. Andriulaitis), in C. Winston and Gines de Rus (eds), Aviation Infrastructure Performance: A study in comparative political economy, Brookings, 2008, pp. 136-155.

4. "Airport Marketing: An Oxymoron?" in G. Butler (eds.), *Handbook of Airline Marketing*, McGraw Hill, 1998.

5. "Impediments to Liberalization in Asia Pacific International Aviation," in C. Findlay (ed.), *Asia Pacific Air Transport*, 1997, pp. 65-73.

6. "Canada-U.S. Open Skies" in C. Findlay (ed.), *Asia Pacific Air Transport*, 1997, pp.154-169.

7. "Costing the Movement of Hazardous Materials by Rail," (with W.G. Waters II) in L. Moses and D. Lindstrom, eds., *Transportation of Hazardous Materials: Issues in Law, Social Science and Engineering* (Kluwer Academic Press) 1993, pp.277-294.

8. "Island Programs: The UBC Experience with a Summer Program in France," in A.M. Rugman and W.T. Stanbury (eds.), *Global Perspective: Internationalizing Management Education,* University of British Columbia Centre for International Business Studies, 1992, pp. 345-352.

9. "Canada and the Changing Regime in International Air Transport," in M. Zacher (ed.) *Canadian Foreign Policy and International Economic Regimes*, UBC Press, 1992, pp. 189-214 [with M.E. Dresner].

10. "Costing the Movement of Hazardous Materials by Rail," in L. Moses ed.). *Transportation of Hazardous Materials: Issues in Law, Social Science and Engineering*, Kluwer Academic Publishers, 1991, pp. 6-39 to 6-58 [with W.G. Waters II].

11. "Airline Deregulation in Canada," in K. Button (ed.), *Airline Deregulation: International Experiences*, David Fulton Publishers, London, 1991, pp. 124-179 [with T.H. Oum and W.T. Stanbury].

12. "Airline Deregulation in Canada and Its Economic Effects," in Hayashi (ed.), *The New Dimensions for Public Utility*, (in Japanese), 1990 [with T.H. Oum and W.T. Stanbury].

13. "An Assessment of the Efficiency Effects of U.S. Airline Deregulation via an International Comparison," in E.E. Bailey (ed.), *Public Regulation: New Perspectives on Institutions and Policies*, MIT Press, Cambridge, 1987, pp. 285-320 [with D.W. Caves, L.R. Christensen, and R.J. Windle].

14. "Air Canada," in Mark C. Baetz and Paul W. Beamish (eds.) *Strategic Management: Canadian Cases*, 1986, pp. 127-144 [with D.W. Gillen and T.H. Oum].

15. "Network Effects and the Measurement of Returns to Scale and Density for U.S. Railroads," in Andrew F. Daughety, (ed.), *Analytical Studies in Transport Economics*, Cambridge University Press, 1985, pp. 97-120 [with D.W. Caves, L.R. Christensen and R.J. Windle].

16. "Economic Performance of U.S. and Canadian Railroads: The Significance of Ownership and the Regulatory Environment," in W.T. Stanbury and F. Thompson, editors, *Managing Public Enterprises*, Praeger, New York, 1982, pp. 123-151 [with D.W. Caves, L.R. Christensen and J.A. Swanson].

17. "U.S. Trunk Air Carriers, 1972-1977: A Multilateral Comparison of Total Factor Productivity," in Thomas G. Cowing and Rodney E. Stevenson, editors, *Productivity Measurement in Regulated Industries*, Academic Press, 1981, pp. 47-76 [with D.W. Caves and L.R. Christensen].

C. Papers in Refereed Journals or Conference Proceedings

1. "What do we mean by a level playing field in international aviation," *Transport Policy*, October 2015, Volume 43, pp. 96-103. [with R. Andriulaitis]

2. "The Aviation Value *Chain*: Economic Returns and Policy Issues," *Journal of Air Transport Management,* 2014. [with K. Markhvida]

3. "Introduction," Introduction to proceedings of the 1st European Aviation Conference," *Journal of Air Transport Management,* 2014. [with H.M. Niemeier]

4. "Introduction," Introduction to proceedings of the 13th Hamburg Aviation Conference," *Journal of Air Transport Management,* forthcoming (expected January 2012). [with H.M. Niemeier]

5. "Introduction," Introduction to proceedings of the 12th Hamburg Aviation Conference," *Journal of Air Transport Management,* January 2011, Vol. 17 (1), pp. 1-2. [with H.M. Niemeier]

6. "Introduction," Introduction to proceedings of the 11th Hamburg Aviation Conference," *Journal of Air Transport Management,* July 2009, Vol. 15 (1), pp. 103-105. [with H.M. Niemeier]

7. "Emerging Tourism Markets: Ageing and Developing Economies," (with D Mak) *Journal of Air Transport Management*, 2006.

8. "The Effect of Market Structure on Airline Prices: A Review of Empirical Results", (With I Kincaid), *Journal of Air Law and Commerce*, 2005, Vol. 70 (3), pp. 467-498.

9. "Distortions of Airline Revenues: why the network airline business model is broken," *Journal of Air Transport Management*, 2004, Vol. 10, pp. 3-14.

10. "The Economics and Politics of Taxation and Subsidies for Ports and Airports," *Proceedings of the International Association of Maritime Economists*, Panama, November, 2002, pp. 12 (with Trevor Heaver).

11. "Labour Payouts, Productivity Measurement and Price Cap Regulation," (with W.G. Waters II), *Proceedings*, (U.S. Transportation Research Forum, San Antonio, TX (October 1996) Vol. 2, 688-698, 2000. Also published in *Journal of the Transportation Research Forum* (2000), Vol. 39 (1), pp. 131-144.

12. "Labour payouts, productivity measurement and the price cap approach to regulation" (with W.G. Waters II) *Journal of Transportation Research Forum*, 2000.

13. "Comparing Total Factor Productivity and Price Performance: Concepts and Applications to Canadian Railways", (with W.G. Waters II) *Journal of Transport Economics & Policy*, Vol. 33 (2), pp. 209-220, 1999.

14. "Reregulation of the Airline Industry -- Could Price Cap Regulation Make a Contribution?" (with W.G. Waters II), *Journal of Air Transport Management* Vol. 4, 1998, 47-53.

15. "The Total Factor Productivity of Canadian Railways, 1956-1991," (with W.G. Waters II and A.K. Fok) *Journal of Transport Economics and Policy,* January 1997, pp.93-113.

16. "Aggregation and Accuracy in Measuring Total Factor Productivity: Evidence from Rail Productivity Studies," (with W.G. Waters II) *Journal of Transportation Research Forum*, Vol. 25:2, 1995.

17. "A Sensitivity Analysis of Total Factor Productivity Measurement: Evidence from Rail Productivity Studies," (with W.G. Waters II), World Transport Research (refereed *Proceedings of the World Conference on Transport Research*) Vol. 4, Transport Management, (New York: Elsevier), 1995.

18. "Modelling and Testing the Effect of Market Structure on Price: The Case of International Air Transport," *Journal of Transport Economics and Policy, 1992, pp.171-184* [with M.E. Dresner].

19. "ICAO and the Economic Regulation of International Air Transport," *Annals of Air and Space Law*, Vol. 17, Part II, 1992, pp. 195-211 [with M.E. Dresner].

20. "Concepts, Methods and Purposes of Productivity Measurement in Transportation," *Transportation Research-A*, 1992, Vol. 26A No. 6, pp.493-505 [with T.H. Oum and W.G. Waters II].

21. "A Comparison of the Productivity Performance of the U.S. and Canadian Pulp and Paper Industries," *Journal of Business Administration*, Vol. 20 (1), 1992, pp. 212-235, [with T.H. Oum], also in *Emerging Issues in Forest Policy*, P.N. Nemetz (ed.) 1992, UBC Press, Vancouver, pp. 212-235.

22. "A Note on Capacity Utilization and the Measurement of Scale Economies," *Journal of Business and Economic Statistics*, January 1991, Vol. 9 (1), pp. 119-123 [with T.H. Oum and Y. Zhang].

23. "Airline Deregulation in Canada and its Economic Effects," *Transportation Journal*, Vol. 30 (4), Summer 1991, pp.4-22 [with T.H. Oum and W.T. Stanbury].

24. "Productivity Adjustment to Price Levels in Regulated Rail Markets: Recent Developments in Canada and the United States," *Journal of the Transportation Research Forum*, 1991 Vol. 32 (1), pp. 172-181.

25. "Globalization of the Airline Industry and Implications for Canada," *The Logistics and Transportation Review*, Vol. 26(4), December 1990, pp. 357-367; paper also appeared in *Proceedings*, Canadian Transportation Research Forum, University of Saskatchewan Printing Services, June 1990, pp. 150-159; paper appeared in *The Advocate*, Vancouver Bar Association.

26. "Allocation of Airline Seats Between Stochastically Dependent Demands," *Transportation Science*, August 1990, Vol. 24(3), pp. 183-192 [with S.L. Brumelle, J.I. McGill, T.H. Oum, and K. Sawaki].

27. "Productivity Performance of the Canadian Pulp and Paper Industry," *Canadian Journal of Forest Research*, Vol. 20, No. 6, pp. 825-836, June 1990 [with A. Ghebremichael, D. Frank and T.H. Oum].

28. "Airline Cost Structure and Policy Implications: A Multi-product Approach for Canadian Airlines," *Journal of Transport Economics and Policy*, January 1990, pp.9-34 [with D.W. Gillen and T.H. Oum].

29. "Airline Hub and Spoke Systems," *Journal of the Transportation Research Forum*, Vol. XXX (2), 1990, pp. 380-393 [with T.H. Oum].

30. "Frequent Flyer Programs: Marketing Bonanza or Anti-Competitive Tool?" *Proceedings*, Canadian Transportation Research Forum, University of Saskatchewan Printing Service, May 1989, pp. 433-446. Won honourable mention for best paper. Also published in *Journal of the Transportation Research Forum*, Vol. XXX (1), 1989 pp. 195-201.

31. "Privatization of Air Canada: Why is it Necessary in a Deregulated Environment," *Canadian Public Policy*, Vol. 15 (3), September 1989, pp. 285-299 [with D.W. Gillen and T.H. Oum].

32. "Hedonic versus General Specifications of the Translog Cost Function," *Logistics and Transportation Review*, Vol. 25 (1), March 1989, pp. 3-21 [with T.H. Oum].

33. "The Canada - U.S. Air Transport Bilateral: Will It Be Freed?" *Transportation Practitioners Journal*, Vol. 56 (4), Summer 1989, pp. 393-405, also in *Proceedings*, Canadian Transportation Research Forum, University of Saskatchewan Printing Services, May 1988 [with M.E. Dresner and C. Hadrovic]. Excerpts also appear in Air Transport Management, March/April 1988, Vol. 1 (1).

34. "Ramsey Pricing in the Presence of Externality Costs," *Journal of Transport Economics and Policy*, September 1988, pp. 307-317 [with T.H. Oum].

35. "Duopoly in Canada's Airline Industry: Consequences and Policy Issues," *Canadian Public Policy*, Vol. 14 (1), March 1988, pp. 15-31 [with D.W. Gillen and W.T. Stanbury].

36. "The Changing Role of IATA: Prospects for the Future," *Annals of Air and Space Law*, Vol. 13, 1988 pp. 3-23 [with M.E. Dresner].

37. "Airport Pricing Policies: An Application to Canadian Airports," *Journal of the Transportation Research Forum*, Vol. XXIX, No. 1, 1988. This paper won the A.T. Kearney Inc. Best Paper award at the Transportation Research Forum, Toronto, 1988 [with D.W. Gillen and T.H. Oum].

38. "Policy Choices for Canada in International Air Transport," in *International Business*, Ann Gregory (ed.), refereed proceedings of the Administrative Sciences Association of Canada, Vol. 8, No. 8, June 1987, pp. 83-94 [with M.E. Dresner].

39. "Airline Deregulation: A Bibliography," *Logistics and Transportation Review*, Volume 22 (4), December 1986, pp. 449-489 [with W.T. Stanbury].

40. "Airline Seat Management," *Logistics and Transportation Review*, Vol. 22 (2), June 1988, pp.115-130. Paper also appeared in Proceedings, Canadian Transportation Research Forum, University of Saskatchewan Printing Services, May 1986, pp. 232-245. This paper won the 1986 award for best paper on a management topic. Because of the award, the paper also appeared in the September 1986 Proceedings of the Transportation Research Forum [with D.J.H. Kraft and T.H. Oum].

41. "Entry Barriers and Anti-competitive Behaviour in a Deregulated Airline Market: The Case of Canada," in *International Journal of Transport Economics*, Vol. 15 (1), February 1988; also published in Proceedings, Canadian Transportation Research Forum, University of Saskatchewan Printing Services, May, 1986, pp. 483-493. This paper won the 1986 award for best paper on a policy topic. Because of the award, the paper also appeared in the Sept. 1986 Proceedings of the Transportation Research Forum, [with D.W. Gillen and T.H. Oum].

42. "The Effect of New Entry on Productivity Growth in the U.S. Airline Industry: 1947-1981," *Logistics and Transportation Review*, Vol. 21, No. 4, December 1985, pp. 299-335 [with D.W. Caves, L.R. Christensen, and R.J. Windle].

43. "The Total Factor Productivity of the Canadian Class I Railways: 1956-1981," *Logistics and Transportation Review*, Vol. 21, No. 3, September 1985, pp. 249-276 [with K.D. Freeman, T.H. Oum and W.G. Waters II].

44. "Economies of Density Versus Economies of Scale: Why Trunk and Local Service Airline Costs Differ," *Rand Journal of Economics*, Winter, 1984, pp. 471-489 [with D.W. Caves and L.R. Christensen].

45. "Reforming Canadian Airline Regulation," *Logistics and Transportation Review*, Vol. 20 No. 3, September 1984, pp. 261-284 [with T.H. Oum].

46. "Productivity Performance of U.S. Trunk and Local Service Airlines in the Era of Deregulation," *Economic Inquiry*, July 1983, Vol. 21, No. 3, pp. 312-324 [with D.W. Caves and L.R. Christensen].

47. "Flexible Cost Functions for Multiproduct Firms," *Review of Economics and Statistics*, August 1980, pp. 477-481 [with D.W. Caves and L.R. Christensen].

D. Selected Non-consulting Reports

1. "The Feasibility of Grain-Specific Productivity Measurement for Regulating Railway Grain Rates in Canada," (with W.G. Waters II), for the Canadian Transportation Agency, Ottawa/Hull, 18pp. 14 March 1997.

2. “The Economic Impact of the Vancouver International Airport: Summary Report” February 1995.

3. “The Employment and Economic Impact of the Vancouver International Airport,” February 1995 [with L. Erbe and K. Tse].

4. “A Study of Economic Multipliers and their Application to the Economic Impact of the Vancouver International Airport,” February 1995 [with K. Tse].

5. “The Employment Impact of a South Airport Floatplane operator: Harbour Air”, February 1995 [with L. Erbe and K. Kotlarchuk.].

6. “The Employment Impact of Cathay Pacific’s three times weekly cargo service,” February 1995 [with S. Lui].

7. “The Economic Impact of a Transpacific Cargo Service” November 1994, for the Vancouver International Airport [with S. Lui].

8. “The Economic Impact Of A South Airport Operator: The Case Of Harbour Air,” November 1994, for the Vancouver International Airport [with K. Kotlarchuk and L. Erbe].

9. “The Potential for Separating Rail track infrastructure from rail transportation,” November 1994, for the Bureau of Competition Policy.

10. "Measuring Productivity Performance and Financial Returns for Canadian National and CP Rail, 1956-1991", UBC Centre for Transportation Studies. March 1994, 302pp.

11. "Report of the Ministerial Task Force on International Airline Policy," July 1992. [I was Director of Research for the Task Force].

12. "Monopoly versus Duopoly in Canada's Airline Industry: Policy Alternatives and Consequences," prepared for the Economic Research Branch, Transport Canada, October 1991 [with T.H. Oum].

13. "Comments on Transport Canada's Proposed New Cost Recovery Policy: Phase II Discussion Paper," March 1991 [with T.D. Heaver, G.C. Chow, T.H. Oum and W.G. Waters II].

14. "Critical Review of Economic Analysis of Capacity Enhancement Strategies for Vancouver International Airport," review submitted to Vancouver International Airport's Airside Capacity Enhancement Management Team, November 1989.

15. "Review of Research Report on URCS Regression Equations," in U.S. Interstate Commerce Commission, Uniform Railroad Costing System: Research Report, July 1988, Washington, DC [with W.G. Waters II].

16. "A Study of Peak Period Pricing with an Application to Toronto International Airport," report submitted to Airports Authority Group and Cost Recovery and Evaluation, Transport Canada, May 1988 [with D.W. Gillen and T.H. Oum].

17. "Alberta's Air Transportation System: Strategic Forces and Structural Alternatives," report submitted to Alberta Economic Development, April 1988 [with D.G. Dale, D.L. Frank, S.J. Ling and T.H. Oum].

18. "Logistical Marketing and Vancouver International Airport: The Need for a Strategic Approach," report prepared for Asia Pacific Committee and B.C. Department of Regional and Industrial Expansion, October 1987.

19. "Development of Vancouver International Airport: Environment and Factors Affecting Success," report prepared for Asia Pacific Committee, and B.C. Department of Regional and Industrial Expansion, September 1987.

20. "Bill C-18 Rail Labour Impact Study," submitted to Transport Canada, March 1987 [with the Trade and Transportation Group and the Productivity Study Group, UBC].

21. "The Impact of Bill C-18 on Employment in the Canadian Railway Industry," published as a Technical Report, Transport Canada, February 1987, [with F.W. Trotter].

22. "The Emergence of Airline Families: Issues of Control," report prepared for the Canadian Airline Pilots Association, February 1987.

23. "Grain Costing Indices," confidential report prepared for Trade and Transportation Group for submission in regulatory hearings, Ottawa, November 1986.

24. "Pricing Policies for Canadian Airports with an Emphasis on Airfield Operations," a report prepared for Airports Task Force, Transport Canada, September 1986, [with D.W. Gillen and T.H. Oum].

25. "Pricing Principles for Canadian Airports," a report prepared for Airports Task Force, Transport Canada, July 1986, [with A. Manoucheri, D.W. Gillen and T.H. Oum].

26. "Predatory Pricing in a Deregulated Canadian Airline Industry," confidential report submitted to Bureau of Competition Policy, Consumer and Corporate Affairs Canada, February 1986, [with D.W. Gillen and T.H. Oum].

27. "The Structure of the Canadian Airline System and the Expected Impact of the Movement Toward Deregulation," Three volume report submitted to Treasury Board of Canada, March 1985, [with T.H. Oum and D.W. Gillen].

E. Papers Under Review

1. "What do we mean by a level playing field in International Aviation," accepted for publication in Transportation Policy, forthcoming 2015. [with R. Andriulaitis]

F. Other Publications

1. "Open Skies at Last," Connector, Canadian Business Travel Association, June 1995.

2. "The Role of the Airport in the Post-Resource Economy," published as a working paper of the Vancouver International Airport, and as an appendix to the airport's strategic plan. First published June 1994.

3. "Regionalism in International Air Regulations," Working Paper 92-TRA-011, Faculty of Commerce and Business Administration, The University of British Columbia, Vancouver, December 1992.

4. "On the Urge to Merge," letter to editor, Policy Options, Vol. II (5), June 1990.

5. "Prom Night: Choosing Partners for the Global Airline Dance," Air Transport Management, Vol. 3 (2), May/June 1990, pp. 13-19.

6. "New Runways and the Environment," Air Transport Management, Vol. 3 (1), March/April 1990, p.19.

7. "Peak Period Pricing: An Idea Whose Time Has Come," Air Transport Management, Vol. 2 (1), January/February 1990, pp.16-17.

8. "Airport Pricing and Capacity Expansion: Economic Evaluation of Alternatives," Transport Review, published by Transport Canada, 1990 [with D.W. Gillen and T.H. Oum].

9. "Hidden Agendas are Distorting the Safety Issue," Air Transport Management, Vol. 1 (3), September/October 1988, p.11.

10. "Survival Under Freer Skies," Air Transport Management, Vol. 1 (2), May/June, 1988, pp. 10-12 [with D.W. Gillen and T.H. Oum].

11. "Selling Air Canada: A No-Lose Situation," Globe and Mail, 16 May 1988, p. A7 [with W.T. Stanbury].

12. "The Canada-U.S. Air Transport Bilateral: Will It Be Freed?" Air Transport Management, Vol. 1 (1) March (April) 1988, pp.9-12 [with M.E. Dresner and C. Hadrovic].

13. "Airline Productivity Under Deregulation," Regulation, Nov./Dec. 1982, pp. 25-28, [with D.W. Caves and L.R. Christensen].

14. Many articles written for YVR Skytalk under pen name of Harold Michaels

15. Various articles written in industry trade magazines, including Airport World and Centerlines.

16. Issues in the Regulation of Railways in Mexico. International Transportation Forum of the OECD, forthcoming 2015.

G. Computer Program Papers and Reference Manuals

1. Econometric Programming Language: Programmer's Reference Manual, Computer manual available from Christensen Associates, 810 University Bay Drive, Madison, WI 53705, August 1981 [with S.A. Novogoratz].

2. Econometric Programming Language: Reference Manual, Computer manual available from Christensen Associates, 810 University Bay Drive, Madison, WI 53705, December 1981.

3. Econometric Programming Language: Primer, Computer manual available from Christensen Associates, 810 University Bay Drive, Madison, WI 53705, March 1981.

4. Econometric Programming Language: User's Manual, Computer manual available from Christensen Associates, 810 University Bay Drive, Madison, WI 53705, November 1980 [with D.W. Caves].

5. "Time Series Processor at the University of Wisconsin, Programmer's Reference Manual," mimeo., Department of Economics, University of Wisconsin-Madison, July 1979 [with C. Franklin].

6. "Time Series Processor at the University of Wisconsin (TSP-WISC)," Computer manual available from Madison Academic Computing Center, University of Wisconsin-Madison, October 1977, June 1978 [with D.W. Caves].

7. "Econometric Estimation Using the Time Series Processor at the University Wisconsin (TSP-WISC)," SSRI Discussion Paper #7711, Department of Economics, Madison, September 1977 [with D.W. Caves].

COURSES TAUGHT

Managerial Economics

Business Statistics

Seminar in Transportation Economics

Air Transportation

Urban Transportation

Government and Business

Business Logistics

Logistics and Operations Management

International Business Logistics

Project Evaluation (Social Cost Benefit Analysis, and Environmental Impact Statements)

Transportation in Economic Development

Transportation Policy

Introduction to Transportation

In addition, I have taught short courses in various countries on topics of business logistics, international business logistics, airport management, airport planning, airport strategic planning, airport marketing and airport finance.

OTHER SERVICE

Editorial Boards

Associate Editor, Logistics and Transportation Review, (1987-2001)

Advisory Editor, Quarterly Journal of Economics and Business (1991-2006) (renamed in next entry)

Advisory Editor, Quarterly Journal of Finance and Accounting (2006-present)

Associate Editor, Journal of Air Transport Management (1994-2002)

Referee for the following academic journals:

Air Policy and Management

American Economic Review

Bell/Rand Journal of Economics

Canadian Journal of Economics

Canadian Public Policy

Economic Development and Cultural Change

International Journal of Transportation Economics

Journal of Air Transport Management

Journal of Econometrics

Journal of Economic Education

Journal of Industrial Economics

Journal of Political Economy

Journal of Public Economics

Journal of the Transportation Research Forum

Logistics and Transportation Review

Managerial and Decision Economics

Papers of the Regional Science Association

Quarterly Journal of Business and Economics

Quarterly Review of Economics and Business

Social Science and Humanities Research Council of Canada

Transport Reviews

Transportation Research

Water Resources Research

Reviewer for following publishers:

- MIT Press
- North Holland Publishers
- Transport Research Centre, Australia
- Irwin Books
- McGraw Hill
- Ashgate Publishing

Reviewer for the following funding agencies:

- Earhart Foundation
- Federal Environmental Assessment Review Panel
- National Research Council/Transportation Research Board
- Natural Sciences and Engineering Research Council of Canada
- Social Science and Humanities Research Council of Canada

Appendix C:
List of Previous Engagements as an Expert Witness

Michael William Tretheway

List of Expert Witness Engagements

List is reasonably but not necessarily complete

A. Airport Land Valuation

1. "Statement of Michael W. Tretheway" for Sault Ste. Marie Airport Development Corporation, testimony provided to Supreme Court of Ontario, 2011.
2. Statement of Michael W. Tretheway, for Gander International Airport Authority, testimony provided to Supreme Court of Newfoundland, 2008.
3. "Statement of Michael W. Tretheway" for Gander International Airport Authority, testimony provided to Newfoundland Property Assessment Review Board, 2005.
4. "Statement of Dr. Michael W. Tretheway," prepared for T1T2 Ltd., to the Federal Court of Canada, December 1995.
5. "Expert Statement of Dr. Michael W. Tretheway," Prepared for Counsel to St. John's International Airport Authority, 4 August 2011
6. "Expert Statement of Dr. Michael W. Tretheway," Prepared for Counsel to St. John's International Airport Authority, 4 September 2012
7. "Reply Statement of Dr. Michael W. Tretheway," Prepared for Counsel to St. John's International Airport Authority, 22 January 2013
8. "Expert Statement of Dr. Michael W. Tretheway," Prepared for Counsel to the Toronto Port Authority, 17 December 2012
9. "Reply Statement of Dr. Michael W. Tretheway," Prepared for Counsel to the Toronto Port Authority, 8 January 2013
10. "Expert Statement of Dr. Michael W. Tretheway," In the Supreme Court of New South Wales (Sydney, Australia) between Southern Cross Airports Corporation Pty Limited, plaintiff and Chief Commissioner of State Revenue, defendant, 5 November 2009.
11. I provided 10 other expert statements in this proceeding which continued to 2012.

B. Airport Slot Allocation, Pricing, Leasing and Access Issues

12. "Statement of Michael W. Tretheway" for Toronto Port Authority, testimony provided to Supreme Court of Ontario, 2010.
13. Various statements, testimony provided to Supreme Court of New South Wales, testimony provided for Southern Cross Airports Corporation Ltd. Pty, first statement beginning November 2009.
14. Statement of Michael W. Tretheway, for Vancouver International Airport Authority, testimony provided to Supreme Court of British Columbia, 2008. [commercial lease issues]
15. "Statement of Michael W. Tretheway" for Westfield Management Ltd. and Centra Ltd. testimony provided to Federal Court of Australia (Queensland), 2005.
16. "The Case for a Regulatory Mechanism for Airport Charges at Hong Kong International Airport" for Cathay Pacific Airlines, report provided to Hong Kong Executive-in-Council, 2003.
17. "Need title" for the Canadian Airports Council, testimony provided before the Canadian House of Commons Standing Committee on Finance regarding pending foreign trade zone legislation, 2001?

C. Airport Fees and Charges Issues

18. "Report of Michael W. Tretheway on the issue of potential changes to the Regulatory Control Provisions under the Commerce Act, 1986," report provided to New Zealand Ministry of Economic Development Review of Regulatory Control Provisions, 2007.
19. A similar statement was provided in 2014.
20. "Issues in Establishing Domestic Aeronautical Charges at Sydney Airport", report provided for Sydney Airport Corporation Ltd., to Australia Consumer and Competition Commission, 2007.

D. Airline Mergers and Alliances

21. "Statement of Michael W. Tretheway" for Virgin Blue Airlines, testimony provided to Australia Competition and Consumer Commission, 2010.
22. "Statement of Michael W. Tretheway" for Air New Zealand and Qantas, testimony provided to Australia Competition and Consumer Commissioner, 2006.
23. "Expert Statement of Dr. Michael W. Tretheway", for Qantas and Air New Zealand, provided to the High Court of New Zealand, 2005.
24. "Statement of Michael W. Tretheway" for Air New Zealand and Qantas, testimony provided to Australia Competition Tribunal, 2004. [alliance and investment authorisation request in Australia]
25. "Statement of Michael W. Tretheway" for Qantas and Air New Zealand, testimony provided to New Zealand Commerce Commission, 2003. [alliance and investment authorisation request in New Zealand.]
26. "Statement of Michael W. Tretheway" for Qantas and Air New Zealand, testimony provided to New Zealand Appeals Court, 2003. [alliance and investment authorisation request in New Zealand, appeal]
27. "Expert Statement of Dr. Michael W. Tretheway", for Air New Zealand and Qantas, to the New Zealand Commerce Commission, 2003.
28. "Statement of Michael W. Tretheway" for Lufthansa, United and SAS, testimony provided to the European Commission, 1999.
29. "Statement of Dr. Michael W. Tretheway," prepared on behalf of Qantas Airways Ltd., to the New Zealand Commerce Commission, 1996. [Air NZ - Ansett NZ acquisition]
30. "Statement of Michael W. Tretheway," for Qantas Airways and British Airways before the Australian Trade Practices Commission, September 1994. Additional statements were filed in October 1994, December 1994, January 1995.
31. "Statement in support of the Director of Investigation and Research," submitted to National Transportation Agency, oral testimony given 14 April 1993.
32. "Statement of Dr. Michael W. Tretheway", for Gemini CRS, provided to the National Transportation Agency and Competition Tribunal of Canada on behalf of the Director of Investigation and Research Canada Competition Bureau, 1993.
33. "Statement in Support of the Director of Investigation and Research Gemini 106 Application," submitted to the Competition Tribunal, 30 December 1992, oral statement 9 February 1993.
34. "Strategic Options for Wardair," testimony prepared for the Air Crew Association of Canada (Wardair Pilots) for submission to labour arbitration hearing, November 1989. Reply testimony submitted January 1990.

E. Aviation Regulatory Issues

35. "Statement of Michael W. Tretheway" for WestJet, testimony provided to Canadian Transportation Agency, 2007. [on board oxygen issues]

36. "Statement of Michael W. Tretheway" for WestJet, testimony provided to Canadian Transportation Agency, 2005. [one person one fare issues]
37. "Statement of Michael W. Tretheway" prepared for the Commissioner of Competition, testimony provided to Supreme Court of Quebec, 2002.
38. "Statement of Michael W. Tretheway" prepared for the Commissioner of Competition, testimony provided to Canadian Competition Tribunal, 2002. [predation issues]
39. "Statement of Michael W. Tretheway" for International Air Transport Association, testimony provided to Australia Consumer and Competition Commission, 2001.
40. "Statement of Michael W. Tretheway" for Comair Pty Ltd. (South Africa), testimony provided to South African Civil Aviation Tribunal, 1997.
41. "Statement of Dr. Michael W. Tretheway," 29 April 2001", for the International Air Transport Association before the Australian Competition and Consumer Commission regarding authorization for participation in the IATA passenger agency program.

F. Airline – Other

42. "Statement of Michael W. Tretheway" for Canadian Auto Workers, testimony provided to Canadian Industrial Labour Board, 2002.
43. Expert witness statement prepared for the Canadian Auto Workers representing the pilots of Morningstar Airlines, for submission to labour arbitration panel, 2002.
44. Expert witness statement for the Air Line Pilots Association representing Air BC, for submission to labour arbitration panel, 2001.
45. Expert witness statement for the Air Line Pilots Association representing Air Canada – Canadian Airline International merger, for submission to labour arbitration panel, 2000.
46. "Report on the Growth and Prospects of Regional Carriers," for the Air B.C. Master Executive Council before a labour arbitrator, November 1994.
47. "Analysis of the Effect of the Gemini Computer Reservation System Merger on Competition in the Canadian Airline Industry," affidavit prepared for Consumer and Corporate Affairs Canada for submission to Canadian Competition Tribunal, 1 March 1989.
48. Expert witness statement prepared for the Canadian Union of Public Employees representing flight attendants for submission to labour arbitration panel. 1989
49. Expert witness statement for the Canadian Auto Workers representing airline customer service agents, for submission to labour arbitration panel. 1989.
50. Expert witness statement for the Canadian Air Line Pilots Association for several labour arbitrations. 1989.

G. Railway Industry Rate Arbitrations[84]

51. "Statement of Michael W. Tretheway" for a Canadian railway, testimony provided to rail rate arbitrator appointed under the rail rate arbitration provisions of the Canada Transportation Act, 2002. Under the Canada Transportation Act, arbitrations are confidential, including the names of the parties.

[84] Under the *Canada Transportation Act* (1987 and subsequent revisions), rail rate arbitrations conducted under the *Canada Transportation Act* are confidential proceedings and the names of the parties cannot be revealed, nor the decision or any of the proceedings. I note that all of my rail rate engagements have been for one of CN Rail, CP Rail or the Quebec North Shore and Labrador Railway.

52. Note, I estimate that I have done expert statements for roughly 31 rail arbitrations covering the years 2002 to 2017. I have been engaged by CN, Canadian Pacific Railway and Quebec North Shore and Labrador Railway.

H. Rail – Regulatory & Antitrust

53. “Statement of Michael W. Tretheway” for CN, testimony provided to Canadian Commissioner of Competition, 2004.
54. “Statement of Michael W. Tretheway” for Hallcon Crew Transport, testimony provided to British Columbia Passenger Transport Board, 2006.
55. “Statement of Michael W. Tretheway” for Hallcon Transport Services, testimony provided to the British Columbia Motor Carrier Commission, 2003.
56. "Verified Statement" submitted to U.S. Interstate Commerce Commission on behalf of the Association of American Railroads, Ex Parte 431 (Sub. No. 2), 14 August 1991.
57. "Verified Statement" submitted to U.S. Interstate Commerce Commission on behalf of the Association of American Railroads, Ex Parte 290 (Sub. No. 7), 5 April 1991. Reply verified statement submitted 6 May 1991.
58. "Verified Statement," submitted to U.S. Interstate Commerce Commission on behalf of the Association of American Railroads, Ex Parte 290 (Sub. 4), 14 August 1989 [with W.G. Waters II]. Reply verified statement submitted 29 August 1989.
59. "Physical Versus Deflated Expenditure Approaches Toward Rail Productivity Measurement," verified statement prepared for the Association of American Railroads for submission to the U.S. Interstate Commerce Commission, Ex Parte 290 (Sub. 7), 26 May 1989 [with W.G. Waters II]. Reply Verified Statement submitted 26 June 1989.
60. "Comments," submitted to Canadian National Transportation Agency hearings on VIA Rail Pricing Policies," 30 March 1989 [with T.D. Heaver, T.H. Oum and W.G. Waters II].
61. "Comments" on the Uniform Railroad Costing System," verified statement prepared for the Association of American Railroads for submission to the U.S. Interstate Commerce Commission, Ex Parte 431 (Sub 1), 20 March 1989, Washington, DC [with W.G. Waters II].
62. "Railroad Productivity Measurement," verified statement prepared for the Association of American Railroads for submission to the U.S. Interstate Commerce Commission, Ex Parte 290 (Sub. 4), 16 December 1988 [with W.E. Diewert and W.G. Waters II]. Reply verified statement submitted 17 January 1989.
63. “Title needed”, Rocky Mountaineer Rail Tours Ltd., before the Canada Transportation Act Review Panel, 2000.

I. Transport Policy – General

64. "Submission of the Centre for Transportation Studies, UBC, to the Royal Commission on Passenger Transportation," 6 December 1990, Vancouver [with T.D. Heaver, G.C. Chow, T.H. Oum and W.G. Waters II].
65. "Submission to the Royal Commission on National Passenger Transportation on behalf of the Director of Investigation and Research: Competition Act," 15 November 1990. Submission jointly drafted with staff of the Bureau of Competition Policy and Professor George Wilson (Indiana).

66. "Monitoring the Effects of the National Transportation Act, 1987, and Associated Legislation," a report to Transport Canada, 29 May 1987 [with G.C. Chow, T.D. Heaver, T.H. Oum and W.G. Waters II].
67. "Amendments Recommended to Bills C-18 and C-19," Minutes of Proceedings and Evidence of the House of Commons Standing Committee on Transport, Issue #19, 16 March 1987 [with G.C. Chow, T.D. Heaver, T.H. Oum and W.G. Waters, II].
68. "Analysis of the Changes in Airline Regulation Proposed in Bill C-18," Faculty of Commerce and Business Administration Working Paper, University of British Columbia, Vancouver, presented to House of Commons Standing Committee on Transport on behalf of the Consumers' Association of Canada, March 1987, testimony appears in Minutes of Proceedings and Evidence of the House of Commons Standing Committee on Transport, Issue #17, 12 March 1987, [with W.T. Stanbury].
69. "Comments on Freedom to Move," Minutes of Proceedings and Evidence of the House of Commons Standing Committee on Transport, Issue #37, 19 November 1985 [with T.H. Oum].

J. Ferry & Maritime Regulation & Antitrust

70. Price Cap Review, oral testimony provided to BC Ferry Commission, 2007.
71. “Preliminary Comments on the proposed acquisition of CAST by CP Ltd. subsidiary CANMAR,” confidential report prepared for counsel for Bureau of Competition Policy, 23 March 1995.

K. Other

72. “Statement of Michael W. Tretheway” for AUT Technologies, testimony provided to U.S. circuit court, 2002.
73. "Statement to Commission of Inquiry on Canadian University Education," 6 November 1990.

L. Airport Other

74. “Statement of Michael W. Tretheway” for Vancouver International Airport Authority, testimony provided to Supreme Court of British Columbia, 2000. [noise]

Appendix D:
List of Sources and Documents Relied Upon

List of Sources and Documents Relied Upon[85]

1) Air Canada meal options: https://www.aircanada.com/ca/en/aco/home/plan/special-assistance/special-meals.html.

2) Air Canada, Annual Report, 2016, 2017

3) Airports Council International – World, World Air Traffic Report, 2014,

4) Ben Grady., How Percentage Rent Works in a Commercial Real Estate Lease, January 16, 2014, *Property Metrics,* https://www.propertymetrics.com/blog/2014/01/16/percentage-rent/ .

5) Boeing, "Disruption Costing Methodology ValSim – Visualization and Simulation of Airline Operations", Denver 2007.

6) Catering firm websites: LSG and Sky Chefs http://www.lsgskychefs.com/us/milestones/; LSG and Sky Chefs merge 2001; Gate Gourmet: http://www.reuters.com/article/uk-airlines-catering-idUSLNE85P01H20120626; Gate gourmet bought by Texas Pacific Group in 2002http://www.gategourmet.com/about; http://www.gategroup.com/about/about/our-evolution; SATS https://www.sats.com.sg/AboutUs/ourjourney/ourmilestones/Pages/history.aspx; Newrest http://www.newrest.eu/en/who-we-are/our-history/; Dnata; http://www.dnata.com/english/about-dnata/overview/; Chelsea Food Services https://en.wikipedia.org/wiki/Chelsea_Food_Services; Do & Co History http://www.doco.com/en/ir/the-company/history-of-do-co; Cathay Catering http://www.cpcs.com.hk/eng/history_e.html.

7) Cathay Pacific meal options: https://www.cathaypacific.com/cx/en_CA/travel-information/flying-with-us/inflight-dining/special-meals.html

8) Great circle distance calculator at http://www.telegraph.co.uk/travel/maps-and-graphics/the-longest-flights-in-the-world/world-s-longest-flights-4/

9) IATA, "Aviation Economic Benefits, IATA Economics Briefing No. 8. July 2007.

10) IATA, Value Chain Profitability, IATA Economics Briefing 04, June 2006.

11) International Civil Aviation Organization, Civil Aviation Statistics of the World and ICAO staff estimates obtained from https://data.worldbank.org/indicator/IS.AIR.PSGR.

12) InterVISTAS Consulting, "Estimating Air Travel Demand Elasticities, a report commissioned and published by IATA, 28 December 2007.

13) InterVISTAS Consulting, "Measuring the Economic Rate of Return on Investment in Aviation" December 2006. Report prepared for IATA.

14) LSG Sky Chefs, http://www.lsgskychefs.com/media/news/lsg-sky-chefs-acquires-cls-catering-services-canada/

15) NEXTOR, "Total Delay Impact Study: A Comprehensive Assessment of the Costs and Impacts of Flight Delay in the United States", Revised Final Report, November 2010.

16) .

17) Statistics Canada Air Carrier Traffic at Canadian Airports, 2014

18) *The Max Ward Story,* McClelland & Stewart publishing, 1991,

[85] New references in this supplementary statement are highlighted in boldface type.

19) U.S. DoT required Form 41, annual filing of traffic and financial data. 2017 data used in supplemental statement.

20) U.S. DoT, 2014 Total Passenger Traffic: US Airports: T-100;

21) Vancouver Airport Authority Annual and Sustainability Report, 2016, 2017.

22) Vancouver Airport Authority Letters Patent

23) Vancouver International Airport Authority agreements between VAA and CLS Catering Services (lease and licence agreements)

24) Vancouver International Airport Authority agreements between VAA and Cara Operations Ltd. (lease and licence agreements)

25) Vancouver International Airport Authority "Flight Kitchen Market Analysis Report", undated.

26) Vancouver International Airport Authority, Annual Report 1992.

27) Vancouver International Airport Authority, Annual Report 1995.

28) Vancouver International Airport Authority, Articles of Continuance, February 5, 2013

29) Vancouver International Airport Authority, Traffic Update, December 1992.

30) Vancouver International Airport Authority, Traffic Update, December 2016, 2017.

31) WestJet, Annual Report, 2016, 2017.

32) Data on YVR Concessions provided by counsel: document [redacted]

Appendix E: Underlying Data for Catering Firms vs Passengers at Canadian and Select U.S. Airports

This is the source of data for Figures 3-2 to 3-5.
Catering Firms vs Passengers at Canadian and Select U.S. Airports
Source: InterVISTAS analysis
Date: 30 March 2016[86]

[86] The survey of airports was conducted in 2015 but used traffic data for 2014, which was the most recent data available at the time. The table in this appendix was prepared in 2016.

Airport	Code	Total Passengers (2014)	International Passengers (No Transborder Traffic) (2014)	Number of Catering Firms
Atlanta Hartsfield-Jackson International	ATL	93,194,997	8,335,205	3
Los Angeles International Airport	LAX	69,376,620	13,610,144	3
Chicago O'Hare International Airport	ORD	67,262,969	8,089,966	4
Dallas-Fort Worth, TX, US	DFW	61,545,529	3,610,819	3
San Francisco, CA, US	SFO	45,632,782	7,655,931	3
Las Vegas, NV, US	LAS	41,422,401	935,728	2
Houston-Intercontinental Airport	IAH	39,420,224	5,686,302	2
Toronto Pearson International Airport	YYZ	38,572,416	12,276,895	3
Miami International Airport	MIA	38,012,572	18,045,130	3
Seattle-Tacoma International Airport	SEA	35,694,220	2,391,083	3
Newark Liberty International Airport	EWR	34,982,840	9,585,853	2
Orlando International Airport	MCO	34,616,516	2,938,983	3
Minneapolis/St. Paul International Airport	MSP	33,697,308	1,082,172	1
Detroit Metropolitan Airport	DTW	31,248,484	2,598,809	2
Boston Logan International Airport	BOS	30,712,916	3,871,450	2
Philadelphia, PA, US	PHL	29,578,868	3,131,164	2
New York-La Guardia Airport	LGA	26,535,762	50,783	1
Fort Lauderdale International Airport	FLL	23,899,134	3,211,131	2
Baltimore/Washington International Airport	BWI	22,456,878	472,365	2
Chicago Midway International Airport	MDW	21,409,264	113,339	2
Washington Dulles International Airport	IAD	20,663,188	6,273,546	3
Salt Lake City International Airport	SLC	20,168,768	129,385	1
Reagan National Airport	DCA	20,086,902	66,126	2
Vancouver International Airport	YVR	19,482,626	4,358,797	2
San Diego International Airport	SAN	18,905,922	280,416	2
Honolulu International Airport	HNL	18,748,082	4,662,850	2
Tampa International Airport	TPA	17,091,650	327,846	2
Portland International Airport	PDX	15,703,318	252,963	1
Calgary International Airport	YYC	15,261,108	1,412,302	2
Montreal Trudeau International Airport	YUL	14,821,100	5437896	3
Lambert St. Louis International Airport	STL	12,608,860	32,094	1
Houston Hobby International Airport	HOU	12,484,344	568	2
Nashville International Airport	BNA	11,158,482	10,563	0
Austin–Bergstrom International Airport	AUS	10,713,736	98,892	1
Oakland, CA, US	OAK	10,411,646	45,414	1
Kansas City International Airport	MCI	10,326,792	772	2
Louis Armstrong New Orleans International Ai	MSY	9,956,344	2,725	1
Dallas-Love, TX, US	DAL	9,638,370	2,807	1
San Jose, CA, US	SJC	9,401,648	90,787	2
Raleigh/Durham, NC, US	RDU	9,309,152	119,321	1
Orange County, CA, US	SNA	9,213,634	-	1

Airport	Code	Total Passengers (2014)	International Passengers (No Transborder Traffic) (2014)	Number of Catering Firms
Sacramento, CA, US	SMF	8,936,978	262	1
San Antonio, TX, US	SAT	8,303,022	10,470	1
Edmonton International Airport	YEG	8,240,161	420,896	3
Ottawa Macdonald-Cartier International Airpo	YOW	4,616,448	439,075	2
Winnipeg Richardson International Airport	YWG	3,669,797	178,641	2
Halifax Stanfield International Airport	YHZ	3,663,039	320,800	2
Victoria International Airport	YYJ	1,650,165	23,896	1
Kelowna International Airport	YLW	1,602,899	34,178	1
St. John's International Airport	YYT	1,580,000	103,808	1
Quebec City Lesage International Airport	YQB	1,510,047	352,891	1
Saskatoon Diefenbaker International Airport	YXE	1,484,615	29,002	1
Regina International Airport	YQR	1,262,577	-	2
Thunder Bay International Airport	YQT	739,837	-	1
Greater Moncton International Airport	YQM	677,159	37,768	1
London International Airport	YXU	479,928	28,397	0
Prince George Airport	YXS	445,929	-	0
Yellowknife Airport	YZF	359,384	-	0
Charlottetown Airport	YYG	317,827	-	0
Nielsen Whitehorse International Airport	YXY	305,179	-	1
Fredericton International Airport	YFC	297,867	-	0
Saint John Airport	YSJ	248,820	-	0
Gander International Airport	YQX	195,961	6,049	1

Appendix F:
Indicative Calculation of VAA Revenues of an Incremental Flight

Below are the details and data used for my estimation of the incremental revenue to VAA from a typical long haul intercontinental flight, as discussed in Section 5.9.

Indicative Calculation of VAA Revenues of an Incremental Flight

Fee category	**$000**	**Per pax**
Landing Fees	$ 45,948	$ 2.06
Terminal Fees	$ 90,001	$ 4.04
AIF	$ 159,351	$ 7.15
parking revenues	$ 37,139	$ 1.67
subtotal	*$ 332,439*	*$ 14.91*
annual reveneus from flights		
concessions revenue	$ 130,558	$ 5.85
2017 passengers	24,200,000	
source: VAA Annual and Sustainability Report 2017		

Example flight		
seats	300	
Load factor	80%	
pax/1way per flight		240
two ways	2	480
Annual pax	365	175,200
Subtotal, VAA annual rev from flight	$ 13.95	**$ 2,444,621**
VAA revenue from concessions	$ 5.17	$ 905,100
Total, VAA annual rev from flight		$ 3,349,722

Update for 2017

Indicative Calculation of VAA Revenues of an Incremental Flight (2017)

Fee category	$000	Per pax	
LF	$ 45,948	$ 2.06	
TF	$ 90,001	$ 4.04	
AIF	$ 159,351	$ 7.15	
parking	$ 37,139	$ 1.67	
subtotal	*$ 332,439*	*$ 14.91*	
concessions	$ 130,558	$ 5.85	
2017 passengers	24,200		
source: VAA Annual and Sustainability Report 2017			

Example flight		
seats	300	
Load factor	80%	
pax/1way per flight		240
two ways	2	480
Annual pax	365	175,200
Subtotal, VAA annual rev from flight	$ 14.91	**$ 2,611,808**
VAA revenue from concessions	$ 5.85	$ 1,025,729
Total, VAA annual rev from flight		$ 3,637,537

Appendix G: Acknowledgement of Expert Witness

ACKNOWLEDGEMENT OF EXPERT WITNESS

I, Michael W. Tretheway, acknowledge that I will comply with the Competition Tribunal's code of conduct for expert witnesses which is described below:

1. An expert witness who provides a report for use as evidence has a duty to assist the Tribunal impartially on matters relevant to his or her area of expertise.

2. This duty overrides any duty to a party to the proceeding, including the person retaining the expert witness. An expert is to be independent and objective. An expert is not an advocate for a party.

_____
Michael W. Tretheway
signed at Toronto Ontario
11 January 2018

and 1 August 2018 at Cross Plains Wisconsin USA

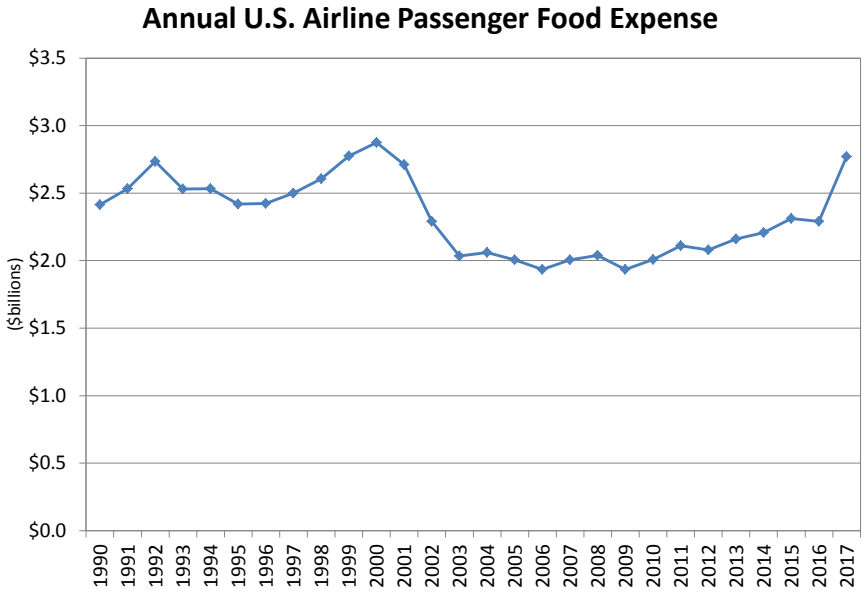
Appendix H:
List of Abbreviations

List of Abbreviations

AC	Air Canada (“Air Canada” is the official corporate name – no Inc. Ltd., airline or airways)
AIF	Airport Improvement Fees
ASD	Air Service Development
CEO	Chief Executive Officer
FBO	Fixed Base Operator
FSA	Full Service Airline
IATA	International Air Transport Association
InterVISTAS	InterVISTAS Consulting Group, or InterVISTAS Consulting Inc.
LCC	Low Cost Carrier
MRO	Maintenance and Repair Organization
NAS	National Airport System
ORD	Chicago O’Hare International Airport
RHDHV	Royal HaskoningDHV (parent of InterVISTAS)
ROIC	Return on Invested Capital
TPA	Toronto Port Authority (operator of Toronto Island Airport)
U.S.	United States of America
UBC	University of British Columbia
UK	United Kingdom
VAA	Vancouver Airport Authority
ULCC	Ultra Low Cost Carrier
WJ	WestJet Airlines Ltd.
YEG	Edmonton International Airport
YVR	Vancouver International Airport
YYZ	Toronto Pearson International Airport

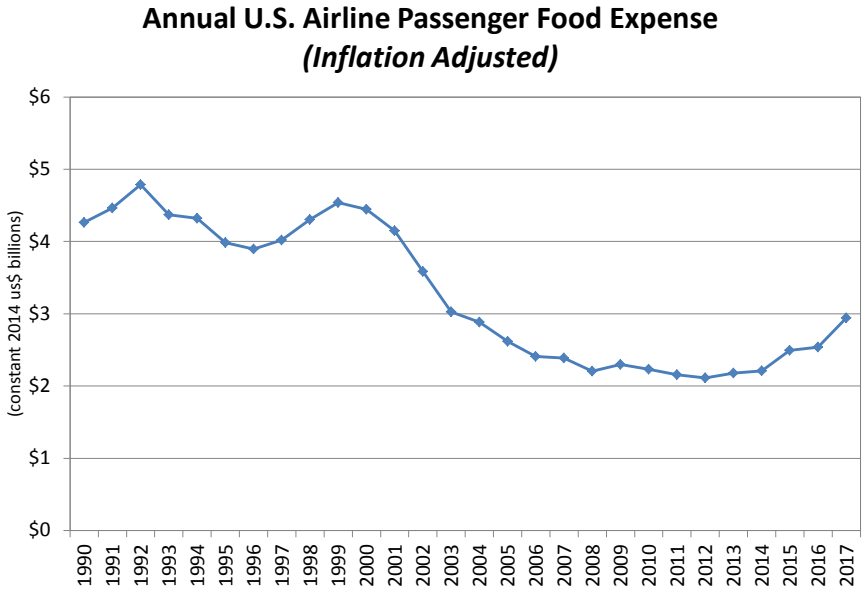
Appendix J:
Updated Figures 3-2 to 3-5

Figure 3-2 updated
Annual U.S. Airline Passenger Food Expense Current (nominal) dollars
1990-2017



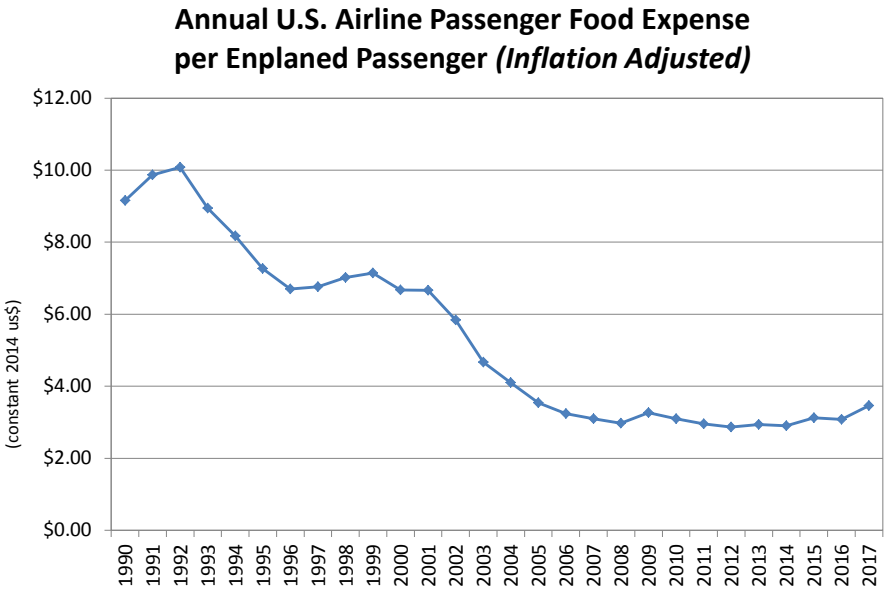
Source: Form 41, Schedule P-6.

Figure 3-3 updated
Annual U.S. Airline Passenger Food Expense
Real (inflation adjusted) dollars
1990-2017



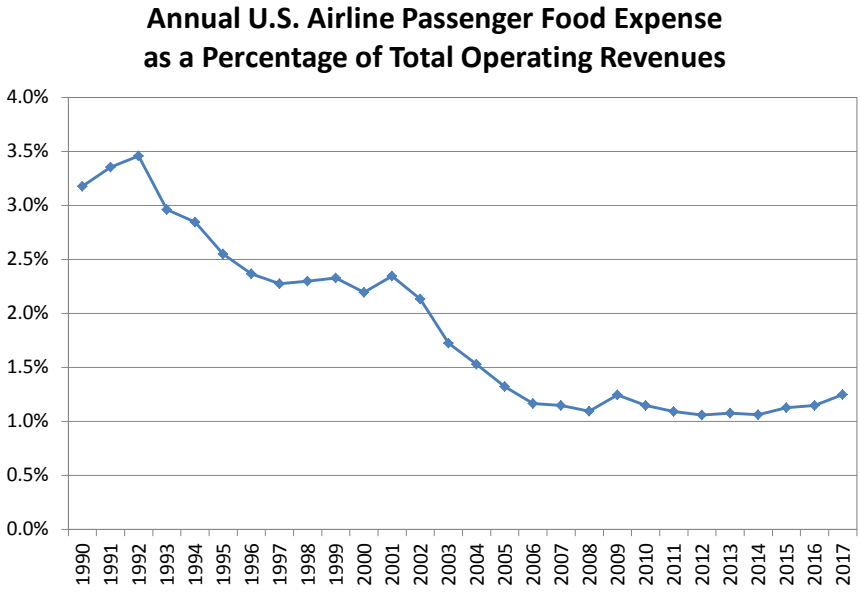
Sources: Form 41, Schedule P-6. U.S. Producer Price Index used for Inflation Adjustment from the Bureau of Labor Statistics (https://data.bls.gov/timeseries/WPU00000000).

Figure 3-4 updated
Annual U.S. Airline Passenger Food Expense *Per Passenger*
Real dollars
1990-2017



Sources: Food Expense Data from Form 41, Schedule P-6., Passenger Data from Airlines for America (www.airlines.org),
U.S. Producer Price Index used for Inflation Adjustment from the Bureau of Labor Statistics (https://data.bls.gov/timeseries/WPU00000000).

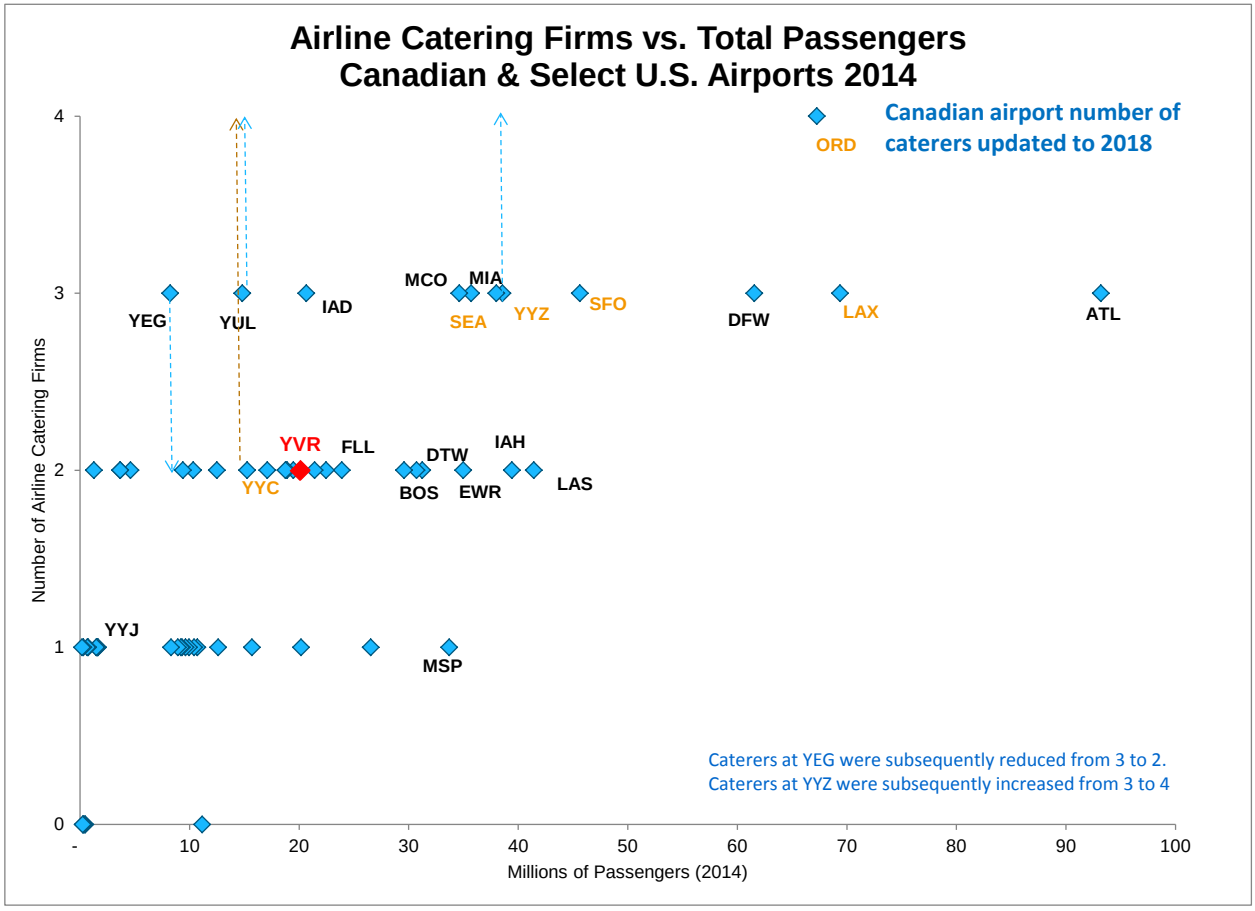
Figure 3-5 updated
Annual U.S. Airline Passenger Food Expense as a Percentage of Total Operating Revenues
1990-2017



Source: Food Expense Data from Form 41, Schedule P-6., Total Operating Revenue Data from Form 41, Schedule P-1.1 and Schedule P-1.2.

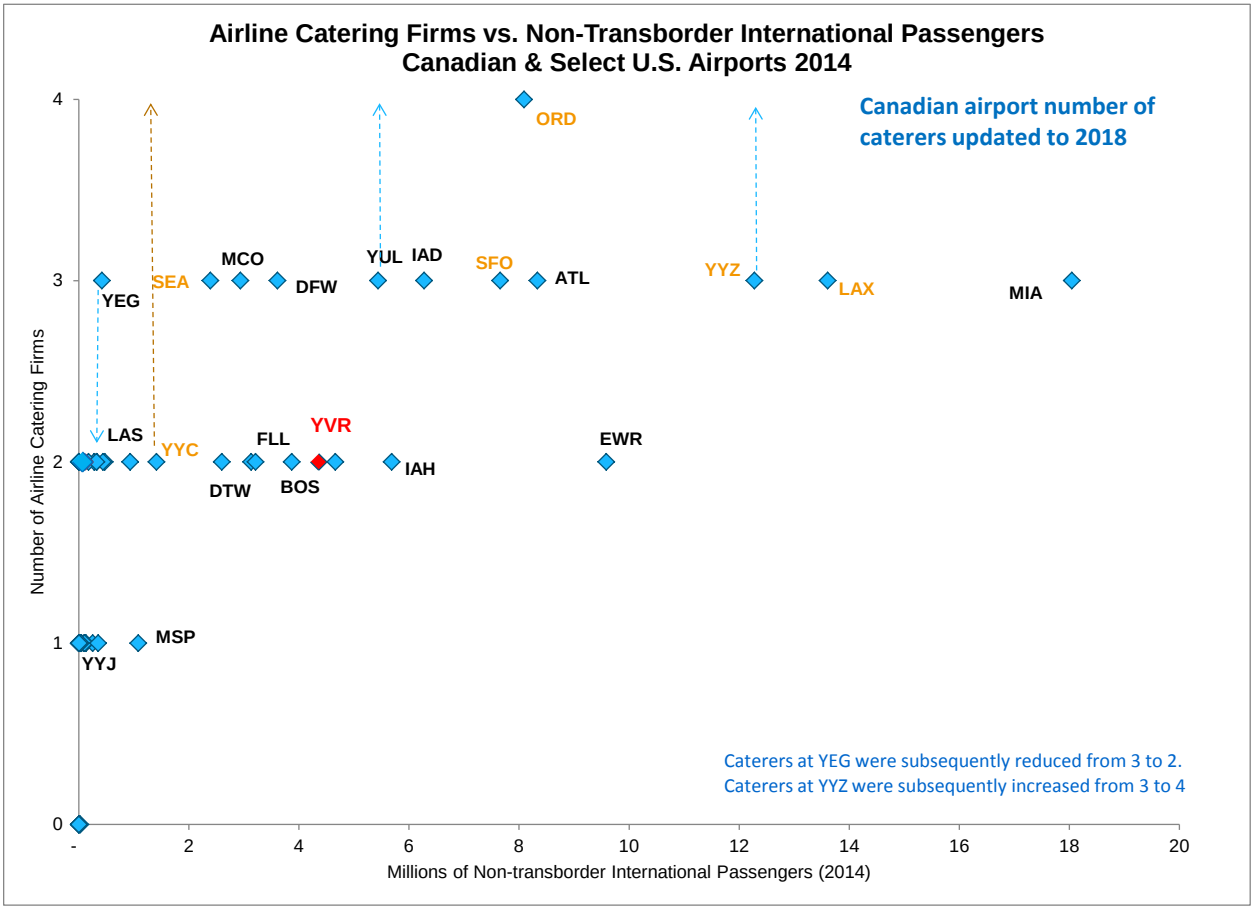
Appendix K:
Update on the Number of Catering Firms at Canadian Airports

Figure 4-1 Updated
Airline Catering Firms versus *Total* Passengers
at Canadian & Select U.S. Airports
2014
Canadian number of caterers updated to 2018



Source: 2014 Total Passenger Traffic: US Airports: T-100 data From DIIO; Canadian Airports: ACI World Air Traffic Report, 2014, Statistics Canada Air Carrier Traffic at Canadian Airports, 2014 & airport site statistics. Number of catering firms obtained from 2014 Inter*VISTAS* survey of airports.

Figure 4-2 Updated
Airline Catering Firms vs. non-transborder *International* Passengers
at Canadian & Select U.S. Airports
2014
Canadian number of caterers updated to 2018



Source: 2014 International Passenger Traffic (No Transborder): Diio, US DOT T-100 Data; Statistics Canada Air Carrier Traffic at Canadian Airports, 2014 & airport site statistics. Number of catering firms obtained from Inter*VISTAS* survey of airports