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AEROMOBILE SPRAWL

Mass Air Travel and its Socio-Environmental Impact in 1970s Canada

In May 1971, a ›Mr. and Mrs. Frederick Horace Colburn‹ of suburban Vancouver, Canada filed suit against Canadian Pacific Air, then Canada's second largest air carrier, for injury to their property and family due to ›noise, vibrations, and noxious and pestilential fumes‹. The Colburns lived near Vancouver International Airport, south of the city's downtown, and were angry that the airport had grown busier and the planes using it noisier in recent years.¹ Beyond trying to put a price on the disruption they had been experiencing, the Colburns' suit served to draw attention to aviation's creeping impact in and around their community.

This article examines the rise of aeromobile sprawl in Canada, focusing especially on the 1970s because this was not only when such sprawl materialized and accelerated across the country, but also when the Canadian state and public first took serious notice of it. Although the term itself did not come into use at the time, aeromobile sprawl is a useful identifier for explaining the changes that people like the Colburns witnessed. I define aeromobile sprawl as aviation's socio-environmental impact on people, places, and things. I link it largely to state-led airport development and the effect that upgrading, expanding, and building new airports had on communities and landscapes. Accordingly, I show that while aeromobile sprawl was to some extent an outcome of postwar developments not limited to aviation, the Canadian government and its partners also contributed to more sprawl by endorsing various policies and strategies that shifted over the period in question. At the same time, I contend that these actions did not go unnoticed. Public critiques of aeromobile sprawl also emerged

1 Jean Baker, *Plane vs. Man War Climax Nears*, in: *Richmond Review*, 26 May 1971, p. 1.

by the late 1960s as people increasingly objected to larger and busier airports operating near populated and non-industrial areas. Consequently, the article demonstrates that debates in Canada about aviation's rapid growth and airport modernization revealed sharply diverging views about how to best accommodate the mobility requirements of mass air travel within the country's natural and built environments in the 1970s.

The article first summarizes the postwar historical developments that created the conditions for aeromobile sprawl in Canada. Following this, it discusses a key aspect of aeromobile sprawl – noise – to show how larger and busier airports infringed on surrounding communities and why public critiques of airport modernization soon emerged. Over the span of two sections, it focuses on events in Vancouver in the early 1970s, where these critiques were most visible, shifting from government responses to Vancouver's noise problem to local mobilization efforts against daily noise as well as future airport expansion. Lastly, it briefly discusses the government's embrace of new mega-airports in Montreal and Toronto, which, although initiated in the late 1960s, played out primarily against the backdrop of noise complaints in Vancouver. In particular, it shows that mega-airports, despite being planned to avoid local disputes like the one in Vancouver, had their own social and environmental impact and thus continued aeromobile sprawl in a different form.

My research contributes to existing scholarship in three ways. First, it builds on recent work on aeromobilities that views airports as active infrastructure where constant change occurs as the mass air transport system grows and evolves.² It suggests that aeromobile sprawl is both a cause and effect of this process. Second, it contributes to discussions about mobility and environment, including in this journal issue, concerning how specific modes of movement have transformed the landscape over time.³ In contrast to other kinds of sprawl, it largely ties aeromobile sprawl to airports because of the particular features of mass air travel.⁴ As such, it provides a case study of how changes to and around airports reflected air travel's deepening social, environmental, and spatial impact at a time of rapid growth. Third, it links mass air travel and airports to writing on postwar modernity, technology, and society. It does this by tying national debates about aeromobile sprawl to techno-scientific ideas of development

2 See especially Gillian Fuller/Ross Harley, *Aviopolis. A Book About Airports*, London 2004. On airports and air travel, see also John Urry, *Mobilities*, Cambridge 2007, chapter 7.

3 The literature on this subject is growing across disciplinary and national borders. In Canada, the conversation is just beginning. See the various essays in Ben Bradley/Colin Coates/Jay Young (eds), *Moving Natures. Mobility and Environment in Canadian History*, Calgary 2016.

4 On aviation and sprawl, see also David Pascoe, *Airspaces*, London 2001, pp. 96-99. The sprawl from auto and rail travel was less concentrated in and near a particular place. For examples of much of the recent work on the car, see Claire Poitras, *A City on the Move: The Surprising Consequences of Highways*, in: Stephane Castonguay/Michele Dagenais (eds), *Metropolitan Natures. Environmental Histories of Montreal*, Pittsburgh 2011, pp. 168-183; Owen Gutfreund, *Twentieth Century Sprawl. Highways and the Reshaping of the American Landscape*, New York 2004. On the train, see Wolfgang Schivelbusch, *The Railway Journey. The Industrialization of Time and Space in the Nineteenth Century*, Berkeley 1986.

that held sway in North America after 1945 and helped shape large-scale transport and infrastructure projects.⁵ Taken as a whole, the article shows how scholars can gain a better understanding of aeromobile sprawl by studying events in Canada, where changes at and around airports were especially evident and had a significant impact on local communities and environments in the 1970s.

1. The Jet Age, Suburbs, and Aeromobile Sprawl

The collision of mass air travel and suburbanization in the postwar era helped pave the way for aeromobile sprawl. On the one hand, the jet age changed the complexion of air travel and the function of airports. Air travel's popularity soared following the introduction of the first jet aircraft in the late 1950s.⁶ This marked the beginning of an era when planes became larger, faster, safer, and able to fly long-distance routes. Moreover, in North America and, later, Western Europe, postwar economic growth, an increase in disposable income, and a gradual lowering of airfares also served to stimulate public interest in air travel.⁷ In Canada, growth began even before the jet age and accelerated thereafter. Between 1948 and 1958, aircraft take-offs and landings increased more than 400 percent, and in 1960 Canadian commercial airlines carried over 5.5 million passengers, an increase of more than 300 percent during the previous decade.⁸ Of all Canadian airports, Montreal-Dorval, Toronto-Malton, and Vancouver International experienced the brunt of the increases, processing 54 percent of all air travellers in Canada by 1966.⁹ In real numbers, Toronto, the nation's busiest airport by the early 1960s, saw its annual air traffic almost quadruple between 1962 and 1970, rising from 1.48 million to 6.4 million travellers.¹⁰

These developments spurred the Canadian government to examine the state of the country's airports. Air travel's rising popularity and rapid technological advances had placed enormous pressure on many existing airports, which were not equipped for mass air travel and the larger, faster planes entering service.¹¹ As a result, the

5 For a recent example of work on this subject in Canada, see Tina Loo/Meg Stanley, *An Environmental History of Progress: Damming the Peace and Columbia Rivers*, in: *Canadian Historical Review* 92 (2011), pp. 399-427.

6 Peter Pigott, *Flying Colours. A History of Commercial Aviation in Canada*, Vancouver 1997; Marc L.J. Dierikx, *Clipping the Clouds. How Air Travel Changed the World*, Westport 2008; Kenneth Hudson, *Diamonds in the Sky. A Social History of Air Travel*, London 1979.

7 Peter Lyth/Marc Dierikx, *From Privilege to Popularity: The Growth of Leisure Air Travel since 1945*, in: *Journal of Transport History* 15 (1994), pp. 97-116.

8 B.W. Torell, *Transportation – Catalyst to Progress*, in: *Canadian Aeronautical Journal*, September 1960, p. 249.

9 V. Setty Pendakur, *Airport Access in Canada*, Ottawa 1972, p. 16.

10 T.M. McGrath, *History of Canadian Airports*, 2nd ed. Toronto 1992, pp. 231, 233.

11 Peter Pigott, *Gateways: Airports of Canada*, Lawrencetown Beach 1996, pp. 40-45.

government undertook a massive program of airport modernization over a twenty-year period beginning in the mid-1950s, upgrading ground infrastructure across the country and building new passenger terminals in key cities that had begun to handle the vast majority of the nation's air traffic.¹² It spent \$20 million on airports in 1955, \$38 million in 1957, and \$61 million in 1958, no small numbers by contemporary standards.¹³ Federal spending continued to rise in the 1960s and 1970s. Between 1961 and 1971, the Department of Transport spent more than \$300 million more on airport construction, an amount that tripled again over the following ten years.¹⁴

At the same time, more homeowners found themselves near airports that were undergoing radical change and growth. Before 1945, Canadian officials and aviation enthusiasts had generally agreed that new airports should not be within cities.¹⁵ This decision was based partly on technical concerns, namely giving aircraft enough runway space to produce the required lift for flight, as well as the fact that daily air traffic was often light, limited to sporadic commercial flights, single-piloted aircraft, and the occasional charter plane.¹⁶ Consequently, government officials and planners built most airports in areas that were at some distance from city centres; what became Toronto-Pearson, Montreal-Dorval and Vancouver International airports were built about twenty-five, thirty, and twenty kilometres from downtown respectively.¹⁷

Postwar suburbanization, however, gradually eroded the isolation of airports.¹⁸ On the one hand, the growing appeal of suburban living led developers to buy formerly agricultural land around Canadian cities to accommodate public demand and offer low prices, sometimes with government assistance.¹⁹ At the same time, most government

12 McGrath, *History of Canadian Airports* (fn. 10), p. 51. The cities were Toronto, Montreal, Vancouver, Calgary, Edmonton, Winnipeg, Ottawa, and Halifax. Together they handled 68.6 percent of air passengers in 1956, a figure that rose to more than 75 percent ten years later. Pendakur, *Airport Access in Canada* (fn. 9), p. 16.

13 In Canadian dollars. *Canadian Architect*, January 1959, p. 33. These figures equate to \$181.4 million, 332.9 million, and 516.7 million, respectively, in 2016 Canadian dollars. From this point on, I will refer to Canadian dollars simply as dollars.

14 W.H. Huck, The Canadian Air Transport Administration: Its Philosophy, Its Framework for the Future, in: *Canadian Aeronautics and Space Journal*, October 1971, p. 325. The \$300 million figure equates to \$1.87 billion in 2016 dollars.

15 Other countries shared this mindset. See Janet R. Bednarek, *America's Airports. Airfield Development, 1918–1947*, College Station 2001, especially chapter 1.

16 Pigott, *Gateways* (fn. 11), pp. 21–23; McGrath, *History of Canadian Airports* (fn. 10), pp. 1–50.

17 Before the jet age, municipal governments largely owned and operated city airports, only turning later to the federal government to assume management and control once they became more expensive to run. Vancouver purchased land for what would become its international airport in 1929, Toronto in 1931, and Montreal in the early 1940s.

18 Several major developments precipitated the suburban boom, among them the decline of quality of life in cities, the introduction of the streetcar and the automobile, and rising postwar affluence. On the history of suburbanization in Canada, see Richard Harris, *Creeping Conformity. How Canada Became Suburban, 1900–1960*, Toronto 2004.

19 Developers presented a >packaged< suburban ideal to consumers and in some cases had their projects publicly subsidized. See Samuel D. Clark, *The Suburban Society*, Toronto 1966, pp. 6–7, 32–33, 48; Harris, *Creeping Conformity* (fn. 18), p. 123.

officials, aviation representatives, and housing developers believed that airports were and would remain residential-friendly in the jet age. Among other things, they felt that air travel's growth would offer residents near airports job opportunities and favourable property values. For example, plans for Edmonton's new international airport, which opened in 1960, included the construction of two new subdivisions in Leduc, five kilometres from the airport, containing over 600 lots at a total cost of nearly \$10 million.²⁰ In this planning vision, airports and suburbs formed a symbiotic relationship, with airports playing a critical role in community life as its economic lifeline.

Similarly, other subdivisions near airports rapidly filled in during the postwar era. Etobicoke and Mississauga, Ontario, located east and southwest, respectively, of Toronto International Airport, both saw incredible growth. Etobicoke grew from 53,779 residents in 1951 to 202,000 in 1971, while Mississauga had 30,000 residents at mid-century and more than 174,000 twenty years later.²¹ Meanwhile, Richmond, southeast of Vancouver International Airport, also exploded in the mid-twentieth century, climbing from 8,000 residents in 1930 to 43,323 in 1961 and 96,154 in 1981.²² Richmond's stunning growth reflected the broader postwar population boom in the Greater Vancouver Area, where the number of inhabitants increased from 374,000 in the early 1940s to more than 1,000,000 thirty years later.²³ Thus, as Canadian subdivisions ballooned in the postwar decades, the land adjacent to airports filled in, irrevocably bringing suburban communities and airports into the same geographical space.

Although originally touted by developers as an advantageous settlement option, suburbs near major Canadian airports became less attractive places to live once airports began seeing more passenger traffic and handling larger jet planes. Locals soon took notice of the changing socio-environmental impact of these airports. In Toronto, for example, residents protested about noise from departing and arriving planes at Toronto-Pearson with greater frequency by the late 1960s, with 600 people attending the inaugural meeting of the Society for Aircraft Noise Abatement in September 1968.²⁴ Aircraft noise in particular turned many homes into undesirable properties. In 1972, Air Canada pilot Dave Muckle claimed that real estate agents were scheduling

20 *Edmonton Journal*, 12 November 1960, p. 40.

21 Roger E. Riendeau, *Settlement and Lost Villages. A History of Toronto Township*, in: Frank A. Dieterman (ed.), *Mississauga. The First 10,000 Years*, Toronto 2002, pp. 123-141, here p. 141; Peel Region Population Data, 1971, Statistics Canada; Clark, *The Suburban Society* (fn. 19), p. 9; John Sewell, *The Shape of the Suburbs. Understanding Toronto's Sprawl*, Toronto 2009, p. 27. This growth was part of a significant population increase in Toronto's suburban population in the postwar era; in 1967, it had reached 1.2 million. See Lawrence Solomon, *Toronto Sprawls. A History*, Toronto 2007, pp. 56, 63.

22 City of Richmond Archives, Government Publications 416, Township of Richmond Planning Department, Official Community Plan Issue Paper No. 6: Environment: Aircraft Noise, April 1985, p. 11.

23 Leslie J. Ross, *Richmond: Child of the Fraser*, Richmond 1979, pp. 114, 178. Vancouver's population figures are cited in Christopher Dummitt, *The Manly Modern. Masculinity in Postwar Canada*, Vancouver 2007, p. 11.

24 Elliot J. Feldman, *The Politics of Canadian Airport Development. Lessons for Federalism*, Durham 1983, p. 83. See also *Toronto Star*, 17 October 1973, p. B1.



Noise research and noise reduction programs have become important since the 1960s not only in Canada, but also in the United States. The noise meter shown in the photo, taken at Boston Logan International Airport in June 1973, recorded over 86 decibels.

(Wikimedia Commons; National Archives and Records Administration [NARA], Environmental Protection Agency [EPA], Photo: Michael Philip Manheim/Public Domain)

visits to houses on sale near Toronto on days when planes were not using the nearest runway and lobbying federal authorities to pressure pilots to minimize noise during take-offs and landings.²⁵

By the early 1970s, Canada's busiest airports were epicentres of aeromobile sprawl. This was a product of the collision between two radically different postwar planning approaches, jet-age airport development and suburbanization, that saw airports grow in size and volume just as more people moved into adjacent neighbourhoods from the city. The rise of noise complaints around airports revealed that these two projects could not be easily reconciled once they intersected and began to consume the same space. It also underlined how aeromobile sprawl extended into a wider space and unsettled the postwar suburban landscape, creating the conditions for local resistance and a critical reevaluation of the role of airports within urban environments.

25 *Canadian Aviation*, March 1972, p. 34. Noise could be reduced if pilots dispensed with certain recommended safety procedures during departures and landings.

2. ›Sorry About The Noise‹ Government and Aeromobile Sprawl

More than anywhere else in the country, events in Vancouver shaped the Canadian government's response to aeromobile sprawl, and specifically aircraft noise. Mirroring other cities in Canada, noise complaints near Vancouver International Airport occurred more frequently by the early 1970s, drawing in government officials, planners, and homeowners with different ideas about how to respond. Public debates about noise represented a microcosm of the ways in which changes to and around airports had begun to infringe on local communities across the country. The government did take steps to manage the noise problem, but its strategy was guided by postwar technoscientific thinking that stressed the role of expertise and the control and alteration of nature to achieve development and progress.²⁶ This led it to conceive of noise in abstract and objective terms and ignore the fact that sound perception was inherently a subjective and individualized experience.²⁷ In basic terms, they focused on convincing people living near airports that noise was an irreversible part of the jet age.

Aviation-related noise became part of a modern soundscape that had begun to crystallize in North America from industrialization and urbanization in the late nineteenth century and that governments had been slow to regulate.²⁸ But jet aircraft dramatically accelerated local complaints about noise and efforts to control it. Jet aircraft engines produced loud thrust during climbing procedures – much louder than the older, turbo-propeller planes still in service – which exponentially increased the total area affected by airport noise.²⁹ The noise from jet aircraft proved impossible to ignore for some people who heard it nearby, prompting the federal Ministry of Transport to look at reducing it soon after these planes first flew in Canada. In 1959, it

26 James C. Scott, *Seeing Like A State. How Certain Schemes to Improve the Human Condition Have Failed*, New Haven 1998, especially introduction and chapter 1; Timothy Mitchell, *Rule of Experts. Egypt, Techno-Politics, Modernity*, Berkeley 2002. On the role of experts and techno-politics in postwar Canada, see Tina Loo, *People in the Way: Modernity, Environment, and Society on the Arrow Lakes*, in: *BC Studies* 142/143 (Summer/Autumn 2004), pp. 161-196.

27 As sensory scholars have noted, sound perception is a socially constructed experience that is subject to a variety of factors. Unwanted sounds become noise to the individual, a process shaped by their relationship to their environment and the socio-spatial circumstances underlying exposure to that particular sound. See Emily Thompson, *The Soundscape of Modernity. Architectural Acoustics and the Culture of Listening in America, 1900–1933*, Cambridge 2002, p. 2.

28 On the emergence of the modern soundscape, see Thompson, *The Soundscape of Modernity* (fn. 27); Karin Bijsterveld, *Mechanical Sound. Technology, Culture, and Public Problems of Noise in the Twentieth Century*, Cambridge 2008. Canada had very few municipal noise by-laws before 1970, and those that did exist were not part of a larger regulatory thrust. See World Soundscape Project, *A Survey of Community Noise By-laws in Canada*, Burnaby 1972.

29 Thrust is a reaction process where acceleration in one direction produces an equal force in the opposite direction. Aircraft generate thrust by pushing air in the opposite direction of flight. See Barnes W. McCormick, *Aerodynamics, Aeronautics, and Flight Mechanics*, 2nd ed. New York 1995, pp. 284-356.

commenced preliminary studies on noise abatement and instituted a curfew at Montreal-Dorval as well as landing restrictions at Dorval, Toronto, and Winnipeg the following year.³⁰

In contrast to surface-based noises like automobiles and industrial machinery, a plane's acoustic footprint could be particularly intensive and extensive because it originated at higher altitudes and could pass directly over a listener. Depending on one's exact location, the sound of a jet aircraft roaring above could be roughly equivalent to, or even several decibels louder than, a noisy motorcycle heard at close range.³¹ An aircraft's footprint also varied depending on whether it was taking off or landing. Generally speaking, departing planes produced a noise contour, or area of emission, that was long and intense and grew progressively wider as an aircraft climbed. On the other hand, arrivals generated a shorter, narrower footprint that produced less noise across a smaller area.³² Aircraft generated maximum noise levels during runway acceleration and the take-off and climb.³³ Equally significantly, people hearing this noise from the ground inevitably had different reactions depending on the plane's trajectory and their position relative to it. For example, a location underneath an aircraft flight path generally produced more sustained noise than a position off to the side.³⁴ The emergence of these varied and complex aircraft-generated noise contours ultimately formed the backdrop for escalating citizen complaints by the late 1960s. They also complicated official strategies to categorize and identify patterns. In the end, noise brought into greater focus the changing relationship between modern airports and their surrounding environments.

Noise became an especially pressing issue in Vancouver once the government decided to expand the city's airport in February 1973. Like other major airports in Canada, Vancouver International Airport had grown rapidly throughout the 1960s and early 1970s.³⁵ Between 1965 and 1972, passenger traffic increased threefold and aircraft movements more than doubled, statistics that made it Canada's busiest airport in terms of aircraft movements and third busiest in terms of passenger traffic.³⁶ In 1972, 3.2 million passengers passed through the airport.³⁷ Based on these numbers, the

30 McGrath, *History of Canadian Airports* (fn. 10), pp. 55-56.

31 Michael Smith, *Aircraft Noise*, Cambridge 1989, p. 9.

32 *Ibid.*, pp. 271-272.

33 Keith Attenborough/Oleksandr Zaporozhets/Vadim Tokarev (eds), *Aircraft Noise. Assessment, Prediction and Control*, New York 2011, p. 4.

34 Smith, *Aircraft Noise* (fn. 31), p. 241.

35 Much of this growth stemmed from Vancouver's role both as a national hub and an international gateway to the Pacific Rim. Moreover, it was also the headquarters for Canadian Pacific Airlines, one of Canada's two major airlines at the time, which gave it special national clout.

36 City of Vancouver Archives, W.L. Inglis fonds, Airport statistics folder: 550-A-3, file 3, >Vancouver International Airport – Air Traffic<.

37 City of Vancouver Archives, Community Forum on Airport Development fonds, Airport Planning Committee 1973–1976 folder: 579-A-1, file 2, >Transport Canada, Vancouver International Airport Proposed Expansion, 1973: Public Information Kit, Acquisition of Land<. In 1972, the Canadian government forecasted that the airport would serve 6 million travellers by 1980, 8.5 million by 1985, and 11.5 million by 1990. These estimates proved to be slightly high; in 1989, the airport served more than 9 million passengers. See McGrath, *History of Canadian Airports* (fn. 10), p. 245.

Canadian government decided to expand the airport and announced a plan that involved the expropriation of 1,400 acres of land on Sea Island, where the airport was located, to build a new parallel runway.³⁸

The Canadian government and planners characterized the airport's expansion as people-friendly, claiming a new runway would not mean more noise and other nuisances for local residents.³⁹ To defend their position they relied on a new international noise methodology known as the Noise Exposure Forecast (NEF), which they heralded as the product of years of research around major airports in Europe and North America.⁴⁰ The NEF was a composite of existing measurement units, like the perceived noise decibel unit and the effective perceived noise decibel unit, as well as other sociological variables tied to expected individual behaviour and response to noise.⁴¹ The government declared that the NEF was the most effective measurement tool for measuring and summarizing noise from any aircraft operating on a runway and would permit planners and engineers to predict the annoyance to the average individual caused by flight operations at an airport.⁴²

Nevertheless, the government failed to demonstrate much sensitivity to individual listener reactions in that it used the NEF to construct a noise airspace around Vancouver and other Canadian airports to predict general responses to aircraft noise. This noise airspace contained four contours that were grouped by intensity level and the likelihood of neighbourhood mobilization, ranging from the below 30 NEF contour, the area with the lowest projected noise levels, to the over 40 NEF contour, the

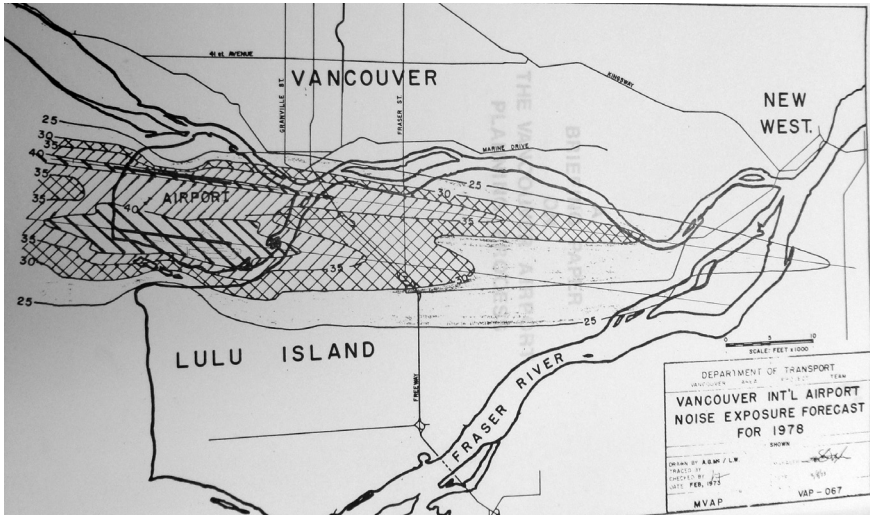
38 Ross, *Richmond* (fn. 23), p. 177; Feldman, *The Politics of Canadian Airport Development* (fn. 24), pp. 122-124. The government also announced that six homes in the Burkeville subdivision, located east of the airport on Sea Island, would be expropriated to upgrade the Hudson Street Bridge connecting the airport and Sea Island to Richmond and downtown Vancouver. See City of Richmond Archives, Series 17, File 2606-2, Vancouver International Airport Planning Committee final report, March 1976. The government had actually begun to expropriate homes in the late 1960s in preparation for expansion. See City of Richmond Archives, Series 17, File 2606-1, Transport Canada public information kit on Vancouver International Airport proposed expansion, 12 February 1973, p. 1 fact sheet. On the expropriation hearings, see Rick McGrath, Expropriation law leveled, in: *Richmond Review*, 7 March 1973.

39 In part, officials trumpeted the future arrival of quieter, larger planes like the Boeing 747 and the McDonnell-Douglas DC-10 that were expected to transport more people and produce a gentler acoustic footprint. These next-generation jet aircraft would eventually help phase out the aging, noisier models, such as the Boeing 707 and MD DC-8, which had been introduced in the late 1950s and were still in wide use. See City of Vancouver Archives, Community Forum on Airport Development fonds, Clippings 1973-1988 folder: 578-G-7, file 5, 'Noise no problem, airport foes told', *Vancouver Sun*, 12 February 1973.

40 For a technical overview of the NEF system, see Aeronautical Planning and Development Division, Civil Aeronautics, *NEF System User's Manual*, Ottawa 1977. The NEF was also in use in other places, such as the United States, at the time. See Gordon McKay Stevenson Jr., *The Politics of Airport Noise*, Belmont 1972, p. 19.

41 On the technical specifics of different noise measurement systems, see Smith, *Aircraft Noise* (fn. 31).

42 City of Vancouver Archives, Community Forum on Airport Development fonds, Airport Planning Committee 1973-1976 folder: 579-A-1, file 2, 'Transport Canada, Vancouver International Airport Proposed Expansion, 1973: Public Information Kit, Noise and the Environment.'



Noise contours around Vancouver airport. The contours are mapped in conical bands from left to right, with the contour numbers on the left.

(City of Vancouver Archives, Community Forum on Airport Development fonds, Airport Planning Committee 1973–1976 folder: 579-A-1, file 2, >Transport Canada, Vancouver International Airport Proposed Expansion, 1973: Public Information Kit, Noise and the Environment)

highest.⁴³ The higher the noise range, the more the government expected push-back from the public, ranging from few complaints in the below 30 NEF contour to >repeated and vigorous individual complaints are likely. Concerted group and legal action might be expected< in the over 40 NEF contour.⁴⁴ In other words, officials sought to predict where noise complaints were most likely to occur by redefining local areas as a series of noise pockets. In the process, they effectively made the noise complaints that originated in areas outside the highest contours appear less legitimate by virtue of where they occurred.

The government had a more extensive noise abatement approach in Vancouver than anywhere else in the country, in no small part because it was trying to sell airport expansion to an increasingly sceptical public. One feature of this approach was data collection and statistical analysis. In 1973, shortly after announcing the expansion plan, the government awarded a contract to the firm Acoustical Engineering to measure noise at twenty-two locations across the Greater Vancouver area, most of which were close to the airport or under or near its flight paths. Acoustical Engineering used noise-monitoring

43 Aviation Planning and Research Division, Civil Aviation Branch, Canadian Air Transportation Administration, *A Description of the CNR and NEF Systems for Estimating Aircraft Noise Annoyance*, Ottawa 1971.

44 *Ibid.*, p. 38.



Acoustical Engineering employee measures aircraft noise on top of mobile ›Noise Measurement Vehicle‹ near Vancouver International Airport, 1973. (City of Vancouver Archives, Community Forum on Airport Development fonds, Clippings 1973–1988 folder: 578-G-7, file 5, Vancouver Sun, n.d.)

equipment that was housed in mobile units at each of the sites to compile the data, which was then sent to the National Research Council of Canada for analysis.⁴⁵ The units contained recording and radio communication systems connected to two microphones as well as a wind direction and velocity indicator positioned outside.⁴⁶ The results of these tests were not what the government had hoped for; preliminary results showed high and potentially hazardous readings in Richmond underneath or adjacent to aircraft departures and landings.⁴⁷

Canadian authorities took other steps to convince residents that they cared as much about noise concerns as they did about modernizing airports to stimulate further growth. In 1974, a 24-hour telephone complaint service was established in Vancouver, the first for a Canadian airport.⁴⁸ Residents in the Greater Vancouver area affected by aircraft noise could call the service and register their concerns. The government pledged that complaints would be ›followed up by appropriate action‹, which could include flagging for air traffic controllers any aircraft that were flying below regulated altitudes and thereby generating higher noise levels. In the first four months, the service received nearly 800 complaints.⁴⁹

45 On the National Research Council of Canada's role in this project and specific findings, see J.E. Piercy/T.F.W. Embleton, *Effect of Weather and Topography on the Propagation of Noise: Vancouver Airport*, Ottawa 1974.

46 The recording system tabulated the data and the radio kept the monitoring station operator in touch with aircraft movements at the airport to ascertain the type and size of the aircraft responsible for specific noise measurements.

47 City of Vancouver Archives, Community Forum on Airport Development fonds, Clippings 1973–1988 folder: 578-G-7, file 5, *Vancouver Sun*, 27 October 1973.

48 People could call an existing number to make noise complaints, but the Community Forum on Airport Development applied pressure on authorities to upgrade it, claiming that evening calls were not being logged and creating incomplete and unreliable data in the process. See John Cosway, Noise objectors want night line, in: *Richmond Review*, 3 April 1974, p. 1.

49 City of Vancouver Archives, Community Forum on Airport Development fonds, Airport Planning Committee 1973–1976 folder: 579-A-1, file 2, ›Airport Planning Committee News: ›Sounding Off About Noise‹‹.

In 1975, the government also issued a pamphlet about noise specifically for the Greater Vancouver area. Entitled ›Sorry About The Noise‹, the pamphlet acknowledged the pervasiveness of aircraft noise in and around the city and sought to assure concerned residents that the government had a mitigation plan in place.⁵⁰ However, it also contended that much of the generated noise was tolerable to the average person, displaying little interest in acknowledging the possibility that individual reactions to sound might vary. And while the pamphlet respected the fact that public reactions to noise were inherently subjective, it did so only to highlight the difficulty in formulating a policy response to capture the broad spectrum of reactions. ›In effect‹, one section read, ›one man's sound is another man's noise, and there are no constants in the »taste« or reaction to sound. No one is yet able to tell us what is »acceptably quiet«.⁵¹ This rhetoric underlined the fact that Canadian authorities recognized the subjectivity of noise, but embraced a pro-development framework anyway, taking steps to convince the public that some noise was all but inevitable around airports for the foreseeable future. As such, they effectively endorsed a future vision of air travel that normalized aeromobile sprawl.

3. ›Planes Are Coming In Every Three Minutes‹: Local Critiques of Aeromobile Sprawl

In Vancouver, homeowners affected by noise and other airport expansion opponents quickly challenged the state's techno-scientific logic. They did so by offering a critique of progress that mirrored the rhetoric of civic resistance movements that emerged across Canada and the United States during the 1960s and 1970s in response to unwanted local development projects.⁵² Theirs, however, was especially geared around an embodied response to recent changes in and around their neighbourhoods. To quote historian Joy Parr, technological change, such as alterations in sound, can fundamentally alter a person's lived experience by ›disordering their material reference points [...] [that] made the rhythms of habitat the rhythms of self – by extension incorporating the reckonings of distance, depth, duration, and direction – and situated people in

50 City of Vancouver Archives, Community Forum on Airport Development fonds, Greater Vancouver Citizens' Committee on Noise Abatement, 1973–1976 folder: 579-A-6, file 5, Ministry of Transport Noise Information Pamphlet, 1975, front page of pamphlet.

51 *Ibid.*, second page of pamphlet.

52 Much civic resistance was directed towards so-called urban renewal projects. See for example Danielle Robinson, *Modernism at a Crossroad: The Spadina Expressway Controversy in Toronto, Ontario ca. 1960–1971*, in: *Canadian Historical Review* 92 (2011), pp. 295–322.

their habitat.⁵³ In this way, aggrieved suburban homeowners and their supporters offered a sensory critique of aircraft noise based on the threat it posed to individual notions of place and identity.

Class also shaped the level of resistance in Vancouver to noise and airport expansion. The epicentres for suburban protest in the city were South Vancouver and Richmond, located north and south of Sea Island, the site of the airport, respectively. Residents in these neighbourhoods were not only exposed to some of the most frequent and intense aircraft noise, but also generally earned more than others living nearby and had higher than average incomes for the city overall.⁵⁴ This gave them enough socio-economic clout to wage a very public, and prolonged, battle against noise and airport expansion. As in these other movements, residents in South Vancouver and Richmond were able to take concrete steps – like creating and distributing literature, lobbying politicians, hiring lawyers and specialists, and reaching out to like-minded groups across the country and continent – that generated more public interest in, and sympathy for, their cause.⁵⁵ Simply put, many of these homeowners could afford to invest a significant amount of time and resources opposing the airport's expansion, a privilege that greatly helped to transform jet-age noise into a public issue in Vancouver.

The anxiety about noise was part of a larger suburban critique that drew on many languages, including that of postwar environmentalism. Led by the Community Forum on Airport Development (CFAD), a coalition of ratepayers' organizations that formed in Vancouver in 1973, many activists drew from this rhetoric to highlight the ecological impact of aeromobile sprawl and predict negative changes to the nature and order of ecosystems around the airport if it was expanded.⁵⁶ For example, the CFAD argued that expansion would severely disrupt the nearby Fraser River estuary, an ecologically sensitive area with a large bird and wildlife population that sat directly in the path of the new runway.⁵⁷ It also pointed to a 1974 study by the Canadian Wildlife Service, which concluded that in the event of expansion, between 15 percent and 100 percent of the existing foreshore habitat would be lost, including between 800 and 5,500 ducks and geese, 200 and 1,400 shorebirds, and 60 and 400 gulls and

53 Joy Parr, *Sensing Changes. Technologies, Environments, and the Everyday, 1953–2003*, Vancouver 2010, p. 129.

54 1971 Census of Canada, Statistics Canada. Information here is specifically drawn from a map published in the *Financial Times* in 1975 that geographically represented the census data for Vancouver in terms of average household income.

55 Steve Penfold, 'Are we to go literally to the hot dogs?' Parking Lots, Drive-ins, and the Critique of Progress in Toronto's Suburbs, 1965–1975, in: *Urban History Review* 33 (2004/05), pp. 8–23.

56 On the rise of postwar environmentalism in North America, see Ryan O'Connor, *First Green Wave. Pollution Probe and the Origins of Environmental Activism in Ontario*, Vancouver 2015; Christopher Sellers, *Crabgrass Crucible. Suburban Nature and the Rise of Environmentalism in Twentieth-Century America*, Chapel Hill 2012.

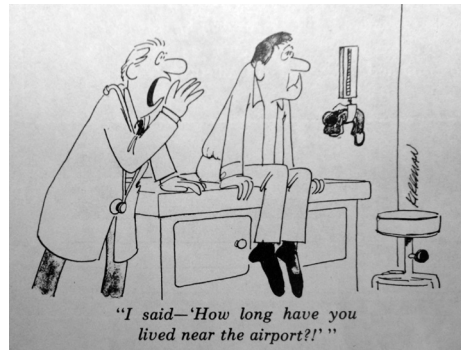
57 City of Vancouver Archives, Community Forum on Airport Development fonds, Clippings 1973–1988 folder: 578-G-7, file 5, 'Bigger airport »could imperil wildlife«, *Vancouver Sun*, n.d.

seabirds.⁵⁸ This stance represented a different understanding of the place of airports in local geographies, one that challenged the state's interest in airports that had helped make aeromobile sprawl possible.

Alongside these concerns, however, affected citizens and airport expansion opponents most frequently cited noise as a growing socio-environmental nuisance and a clear reason why the airport should not be expanded until a satisfactory local resolution could be found. Their concerns were not new, having often been raised during the 1960s. In 1963, Richmond resident Robert Zarelli claimed that his house walls and stucco were cracked from what he described as constant jet noise overhead: ›Planes are coming in every three minutes. We can't watch television and we have to scream at each other to be heard.‹⁵⁹ And in 1969, D.B. Henning, another Richmond homeowner, declared that rising noise from aircraft take-offs and arrivals as well as ground engine testing had deprived him of much peace and quiet. ›I consider life in general pretty grim‹, he wrote, ›if we all followed the example of the airports' disregard of the common environment.‹⁶⁰

As these examples show, many people became annoyed with aircraft noise mainly because it disrupted daily routines and interactions. For them jet-age noise was an environmental nuisance that comprised their sensory landscape. Provincial and local media were quick to grasp this point as more people spoke out, and regularly satirized the issue in cartoons and comics while also acknowledging its seriousness for homeowners. One cartoon, for example, showed a doctor addressing a visibly rattled patient who had suffered hearing loss from aircraft noise. Newspapers also often printed pictures of aircraft flying low over neighbourhoods that visually explained the nature of the problem to readers.⁶¹

Local noise complaints also focused on perceived flaws in the government's noise mitigation strategy, particularly its reliance on the NEF system. In a 1974 position paper, the Greater Vancouver Regional District (GVRD) blasted the NEF's schematics, calling it a ›faulty‹ methodology



Jet-age noise and its effects – a recurring cartoon theme (City of Vancouver Archives, Community Forum on Airport Development funds, Clippings 1973–1988 folder: 578-G-7, file 5, Vancouver Sun, n.d.)

58 E.W. Taylor, *The Vancouver International Airport Expansion Proposals and Possible Impact on Wildlife of the Fraser River Estuary*, Delta 1974, pp. 35-37.

59 [No author,] Jets shatter walls, nerves, in: *Richmond Review*, 6 June 1963, p. 1.

60 D.B. Henning, Letter to the Editor, in: *Richmond Review*, 8 October 1969, p. 17.

61 See for examples City of Vancouver Archives, Community Forum on Airport Development funds, Clippings 1973–1988 folder: 578-G-7, file 5.

for measuring noise that contained ›systematic biases in calculation methods‹ and vastly underestimated the ›extent and seriousness of noise exposure from airport and aircraft operations‹ in Vancouver.⁶² Other public responses focused on the ramifications of the government's noise methodology. The CFAD accused authorities of ›lowering the quality of life for everyone in order to make travelling more convenient for a few‹, saying that this ›amount[ed] to dictatorship by the minority‹. It went on to add: ›[they] treat Vancouver as an air-conditioned city where people sit inside their houses with all windows closed. Because this is an unrealistic view of the habitat and habitants, what other erroneous assumptions have been made?‹⁶³ Comments like these linked the NEF system to pro-growth ideology and stressed that where airport development was concerned, technocratic logic should not trump local realities.

This is not to say that homeowners had the entire public on their side. In fact, there were some who questioned whether suburbanites were truly opposed to noise and airport development in principle or only because it was near their homes.⁶⁴ In some cases, people in these neighbourhoods even made this point. ›It's not unliveable [the noise from aircraft]‹, observed George Fierheller, a resident of Point Grey, a neighbourhood in South Vancouver and one of the hotspots for noise complaints. ›I think people who live close to airports have to be realistic, and accept some noise.‹⁶⁵ Fierheller essentially asked whether community activists had come to expect too much from airports within a neighbourhood setting when in fact they had only themselves to blame for choosing the suburban life and settling near an airport in the first place.

What complicated this argument, however, was the fact that suburbanization in Canada had largely preceded jet-age noise and aeromobile sprawl. Even after airport modernization had begun to encroach on surrounding communities, blaming residents for reacting angrily ignored the government's role in failing to slow postwar development around airports. Captain Charles Simpson, President of the Canadian Air Traffic Controllers Association in the early 1970s, recognized this fact: ›People who moved close to an airport after it was built, and who are now complaining about the noise, should never have been allowed to move there. Governments should have bought up the surrounding land for industrial uses, which aren't bothered by the noise.‹⁶⁶ Simpson's remarks provided further proof of the fact that noise, and aeromobile sprawl generally, was a publicly divisive issue. While some had no sympathy for

62 City of Vancouver Archives, Community Forum on Airport Development fonds, Greater Vancouver Regional District and Airport Expansion, 1973–1979 folder: 579-A-6, file 6, ›GVRD Position Paper, 17 October 1974‹.

63 City of Vancouver Archives, Community Forum on Airport Development fonds, Airport Alert, 1981 folder: 578-G-7, file 3, ›Community Forum on Airport Development Newsletter, November 1981‹.

64 This position was widely dubbed Not In My Backyard, or NIMBY, Syndrome in the 1980s. The phenomenon is briefly discussed in Harris, *Creeping Conformity* (fn. 18), pp. 36–37. On the rise of NIMBYism in the United States, see Gregory E. McAvoy, *Controlling Technocracy. Citizen Rationality and the NIMBY Syndrome*, Washington 1999.

65 City of Vancouver Archives, Community Forum on Airport Development fonds, Clippings 1973–1988 folder: 578-G-7, file 5, ›Airport noise level tortures residents under flight paths‹, *Vancouver Sun*, n.d.

66 *Canadian Aviation*, January 1971, p. 42.

upset homeowners, others, like him, blamed the state for the noise problem and argued that authorities could have done more to protect people from airports at a time when aviation was rapidly growing nationwide and around the world.

Civic concerns about the socio-environmental costs of jet and other aircraft noise soon extended beyond daylight hours. Until 1978, the vast majority of airport operations at Vancouver airport, including departures and arrivals, had occurred between 7am and midnight.⁶⁷ Beginning in June 1978, however, overnight, or 'nighthawk', flights began operating at the airport, leaving Vancouver as the only Canadian international airport without a nighttime curfew.⁶⁸ Although the government and Vancouver airport's managers did impose restrictions on the nighthawk flights that were approved, the new program still meant a dramatic increase in the number of overnight flights.⁶⁹ From only five nighthawk flights in July 1976, officials authorized 153 in 1978 and 566 in 1979, as more Canadian airlines and European charter companies took advantage of the overnight opportunities at Vancouver.⁷⁰

The rise of nighthawk flights at Vancouver led expansion opponents and noise sceptics to broaden their concerns about the local effects of aircraft noise and automobile sprawl. Aggrieved homeowners and other critics had focused on the daytime effects of aircraft noise on people's hearing and daily routines. However, nighthawk flights were especially dangerous because they could potentially disrupt sleep patterns and cause more acute psychosomatic distress. To make their case, activists turned to experts for help, seeking out specialists in Canada who had begun to study the physiological and psychological effects of aircraft noise on affected populations.⁷¹ This collaboration, in turn, brought greater nuance to the arguments of noise sceptics and anti-expansion people by exploring the possible mental health threat that overnight aircraft noise posed.

67 This schedule was the product of a 'gentleman's agreement' arranged in the 1960s between the two major Canadian airlines – Air Canada and Canadian Pacific Airways – and a host of smaller, regional airlines to avoid scheduling departing or arriving flights at airports across the country between midnight and 7am as a way of reducing noise complaints.

68 Nighthawk flights were attractive to air carriers because they avoided the maintenance costs of having to ground their planes for several hours overnight. On this point, see Rigas Doganis, *Flying Off Course. Airline Economics and Marketing*, 4th ed. New York 2010, introduction. Montreal-Dorval and Toronto had both instituted curfews in 1978 and 1979 respectively. See City of Vancouver Archives, Vancouver Councillor's Office, Alderman Helen Boyce fonds, Vancouver Airport, 1977–1980 folder: 84-F-3, file 9, G.F. Farry, Chief Administrator Planning, to Chairman and Members of the Planning Committee, Re: Night Flying at Vancouver Airport, 20 March 1980.

69 In particular, officials restricted the use of power reverse thrust – a typically noisy manoeuvre – overnight. Power reverse thrust temporarily diverts the aircraft's engine exhaust forward, rather than backwards, to produce deceleration. It is usually applied just after an aircraft has landed in order to help slow it down more rapidly and reduce wear on the brakes.

70 City of Vancouver Archives, Community Forum on Airport Development fonds, Clippings 1973–1988 folder: 578-G-7, file 5, *Express Finance*, 20 June 1979.

71 This followed pioneering studies in the early 1970s that blamed jet noise for irregular sleeping patterns and a disproportionately high number of infant deaths in communities near Los Angeles International Airport and London's Heathrow International Airport. On the London sleep studies, see Smith, *Aircraft Noise* (fn. 31), p. 17.

Specialists who studied the Vancouver situation pointed out that the federal noise abatement strategy may have actually complicated the means of accumulating knowledge about the overnight effects of aircraft noise on populations. In the late 1980s, the CFAD hired Dr. James Piercey, who was affiliated with the National Research Council of Canada, to study Transport Canada's NEF-based noise analyses at and around Vancouver airport. Piercey concluded that the impacts of aircraft noise on sleep and speech interference had been understated and recommended a full community survey with a greater built-in cognitive and psychological focus.⁷² He also called for the introduction of a noise compensation project for affected residents. Through this program, Transport Canada would compensate homeowners who wished to insulate their homes from noise through wall treatment, glazing, heavier roofs, solid core doors, or air exchange or air-conditioning systems, all of which would help make neighbourhoods surrounding the airport more habitable.⁷³

Others also highlighted the possibly harmful physiological and psychological effects from noise that was not readily audible. In 1991, Paul Wolstenholme, a professor in the Department of Communications at Simon Fraser University in Vancouver, argued that the impact of infrasound and very low-frequency noise from aircraft traffic was as injurious to affected residents as the more common high-frequency sounds. Jets, he claimed, emitted extraordinarily high intensity levels of infrasound, particularly during take-off and subsequent turning climb manoeuvres as the aircraft ascended towards its assigned flight path. These were mostly emitted rearward, meaning that neighbourhoods typically located away from the noisier flight paths could be adversely affected. Moreover, Wolstenholme argued that wide-body jets that had been introduced into service during the 1970s and 1980s, generally thought to be quieter and more noise-friendly than their predecessors, were actually the biggest offenders in terms of low-frequency emissions.⁷⁴ According to him, people exposed to such emissions experienced general discomfort and difficulties performing cognitive tasks and, as intensity increased, feelings of nausea, headaches, dizziness, oppressiveness, fear,

72 City of Vancouver Archives, Community Forum on Airport Development fonds, Airport Current, 1989–2000 folder: 579-A-6, file 7, letter to Ray Robinson, Chairman, Vancouver International Airport Environmental Assessment Panel, 21 January 1991, p. 1.

73 *Ibid.*, p. 3. Interest in noise compensation projects continued into the 1990s as a solution for placating residents if noise mitigation strategies were deemed to have failed. Other options floated at the time included relocation assistance; a house sale value guarantee; house insulation for people who wished to stay in their homes; insulation of local churches, schools, community and recreation centres, old age homes and vulnerable industries; community betterment programs; and annual tax rebates.

74 By the 1980s, a common industry argument was that continuing advances in jet technology had begun to mitigate aircraft noise in local communities and, by extension, to decrease the number of noise complaints, rendering the noise problem an individual, rather than collective, issue. See City of Vancouver Archives, Community Forum on Airport Development fonds, Community Reports, 1989–1990 folder: 579-A-7, file 3, Vancouver International Airport, Parallel Runway Project, Community Report, Volume No. 2, 1990.

lethargy, and loss of balance.⁷⁵ Failure to substantially reduce aircraft noise and low-frequency emissions would lead, Wolstenholme believed, to extensive damage to emotive and neural capabilities that could cause people to be ›increasingly neurotic, psychotic, indulging in violent, vandalistic, anti-social, and essentially self-destructive‹.⁷⁶ While this description was undeniably dystopian, it illustrated not only that civic concerns about jet-age noise in Vancouver remained strong past the 1960s and 1970s, but also that these critiques had become more refined as general societal awareness about noise had grown over this period.

4. Mega-Airports and More Aeromobile Sprawl

As people in Vancouver protested against noise around airports, the Canadian government had already pivoted elsewhere to a new airport planning strategy that it felt would minimize future problems between airports and communities. By the early 1970s, it had decided to build new mega-airports in Montreal and Toronto, envisioning that they would be located further away from populated areas and thus not only have a lighter social and environmental impact, but also face fewer obstacles to expansion when this became necessary.⁷⁷ Nevertheless, the concept of moving airports away from communities and built environments did not lessen aeromobile sprawl. Rather, the size of the new mega-airports, only one of which was eventually built, and the government's decision to create the necessary space for them actually generated *more* local disruption in different ways. In other words, although built on enormous tracts of land to avoid a repeat of events in cities like Vancouver, mega-airports had a specific, and wide-ranging, local socio-environmental impact precisely because they were planned on such a large scale.

The government announced new airports for Montreal and Toronto in 1969 and 1972 respectively.⁷⁸ Other cities, like Vancouver, did not get a second airport because the government felt that expanding the existing airport would be enough to meet current and forecasted growth. Officials had also considered expanding Toronto-Pearson and Montreal-Dorval, but a variety of factors, including optimistic air traffic forecasts and local anti-expansion sentiment, convinced officials to build massive new airports

75 City of Vancouver Archives, Community Forum on Airport Development fonds, Airport Current, 1989–2000 folder: 579-A-6, file 7, Paul Wolstenholme, ›Impact of Infrasound and Very Low-Frequency Noise from Traffic on the Proposed Third Runway at Vancouver International Airport, January 1991‹, p. 1.

76 *Ibid.*, pp. 14-15.

77 On the government's specific planning vision for Mirabel, see Bret Edwards, *Breaking New Ground: Montreal-Mirabel International Airport, Mass Aeromobility, and Megaproject Development in 1960s and 1970s Canada*, in: *Journal of Canadian Studies* 50 (2016), pp. 5-35.

78 Montreal-Mirabel International Airport was announced in late March 1969 and Pickering International Airport (Toronto's new airport) in early March 1972.

in each city that would be larger than any other airport in the country and, in Mirabel's case, the world.⁷⁹ Authorities were particularly drawn to the idea of mega-airports because it freed them from many of the challenges they had begun to face with existing airports, namely those involved in enlarging them within settled areas. Canadian airport planner W.H.S. Neales summarized the situation in 1972: >In the Canadian setting [...] [we must] take into account the fact that most regions of the country have existing airports which [...] have served us well, but within the operational criteria applicable at the time of the site selection. In addition, zoning bylaws, or maybe more accurately the lack of them, have permitted developments which are not compatible with airport operations, and have imposed new limitations on the continued or expanded development capability.⁸⁰ In other words, for their proponents the appeal of mega-airports lay in their unrestricted growth potential. If built away from subdivisions and other built landscapes, mega-airports would have the necessary land and space to swiftly expand without interfering with local communities as had happened in Vancouver. Authorities and planners thus returned to the old notion that airports had to be isolated to function best in the jet age.

In March 1969, the government selected Sainte-Scholastique, fifty kilometres northwest of downtown Montreal, as the site for what would become Mirabel International Airport.⁸¹ Soon after, it expropriated 97,000 acres to build the airport as well as permit future expansion and facilitate ancillary development on site; never before had so much surplus land been seized for an airport in Canada.⁸² The move affected 10,000 people, with some forced to leave their homes immediately and others staying on as tenants until the government needed the land.⁸³ At its completion, officials and planners envisioned that Montreal-Mirabel would have six runways, six air terminals, and a total of 150 gates, projecting that the airport would handle more than twenty million passengers annually by 2000, which reflected their optimistic growth forecasts at the

79 Government studies projected annual growth rates of nearly 8 percent at Montreal-Dorval and between 6 percent and 10 percent at Toronto-Pearson. See McGrath, *History of Canadian Airports* (fn. 10), p. 154; Government of Canada, *People and the New Toronto Airport*, Ottawa 1972, p. 7.

80 W.H.S. Neales, Decision-Making in Airport Planning and Design, in: *Readings in Airport Planning. A Series of Lectures Presented by the Centre for Urban and Community Studies and the Department of Civil Engineering, University of Toronto*, Toronto 1972, p. 9.

81 Sainte-Scholastique had emerged the winner even though it was not the first choice of either the federal or the Quebec government. On the selection process, which I will not discuss here, see McGrath, *History of Canadian Airports* (fn. 10), pp. 154-156; Walter Stewart, *Paper Juggernaut*, Toronto 1979, pp. 25-34; and Suzanne Laurin, *L'échiquier de Mirabel*, Montréal 2012, pp. 111-118.

82 Roger Gosselin/Jean-Pierre Brassard, *Mirabel: Part II. Land Expropriation and Management*, Toronto 1977, p. 2. This act made Mirabel the largest airport in the world and many times larger than the next largest Canadian airport, Toronto-Pearson, which occupied only 4,000 acres. See *Globe and Mail*, 12 June 1972, p. 4.

83 The Mirabel expropriation order entailed the largest planned forced removal of people in Canada since the Acadian Deportations in the eighteenth century. See *Montreal Gazette*, 11 August 1970, p. 3. Officials planned several phases of airport construction, which explained why some residents could stay in their homes even after being expropriated. On local opposition to the expropriations, see Laurin, *L'échiquier de Mirabel* (fn. 81).

time.⁸⁴ The presence of a huge buffer zone around the airport also meant that it had no noise restrictions and could operate 24 hours a day. After significant cost overruns and delays, it opened in October 1975 at a total price tag of around \$4 billion.⁸⁵

In Toronto, Pickering, forty kilometres east, was selected as the new airport site.⁸⁶ Like Mirabel, officials wanted Pickering to be an unprecedentedly large airport and followed the same approach of expropriating a sizable amount of local land to build it. They set aside 18,000 acres for the airport itself, as well as another 25,000 acres south of the airport for a new city, the North Pickering Community, which was projected to grow to a population of 150,000 within twenty years.⁸⁷ As part of this, 2,500 people would be removed from what was now designated as airport land and another 4,000 would likely be affected by future airport development and noise.⁸⁸ Once fully developed, Pickering would have up to four runways and become the city's primary international air hub.⁸⁹ But this vision was never realized. In 1975, federal officials opted to shelve the project after the Ontario government withdrew its support for the airport.⁹⁰

Pickering's postponement did not mean that its local impact was negligible. Although Mirabel's socio-environmental footprint might arguably have been more significant because the airport was actually built, the Pickering airport project also had a major impact on local people and the wider landscape before the government froze the project.⁹¹ Before authorities reversed their decision on Pickering, local residents, a mixture of Toronto professionals, middle-class retirees, and local farmers, had mobilized to resist the airport, forming People or Planes (POP) in 1972.⁹² Like CFAD, POP was part of a new wave of civic groups in the 1960s and 1970s that had a strong environmental consciousness, and its critique of the airport reflected these concerns. In particular, POP called attention to the area's high-grade agricultural land, criticizing the government

84 Government of Canada, *Keeping Canada one step ahead. The New Montreal International Airport at Mirabel, Quebec*, Ottawa 1973, p. 14.

85 Pigott, *Gateways* (fn. 11), p. 100. The amount equates to \$17.6 billion in 2016 dollars.

86 This was in spite of the fact that officials had allegedly removed Pickering from early consideration because it did not meet most of the selection criteria. For a critical take on the Pickering site selection process, see Sandra Budden/Joseph Ernst, *The Movable Airport. The Politics of Government Planning*, Toronto 1973, pp. 95-133; Hector Massey/Charles Godfrey, *People or Planes*, Toronto 1972.

87 *Toronto Star*, 3 March 1972, p. 1. In 1971, the Ontario government had announced plans to create two new towns, Cedarwood and Brock, near Pickering. They proceeded to combine them to form the North Pickering Community after the airport was announced one year later. Ontario was also responsible for expropriating and developing the lands required for this project. See Jack Diamond/Barton Myers, *Pickering Impact Study, Volume 2: Study Report*, Toronto 1974, p. 16.

88 *Toronto Star*, 26 April 1972, p. 4; *Toronto Star*, 16 March 1974, p. B9.

89 Stewart, *Paper Juggernaut* (fn. 81), p. 79.

90 The Ontario government's withdrawal of support was significant because under the division of powers arrangement in Canada it was responsible for building and financing highway and road links to the airport. Its refusal to do so meant that the federal government would have had to take on these responsibilities itself, which would have considerably increased the project's total price. See *Toronto Star*, 11 July 1975, p. A3.

91 On Mirabel's socio-environmental impact, see Edwards, *Breaking New Ground* (fn. 77), pp. 22-27.

92 On the history of People or Planes and its anti-airport mobilization, see Massey/Godfrey, *People or Planes* (fn. 86).

for ignoring this fact and claiming that annual regional losses would exceed five million dollars if the airport went ahead.⁹³ The organization was extremely active from the beginning, creating its own newsletter, writing letters of protest to government representatives, and producing its own anti-airport film. In their writing, POP members stressed that a new international airport meant immediate, irreversible spatial change and an end to a bucolic way of life: ›That [a new airport in Pickering] would be a total disaster. Airports can't live with birds and any farmer knows that plowing and reaping brings birds. So if you are going to have an airport you will have to kill the birds [...] or change farming practices. The wheat he [a local farmer] grew was grown on land which he had worked up carefully over the past six years. It was good land because he spent money and time on cultivating, enriching, and keeping it clean.‹⁹⁴

In some respects, these words proved prophetic even though POP successfully contested the airport. Canadian writer Walter Stewart revisited Pickering in the late 1970s and saw an environment completely transformed. The government had expropriated houses on the airport site beginning in March 1973, and the airport's subsequent postponement meant that other nearby homes had either suffered a significant drop in property values or been abandoned entirely.⁹⁵ For Stewart, the landscape reflected a sense of frozen development. He characterized post-airport Pickering as a ›comfortable wasteland‹ of economic uncertainty, agricultural stagnation, and absence of community.⁹⁶ Whereas Pickering had been a ›lovely country, a land of rolling hills and magnificent maples, towering pines, lush cornfields and rows of apple trees [...] [with] some of the richest, as well as some of the prettiest, farmland in Canada‹, it had now fallen victim to rural blight because of the government's aborted development, becoming a place of ›dead and decaying houses and the dead and decaying dreams‹ as residents had either moved away or stopped caring for their expropriated properties.⁹⁷

What made the case of Pickering especially significant, then, for assessing the shifting impact of aeromobile sprawl in the 1970s was that an unbuilt airport could paralyze local development and impact communities and the environment in its own way. Even if unfinished, the particular nature of jet-age airport development meant that shelved projects left an ›unbuilt landscape‹ that could not easily be reversed, a fact that especially applied to enormous infrastructure projects like mega-airports.⁹⁸ Completed or

93 Budden/Ernst, *The Movable Airport* (fn. 86), p. 6. Other studies, including one by the Ontario Department of Agriculture in 1972, concurred, saying that the airport would eliminate 49,000 acres of prime agricultural land, as well as end production of 4 million quarts of milk a year, 375,000 pounds of pork and poultry, 300,000 dozen eggs, 45,000 bushels of winter wheat, 30,000 broiler chickens, and \$2.25 million worth of beef cattle. See *Toronto Star*, 29 November 1972, p. 49.

94 Massey/Godfrey, *People or Planes* (fn. 86), p. 44.

95 The government began mailing out settlement offers to expropriated homeowners in April 1973. See *Globe and Mail*, 14 April 1973, p. 11.

96 Stewart, *Paper Juggernaut* (fn. 81), pp. 7-15.

97 *Ibid.*, pp. 8-9.

98 ›Unbuilt landscape‹ as a concept refers to failed mega-projects that produce shifts in imagined geographies despite a lack of material change. See Jonathan Peyton, *Unbuilt Environments. Tracing Postwar Development in Northwest British Columbia*, Vancouver 2016.

scrapped, mega-airports wielded their own form of aeromobile sprawl, one that was just as disruptive for local communities and other environments as that at and around existing airports. Generally speaking, building mega-airports to separate airports and people only served to impact other people, places, and things in different and no less destructive ways. The government's shifting approach to airport development in the 1970s, then, produced multiple forms of aeromobile sprawl across the country, which had the effect of linking residents in places like Vancouver and Pickering who understood and experienced jet-age growth in similar socio-environmental terms.

5. Conclusion

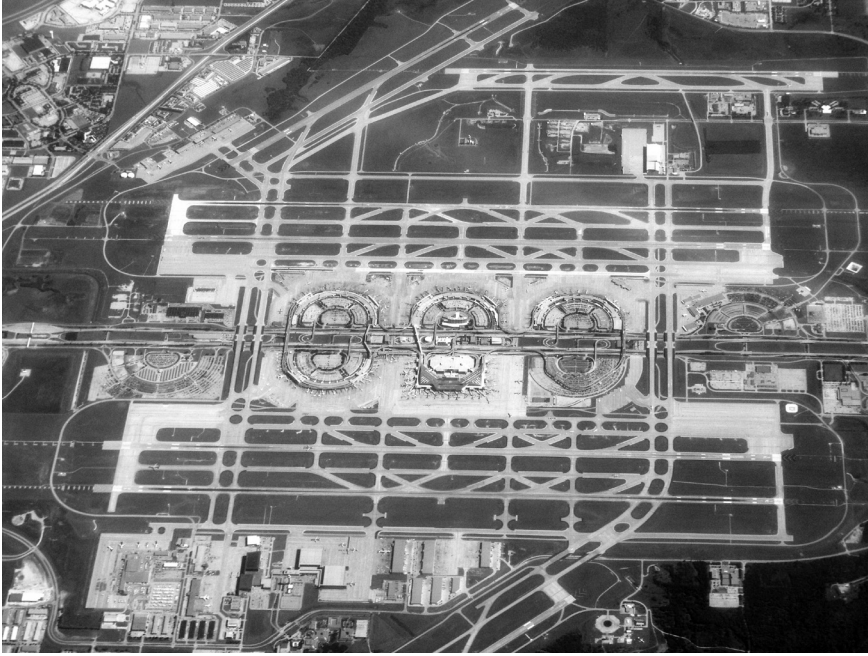
Aeromobile sprawl has remained a theme in recent years. Vancouver residents resisted the city's airport expansion into the 1990s, when the project was finally completed, and continue, along with other people across the country, to register noise complaints to this day.⁹⁹ And while Canada's mega-airport experiment has failed for now – Pickering remains mothballed and Mirabel closed down in 2004 – the former airport sites have yet to be redeveloped.¹⁰⁰ Across the world, meanwhile, mega-airports have emerged in the United States, Middle East, and Asia in the ensuing decades.¹⁰¹

These all involved significant land acquisition through government expropriation, some of which was designated for the airport proper and the rest for a buffer zone that would protect the airport from surrounding development and noise disputes. This suggested not only a broader trend in airport development, but also the normalization of aeromobile sprawl worldwide in the late twentieth century. As developments in Canada in the 1970s demonstrated, in spite of local resistance authorities and planners

99 For a recent example, see Susan Lazaruk, YVR [Vancouver International Airport] plans to use north runway this summer has residents airing complaints, in: *Vancouver Sun*, 12 May 2016.

100 On 13 June 2013 the Conservative federal government announced its intention to revive the Pickering airport project, referring to a 2011 Department of Transport study that concluded Toronto would need a second airport by 2027 to accommodate forecasted increases in air passenger traffic. For more details about the government study, see Wendy Gillis, Pickering a 'prime location' for new airport: Transport Canada, in: *The Star*, 11 July 2011. The Liberals defeated the Conservatives in the fall 2015 election and have not taken a clear position on the airport, leaving the project in limbo once again. Mirabel's closure can be explained by several factors: the government's failure to construct a rail link between Dorval and Mirabel, price increases and declining traffic volume as a result of the Energy Crisis, and changes to the country's bilateral agreements that allowed international airlines to land at Toronto for the first time. See Edwards, *Breaking New Ground* (fn. 77), pp. 27-28. On Mirabel as an abandoned site, see Liz Millward, Un aéroport-fantôme: The Ghost of Mirabel International Airport, in: Christina Lee (ed.), *Spectral Spaces and Hauntings. The Affects of Absence*, New York 2017, pp. 103-116.

101 Mega-airports that have opened since 1970 and sit on more than 8,000 acres include Dallas-Fort Worth International Airport and Denver International Airport in the United States, King Fahd International Airport in Dammam, Saudi Arabia, and Shanghai Pudong International Airport in Shanghai.



Overview of Dallas-Fort Worth International Airport, November 2007
(Wikimedia Commons, Todd MacDonald [<https://commons.wikimedia.org/wiki/File:DFWAirportOverview.jpg>], ›DFWAirportOverview‹, <<https://creativecommons.org/licenses/by/2.0/legalcode>>)

furthered the advance of aeromobile sprawl in different forms in order to stimulate more jet-age growth. In the process, their actions not only helped to show aviation's deepening social, environmental, and spatial impact in the jet age. They also confirmed that airports had come to function both as modern infrastructures of mobility and as shifting urban forms that by the late twentieth century could not easily co-exist with the wider natural and built landscape.

For additional images, see the internet version at
<<http://www.zeithistorische-forschungen.de/3-2017/id=5519>>.

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