**Air Traffic Control Newsletter #129**

**Perspective on Nav Canada's first 20 years | Pro and con arguments on ATC corporatization**



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**Perspective on Nav Canada's First 20 Years**

Editor's Note: Since a bill is about to be introduced in the U.S. House to convert the FAA's Air Traffic Organization into a federally-chartered, self-supporting, stakeholder-governed nonprofit corporation (inspired by the Nav Canada model), the following retrospective on Nav Canada's transition from a government agency may be of interest. John Crichton, founding CEO of Nav Canada, delivered this message to employees on the occasion of his retirement last month. The excerpts below are reprinted, with permission, from the December 2015 issue of*Nav Canada News*.

"On May 26, 1995, over 20 years ago, Nav Canada was incorporated as a private company.

. . . Prior to that, a consensus had been reached amongst the key stakeholders, including unions, that the service should be entrusted to a private, non-share capital corporation with stakeholder representation on the Board. . . . The negotiations, as we all know, were successful, and Nav Canada assumed ownership, operation, and control of the Canadian air navigation system (ANS) at midnight on October 31, 1996.

"The [transition] involved moving over 6,000 people out of a government department into a private company overnight. The vast majority of these people had never worked in the private sector, and all of them had been subject to a wage freeze of five-plus years, creating a major labor relations challenge. All collective [bargaining] agreements had to be renegotiated in two years.

"What about safety? Could a private company be trusted to run such a safety-sensitive system? . . . Could we reduce costs to our customers while improving service levels? There were major technology issues. Most of the air traffic management (ATM) systems and communications navigation, and surveillance (CNS) systems were old and in need of replacement. The CAATS project [counterpart to FAA's ERAM] was in serious trouble from the points of view of costs, schedule, and functionality . . . the only things that mattered for this kind of undertaking!

"The company also inherited a significant staffing shortage within the air traffic controller ranks, and it needed to rapidly stand up all new corporate services such as finance, human resources, information management, commercial relations, and the new office of safety and quality. . . .

"As we reflect today on all of those challenges, we should be extremely proud of what we have accomplished. The safety red herring has been laid to rest. The five-year rate of losses of separation between IFR aircraft is half of that while in government. Successful modernization programs have given Nav Canada people better and safer tools to work with. Safety oversight has been enhanced by separating the regulator and the operator. Nav Canada was the first ANS to introduce non-punitive reporting (or "just culture" as it is called today). I am convinced that safety is everybody's job every day at Nav Canada, and our results show it. International safety benchmarking studies show us leading the world.

"All our major ATM and CNS systems have been replaced or are about to be. CAATS was turned around and is now a world-leading flight data processing system. Numerous physical facilities have been replaced. Technology development was brought in-house, resulting in better products, faster, and at lower costs. Nav Canada and our people are world leaders in ATM science. We export our products around the world.

"Our labor relations climate is constructive and productive. There is mutual respect on both sides and a genuine attempt made by all parties to find solutions. Our employee population is smaller, but I believe more engaged and doing more meaningful work. Statistics Canada data from 2012 indicates that a large majority of Nav Canada employees are in the top 10% of wage earners in Canada.

"We have maintained AA credit ratings throughout our entire history. Our corporate bonds trade at the lowest spreads to government bonds of any private corporation. When we issue new debt the demand for it routinely exceeds supply by two or three times.

"Service levels to our customers have dramatically improved, and it is unusual to have significant delays in the system attributable to Nav Canada. The charges our customers pay to us are now about 35% less than the rate of inflation over the last 19 years. We have not had a rate increase in 11 years. Our debt profile is declining. We finance our capital spending out of cash flow. Capital spending at Nav Canada is half of that spent when in government, and we get three times the product twice as fast. Our own people build the systems in integrated teams—a world first in our business.

"How did we accomplish all this? We did it by working together and never losing faith in the belief that there was a better way. We did it by respecting each other and recognizing each of our unique talents and contributions. . . .

"I am now retiring as your President and CEO, and to say that I am proud of what all of you have accomplished would be an understatement of monumental proportions. You have made Nav Canada the most respected ANS in the world, and others are beginning to emulate us, the sincerest form of flattery."

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**Pro and Con Arguments Over ATC Corporatization Continue**

The rhetoric over converting the Air Traffic Organization into a nonprofit air navigation service provider (ANSP) continues to heat up, as the date nears for introduction of the House bill. Airlines for America and the Business Roundtable have been holding events and placing op-ed pieces in key media around the country, making the case for doing such a transition. Joining them recently has been former Sen. Byron Dorgan (D, ND), who in 2014-15 co-chaired the Eno Transportation Center working group on ATC reform. Dorgan had an op-ed in *The Hill* on December 16th making five positive points, including that the current ATC funding and governance model is broken, that independence of the ATO would strengthen the new ATC system, and that this would not be "privatization," a position I, too, have long maintained.

Former ATO Chief Operating Officer David Grizzle has likewise taken to the op-ed pages to make the case for corporatization—a position he shares with the other two former COOs, Russ Chew and Hank Krakowski. All three have been in the position of trying to run the ATO like a business, and all three concluded from their experience that it simply can't be done under the institutional constraints that the ATO is forced to operate under.

Op-eds by four airline executives in *Crain's New York Business* and by Grizzle in the *Miami Herald* both led to letters to the editor by Steve Brown, Chief Operating Officer of opponent NBAA (representing mostly business jets and turboprops). Both letters attempted to smear the U.K.'s NATS as an example of the bad things that can happen as a result of corporatization. First, Brown noted that a few months after its start-up, NATS lost money and eventually got a government bailout. What he left out was that the sudden large decrease in air traffic and revenue was due to the collapse of air travel (especially on the North Atlantic) in the aftermath of the 9-11 terror attacks, affecting all ANSPs in that market, including the FAA's ATO. Many governments, including ours, stepped in to aid private companies in the aftermath of 9-11.

Even more egregious was the following, which appeared in both of Brown's letters:

"Consider a report this year [2015] by the UK's own Airports Commission, which states that the system is 'showing unambiguous signs of strain,' producing 'more delays, higher fares, and reduced connectivity' at London's airports. Of course, the impact of the situation isn't limited to London. 'Another important consequence,' the Commission goes on to observe, 'is the decline of domestic services from other areas of the UK, particularly the North of England and Scotland, into the largest London airports, impacting the growth of their economies.'"

Sounds pretty damning, but since I have that report on my shelf, I re-read its executive summary and found that the quotes Brown cited were about the shortage of **airport capacity** in Southeast England. They have nothing to do with any lack of capacity or service by NATS, which Brown implied by writing this as part of his "snapshot of the UK's privatized ATC system." If NBAA has to make things up, it must realize that its case against reform is pretty thin.

Then there is the odd man out among airlines, Delta. The captive audience of the airline's passengers are this month treated to CEO Richard Anderson's defense of the status quo, "The System Is Working," in the January issue of *Delta Sky* magazine. In addition to the usual Delta claim that corporatization would disrupt implementation of NextGen, Anderson also makes the bizarre statement that "Last year I traveled to [Nav Canada's] headquarters to see if that kind of system would benefit the United States, and I didn't see anything to convince me that privatization [sic] would reduce costs for travelers. I came back with zero data showing operational efficiency or improvements as a result of privatization." Well, I made that same trip in December 2014, and came back with detailed facts and figures on the enormous improvements that corporatized Nav Canada has made in its two decades of existence. (See also the lead article in this newsletter, by outgoing CEO John Crichton.)

What I find heartening in recent weeks is signs of change in the general aviation community. A case in point is an editorial in the December issue of *Business & Commercial Aviation*, by Editor-in-Chief William Garvey ("Northern Exposure: Worth a Closer Look"). He devotes much of the piece to the history of Nav Canada, and the improvements it has made to ATC in Canada. He also cites Rudy Toering, the CEO of the Canadian Business Aviation Association (CBAA), the counterpart of our own NBAA. Toering tells Garvey that Nav Canada "has turned into a little bit of a jewel for Canada," that its ATC fees are among the lowest in the world, and that "we haven't had a rate increase in nine or ten years." Garvey concludes that, "As the debate heats up on ATC reauthorization, the actual Canadian experience regarding business and general aviation should be part of the deliberation."

Another encouraging straw in the wind is an op-ed that appeared January 18th in *The Hill*: "No Reason to Stall." The authors are Rep. Sam Graves (R, MO) and Todd Rokita (R, IN), both of whom are members of the House General Aviation Caucus. They are very clear that "the status quo is not working, and with each blunder by the FAA it becomes more apparent that the agency is simply not capable of implementing NextGen on its own. It's time for a better approach." While underlining their opposition to per-transaction user fees for general aviation, they report being positively engaged "in discussions on transitioning air traffic control responsibilities from an ineffective federal bureaucracy to a user-funded, user-governed, not-for-profit organization, all in a manner that protects the small aircraft operators and private pilots who use the system."

That's what Nav Canada has done. And I see no reason why we can't do likewise here.

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**GAO Documents Negative Impacts of Funding Uncertainty**

Uncertainty in federal funding has caused serious problems for FAA, and especially for modernization of the ATC system. That's the finding of a new report from the Government Accountability Office, released on December 8th. "Aviation Finance: Observations on the Effects of Budget Uncertainty on FAA" (GAO-16-198R) was requested by the House Aviation Subcommittee. They asked GAO to document and quantify, where possible, how uncertain funding has affected FAA operations and the NextGen modernization program. Those uncertainties include an authorization lapse in 2011 that resulted in $400 million less aviation excise tax revenue than expected, the 23 extensions (of from one week to six months) prior to the 2012 reauthorization, and the March 2013 sequestration, which led to furloughs of controllers, closure of the controller training Academy for nearly a year, and the threat to shut down 149 contract towers.

The shut-down of the Academy resulted in only 554 new controller hires in 2013, compared with a planned 1,315, which has led to today's shortfall of 820 controllers that is plaguing busy ATC facilities. The impact on NextGen has been profound, including a delay in even making the decision to invest in DataComm for en-route airspace (where it offers the greatest benefits), with only a modest number of control towers getting this upgrade over the next several years. Likewise, various tools needed for Performance-Based Navigation (PBN) have been delayed or put on incremental implementation schedules, meaning full PBN benefits are still years away. Also delayed to some uncertain time in the future are two planned improvements to aviation weather data—Common Support System-Weather (CSS-Wx) and NextGen Weather Processer (NWP). All these delays and uncertainties not only push projected benefits a lot farther into the future; they also decrease aviation user support for NextGen.

In response to the Subcommittee's question about alternative funding and budget options, GAO suggested direct ATC charges rather than appropriated tax money, bonding a user-charge revenue stream the way airports routinely do, and restructuring the Air Traffic Organization to be more like its many ANSP counterparts in other countries that are self-supporting from ATC fees and charges.

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**New CANSO Report Measures ANSP Productivity**

Air traffic control is a high-tech service business paid for either directly or indirectly by its aviation customers. It is therefore quite reasonable for those customers to be concerned about the value proposition they are being offered: how much bang for their bucks are they getting? In Europe, the Performance Review Commission of Eurocontrol produces an annual performance report, but it includes only European ANSPs. But for the past six years, the ANSP trade association CANSO has been producing an increasingly sophisticated report, covering as many CANSO members (worldwide) as are willing to provide data.

The CANSO *Global Air Navigation Services Performance Report 2015* was released in December, in three volumes: an executive summary, an industry report, and a report comparing the participating ANSPs. The latter is generally of the most interest to ANSP customers and to researchers and policymakers. In 2015 CANSO obtained data from 34 ANSPs—from the Americas (5), Africa (2), Asia-Pacific (6), Europe (18), and the Middle East (2). Conspicuously absent were two of the most important European ANSPs—DFS (Germany) and NATS (U.K.). The executive summary notes that the majority of participating ANSPs reduced their cost per IFR flight hour in the latest reporting year (2014).

In the volume that compares and contrasts ANSPs, stark differences among the providers are once again evident (and only 28 of the 34 overall participants allowed their data to be compared with others). At least three factors make these direct comparisons difficult. First, there are significant economies of scale in air traffic control, so other things equal, larger ANSPs should have lower unit costs. But other things are not equal, especially when comparing compensation costs between developed and developing countries. In most cases, developed countries will have significantly higher compensation costs than developing countries. A third key factor is the fraction of oceanic ATC operations compared with domestic. It takes more ATC resources to manage domestic flights, for which terminal costs are a larger fraction of the total than for long over-water flights.

For this article, I will compare only ANSPs of highly developed countries, and will report separately for domestic and oceanic airspace. Two key productivity measures are cost/IFR flight hour and IFR flight hours per controller operating hour. For the five advanced developed countries in the report, here are the domestic figures.

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| --- | --- | --- | --- |
| **ANSP** | **Country** | **Cost/IFR flight hour ($)** | **IFR flight hours/controller hour** |
|  FAA ATO | USA | $465 | 0.97 |
| Nav Canada | Canada | $320 | 1.14 |
| JANS | Japan | $604 | 0.81 |
| LFV | Sweden | $618 | 0.55 |
| Airways NZ | New Zealand | $463 | 0.52 |

The average cost/IFR flight hour for all the ANSPs in the report is $498. On this measure, Japan has lots of traffic, but their ATO fails to realize its full potential economies of scale. Sweden's high unit cost may be due to its much smaller size. On the flight hours/controller hour, lower traffic levels hurt the standing of Sweden and New Zealand. Here again, Nav Canada is the productivity champ.

For oceanic airspace, only three of the advanced developed countries have significant oceanic traffic. Their oceanic numbers are the following:

|  |  |  |  |
| --- | --- | --- | --- |
| **ANSP** | **Country** | **Cost/IFR flight hour ($)** | **IFR flight hours/controller hour** |
| FAA ATO | USA | $100 | 5.5 |
| Nav Canada | Canada | $  71 | 6.2 |
| Airways NZ | New Zealand | $  68 | 3.4 |

The average oceanic cost/IFR flight hour was $113, and the average flight hours per controller hour was 3.7. In this case also, Nav Canada takes the honors with a combination of second-lowest cost per flight hour and the highest number of flight hours per controller.

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**Highly Automated and Autonomous Systems Are Coming**

*Guest column by Gary Church*

The future I outline here will begin within the next 15 to 20 years. Large transport aircraft will begin to migrate from the systems in use today, proactively manipulated by onboard flight crews (pilots in-the-loop), to automated systems that are monitored by pilots in the aircraft (pilots on-the-loop). A later step will involve monitoring from the ground, to intercede in the aircraft's operation if necessary. While these are revolutionary concepts, the migration will be evolutionary—one step at a time over a number of years.

A goal being worked on today is an optionally piloted aircraft for the 2030-time frame. This will be a transport category aircraft operated over long distances with a single flight crew in lieu of the multiple flight crews needed today. The flight crew of pilot and co-pilot will take off and land the aircraft conventionally, but for long stretches of en-route flight the aircraft will be monitored by highly automated systems onboard the aircraft and/or systems and pilots from the ground. Currently a major cargo carrier has established a team of 50 engineers to begin planning for as many as 120 optionally piloted transport aircraft for long-range international operations in the 2030 time period. This parallels an Air Force effort to build between 179 and 358 optionally piloted KC-46 tankers during this same 2030 period.

In both cargo and military planning, an early stage concept has a reduced flight crew monitoring the highly automated aircraft onboard, with concurrent monitoring by a second crewmember on the ground. The next big step anticipated well into the future for aircraft not carrying humans may be the movement of flight crew to a ground monitoring position for one or more aircraft, interceding only when necessary. Those currently working on this envision that the level of automation and its sophistication and reliability will only require intervention in rare contingency situations.

Autonomy as it develops for some military and civil applications can go well beyond this once the aircraft is able to act independently of preprogrammed functionality. At that stage, the automation can restructure (in real-time) the means and methods of conducting its mission within some bounds but potentially without human intervention. This means the system has what some would call artificial intelligence.

In June 2015 the Office of the Chief Scientist of the Air Force published a document called *Autonomous Horizons—*an excellent primer on practical considerations for future autonomous operations, and well worth a 30-page read. One of the basic premises is that the roles of the human and the autonomous vehicle must be closely linked to optimize the roles of each and their respective strengths and weaknesses.

There is apprehension in some quarters that the loss of direct human control in cars, boats and planes will create intolerable risks. Nevertheless, the actual trend is that a majority of accidents are caused not by technological failures but by human failures of judgment or performance or misunderstanding of the aircraft systems. The highly reported losses of Air France 447 in 2009 and Air Asia 8501 in 2014 were both attributable to human error in response to aircraft system alerts. According to a 2010 report from the Aircraft Owners and Pilots Association, pilot errors from distraction or poor judgment consistently account for about 75% of general aviation accidents.

Hundreds of millions of dollars are being spent annually to continue to develop more-highly automated vehicles – land, sea and air. The current focus is to begin to develop automated responses to unusual events. These efforts move the human further out of the command and control loop and into monitoring high-level functions. This has resulted in a very positive safety trend, but doing so has also created a new challenge, since humans are not effective monitors, being easily bored or distracted. Further, research on self-driving cars suggests that once a human is out of the loop, the time to reengage and be in a position to take control can take as much as 20 seconds or more. For a vehicle travelling at 60 miles per hour this one-third of a mile. At commercial air transport speeds, it's about 2.5 miles.

This means that highly automated and autonomous systems will eventually replace the human as the weakest link in the automation chain, whether we humans feel comfortable with that or not. Trends will demand ever-increasing safety, efficiency, and performance. This also means finding new roles, responsibilities and duties for the human interacting with highly automated and autonomous systems. Humans will likely take on a managerial role to define mission goals or objectives but without providing detailed instructions, means, or methods—which will be an integral part of the highly complex system software and hardware.

It is a brave new world of highly automated and autonomous aircraft. Since this new future appears inevitable, let's hope that organizations and personnel with a "dog in this hunt" can get well in front of this challenge to help usher in well developed and timely improvements in aviation safety, performance and efficiency.

*Gary Church has consulted with both military and civil manufacturers and operational organizations on unmanned aircraft systems. This commentary reflects his own views.*

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**News Notes**

Nav Canada Gets a New CEO. December brought news that Nav Canada's founding CEO, John Crichton, would retire at the end of 2015, to become chairman of the board of Aireon, the space-based ADS-B company partly owned by Nav Canada. Replacing Crichton will be Neil Wilson, who has been vice president and general counsel at Nav Canada since 2002.

South Africa's ATNS Signs Up for Space-Based ADS-B. Last month space-based ADS-B company Aireon announced its second contract for services with an ANSP (other than its founding ANSP members). Air Traffic and Navigation Services (ATNS), South Africa's corporatized ANSP, will obtain 100% ADS-B services for its two flight information regions, Cape Town FIR and Johannesburg FIR. Those two FIRs constitute 10% of the world's airspace.

FAA Sued for Reverse Discrimination. On December 30th Mountain States Legal Foundation filed a lawsuit alleging reverse discrimination in the FAA's revised controller selection process, which implemented a controversial biographical questionnaire (BQ) as its initial screening device. The suit alleges violations of the Civil Rights Act of 1964 and the due process clause of the Fifth Amendment. The lead plaintiff is Andrew Brigida, holder of two aviation degrees and a 100% score on the previous controller aptitude test. The class-action lawsuit seeks to represent all those screened out by the BQ.

FAA Launches First Phase of VOR Decommissioning. In late November the FAA announced the start of the first phase of its plan to decommission several hundred VORs, the 1940s-vintage ground-based navigation aids. The original NextGen concept called for eliminating nearly all the thousand-odd VORs, but the lack of a back-up to the GPS network (on which NextGen relies) led to the plan to retain a "minimal operational network" (MON). Decommissioning was originally planned for about 500 VORs, but due to concerns from general aviation groups, the number to be retired in phase 1 is just 74, with phase 2 (beginning in 2020) to retire another 234. That will leave the MON at 649 VORs, saving far less in ongoing operating and maintenance costs than originally envisioned.

Reduced Lateral Separation for North Atlantic Tracks. NATS and Nav Canada last month announced the start of Reduced Lateral Separation (RLAT) on the North Atlantic flight track system that they operate cooperatively. Due to the absence of radar surveillance over most of the North Atlantic (the world's busiest oceanic airspace), lateral separation has long been one degree of latitude—60 nautical miles (nm). But thanks to the accuracy provided by ADS-B, and faster and more reliable communications due to controller-pilot data link communications (CPDLC), air safety regulators have approved a reduction to one-half a degree (30 nm). The first step will add one additional flight track each way, but by November the number of tracks will be doubled, as 30 nm becomes standard. NATS and Nav Canada estimate that this change will reduce CO2 emissions on the North Atlantic by 52,000 tonnes per year, thanks to reduced fuel burn due to more flights at optimal altitudes. This will also mean faster trips for passengers.

General Fund Support for FAA Still Low. In debates over corporatization of the FAA's Air Traffic Organization, opponents often claim that U.S. ATC service is subsidized due to the "general fund contribution" representing about one-third of the FAA's budget. Some years have seen percentages that high, but since 2001 that percentage has fluctuated from a low of 7.2% (FY 2015) to a high of 33% (FY 2010), averaging just under 20%. The Omnibus FY 2016 budget recently enacted ended up at 10.7%, above the FAA's request at 8.6% and the House's proposed 6.4%. That is more than enough to cover the FAA's safety regulation and miscellaneous non-ATC functions if all ATC activity is shifted to ATC fees and charges when the Air Traffic Organization is corporatized.

NATS London Airspace Changes Approved. U.K. safety regulator Civil Aviation Authority has approved the London Airspace Management Program (LAMP) proposed by NATS, the U.K.'s corporatized air navigation service provider. Phase 1a will implement a Point Merge system for flights terminating at London City Airport, eliminating holding patterns over Southeast England. Point Merge will sequence arrivals by adjusting their flight times while en-route to London City Airport. LAMP is part of a larger Future Airspace Strategy being developed jointly by NATS and the Irish Aviation Authority (IAA) to redesign airspace within the U.K. and Ireland Functional Airspace Block, part of the Single European Sky effort.

FY 2016 FAA Budget Includes Funding for Space-Based ADS-B. Although the FAA has not yet made a decision about signing up for space-based ADS-B services for the oceanic airspace for which it is responsible, Congress has given it a nudge in that direction. The FY 2016 Omnibus budget agreement provides $15 million for FAA planning for such service, with a report due within 60 days to the House and Senate Appropriations Committees on the status of a final investment decision for the program. FAA had requested only $2 million for this purpose.

FAA Faulted for Weaknesses in Controller Training Contract. A new audit report from the DOT Office of Inspector General criticizes the FAA for not fully implementing OIG's 2013 recommendations before it awarded the successor to its troubled ATCOTS controller training contract. It awarded the new contract without properly defining training requirements and validating training costs. Consequently, "it may encounter many of the same issues that compromised the success of the ATCOTS contract." The report is "FAA Has Not Sufficiently Addressed Key Weaknesses Related to Its ATCOTS Contract," ZA-2016-010, released Dec. 10, 2015

Clarifications re Possible NATS Sale. U.K. reader Barry Humphreys took issue with several points in last issue's article about proposed privatization (via sale) of the U.K.'s NATS and Italy's ENAV. He notes that when the Airline Group (AG) several years ago sought to sell the majority of its 42% shareholding in NATS, the bid by Germany's DFS failed not because of political controversy but "because DFS could not meet the criteria set by AG for the sale." He also points out that the U.K. government has only said that it will "explore" such a sale.

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**Quotable Quotes**

"Fortunately, the first few [ATC] systems that were commercialized began to prove that fears about safety were unfounded. From that perspective, commercialization is a resounding success, as commercialized systems have been able to keep improving safety. . . . Canada, Germany, and New Zealand, among others, have shown how commercialized systems are able to depart from the old ways. From government agencies that used to serve their political overlords, they became independent entities that serve the interests of their customers, the airspace users, first. They are now also able to be self-sufficient financially, not requiring any taxpayer subsidies: a must in fiscally constrained times. Commercialization has created leaner, more-focused organizations that are able to adapt more swiftly to rapidly changing operational and technological environments."
—Rui Neiva, Eno Center for Transportation, "Conclusion and Policy Implications," *Institutional Reform of Air Navigation Service Providers: A Historical and Economic Perspective*, Edward Elgar Publishing, 2015, pp. 150-151

"The main thing about the [Nav Canada] model is that it's not about the technology. It's about the financing and the governance of the system. What's unique today is that we have a set of circumstances here that there is enormous consensus that we should do this. This is not a new idea. This has been floating around for decades. It was an idea that was proposed in the Clinton administration. It was endorsed by numerous studies. Every time there's been a study about how to make air traffic more efficient, this concept has been raised. What's happened [now] is we have a growing consensus that the status quo is simply not acceptable. And the main part that's not acceptable is the uncertainty of financing in the federal budget. It's not that we can fix that just by saying we'll give it more money. That's not how it works; the way that government entities have to spend their money, they have to do it on an annualized basis. So you have an organization that has to make huge investments in capital, and it doesn't have the tools to do it as we do in the private sector. If we had to buy all our airplanes with cash generated in the year that we're buying airplanes, we'd have the smallest fleets in the world. But we can go to the capital markets; we can engage in long-term planning with a great deal of certainty that we'll have the resources."
—Will Ris, Senior Vice President, American Airlines, "Across the Aisle from American's SVP of Government Affairs on Why Privatization of Air Traffic Control Is Good (and Shouldn't Be Called Privatization)," *The Cranky Flier*, Dec. 14, 2015

"What we are essentially doing is breaking the link between the airspace and the physical centre. Spreading our software across centres means that any position at either centre could manage any airspace."
—Simon Daykin, Chief Architect, NATS, quoted in "Game Changer," *Air Traffic Management*, Issue 4, 2015

"Realistically, not all ANSPs—especially smaller ones—can afford a complete infrastructure overhaul to support ADS-B surveillance. The benefit of space-based satellite ADS-B is that its delivery method does not require such action. ADS-B information broadcast from the aircraft will be received by the Aireon payload installed on Iridium NEXT satellites, which will then transfer aircraft data from satellite down to Aireon's ground-based teleport network. . . . Space-based ADS-B will complement our existing surveillance systems, as well, enabling us and other ANSPs to optimize current surveillance infrastructure and improve reliability while reducing costs."
—Ho Wee Sin, Head of Surveillance, CAAS Singapore, "Enabling the Dawn of Space-Based ADS-B," *Air Traffic Management*, Issue 4, 2015

"If there is a possibility of certainty and stability for FAA employees, airports, and operators—then by all means we should consider it. [Chairman] Bill Shuster has given us the broad strokes of a plan that quickly is becoming more about looking at the 'devil in the details.' This is especially true for something as ambitious and broad-reaching as what is being proposed. A number of questions immediately pop up that all need solid answers. How do we transfer employees from the FAA to this new corporation? What happens with pensions? Benefits? Seniority?  . . .  I'm sure I'm not the only one with similar questions, and I look forward to discussing these concerns with Chairman Shuster."
—Rep. Daniel Lipinski (D, IL), "Aviation—A Vital U.S. Economic Driver," *Managing the Skies*, November/December 2015

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