Privatization
Examining the Potential Solutions to FAA Reform

Plus
- A Cost-Effective Approach to ATM Modernization

- The Career of Nevil Shute Norway

- Remote Tower Systems – A Domestic and International Conversation

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*By Peter F. Dumont,
President & CEO, ATCA*

FAA Reform
This Time, It's Up to Us

I'm not saying I'm old, but this debate about the best organizational structure for the FAA is not new to me; in fact, I have participated in this discussion for years. We all have. Most of us first "met" Bob Poole (who weighs in on page 26) when he was young and touting the benefits of FAA corporatization during the Clinton Administration. Dorothy Robyn, who recently testified before Congress on the benefits of splitting the FAA's regulatory mission from its operating mission, originally argued her point 20 years ago from the White House. The FAA's effort to establish a cost accounting system was required under law before we saw Administrator Jane Garvey board a plane to "ride out" the potential Y2K disaster. In 2000, it was legislation that turned the FAA into a performance-based organization and created the Air Traffic Organization (ATO) and chief operating officer (COO) position we have today. So, we have been kicking around this idea of a better FAA organizational structure for a few years.

Our air traffic control discussions should be enhanced with data, ideas, and debate, and I believe that ATCA is in a perfect position to facilitate these discussions. This issue of *The Journal* includes many ideas on the FAA's current state and a potentially better structure. ATCA is not taking a position

except that the status quo is not acceptable and we need to think clearly and carefully about the issue. Just because we have been talking about FAA restructuring for years does not mean we are ready for reform. We first need to identify what problems we are trying to solve and then identify the structural changes to solve those problems. If an organizational change is agreed on, a thoroughly developed transition plan is crucial to the success of any solution.

Obviously, FAA reform will only happen with a legislative change. In the past, while the industry is interested in change, it is usually the Executive Branch that begins the debate in earnest. In our current environment, "aspirations, challenges, and some guiding principles" have been shared. We have been told that transformational change is needed and coming and our industry is being encouraged to come together on a proposed reform approach. We all know the choices to reform come with a bag of potential long-term benefits and some possible short-term costs. Former American airline CEO Bob Crandall recently said at a U.S. Chamber of Commerce event, "If somebody's ox is going to get gored, lets gore it and get on with it."

One of ATCA's many roles is to encourage debate and discussion among our

members and the wider aviation industry. If you read through this issue and do not hear your voice or opinion, or a possible solution, please let us know. Your article could be in the next publication or on our website. We encourage debate, but we also realize that our industry is being asked to move beyond debate and come together on an agreed upon "transformational change" to move FAA reform beyond the discussion stage.

As specific proposals on FAA reform surface this summer, we are all likely to be quick to identify problems. I want to encourage us all to be both problem identifiers and problem solvers. We will continue in those roles as we shape the agenda for our annual conference in November. I encourage you to read this issue carefully, search out the additional suggested reading referenced in this issue, and think about what is best for our future air traffic system. It is our system, and it's clear that our leaders are looking to the stakeholders to come to a consensus on our future. ✈

Peter F. Dumont, President & CEO
Air Traffic Control Association

By Steve Carver
Editor-in-Chief,
The Journal of Air Traffic Control

Is the Grass REALLY GREENER?

The grass is always greener. How many times have you heard that proverb? Is it possible this idea applies to the idea of privatization of the Federal Aviation Administration (FAA) – or any Air Navigation Service Provider (ANSP) for that matter?

We all know how long it takes to move from the requirements phase to implementation of National Airspace Systems (NAS). Cost overruns, software updates, and budget slowdown can sometimes stop the progression of new NAS concepts, systems, and software.

The NAS is full of intelligent and dedicated employees restricted by a safety-concentrated culture. This restriction will not disappear with privatization. So, is the grass really greener? Perhaps – but there are many factors to consider. I get closer to looking over that fence every day.

In this issue, we feature theories, case studies, and success stories on privatization of and from ANSPs. As you read through these articles, I urge you to keep in mind that all things are not created equal, and that includes ANSPs.

So consider the differences between these systems and their users – and how implications would uniquely affect systems in different countries and regions of the world. Privatization is not a topic that will lose steam anytime soon, so it is worthy of thoughtful consideration. ✈

Steve Carver, Editor-in-Chief

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DTAP at Newark International Airport – part of DCIS NextGen Program

MANAGED SERVICES

A Cost-Effective Approach to ATM Modernization

By Chris Giacoponello and Jerry Johnson, Thales

Globally, air traffic management (ATM) systems are undergoing a transformation. Initiatives such as the Next Generation Air Transportation System (NextGen) and Single European Sky ATM Research (SESAR) are focused on enabling new capabilities, improving efficiencies, and modernizing aging infrastructure. With several programs in process, and more anticipated in the coming years, these initiatives create an ideal opportunity to consider the advantages that can be delivered using a managed services approach rather than traditional procurement models.

Due to the mission critical nature of ATM, modernization programs have historically taken many years to complete. Additionally, because of the time and expense associated with avionics equipage, new capabilities must be deployed while maintaining existing systems, often for decades. This further adds to the procurement cost challenges, as new systems and legacy systems operate in parallel, putting a strain on financial and human resources.

Today's Air Navigation Service Providers (ANSPs) are moving away from large, multi-year capital expenditure campaigns. Due to shrinking or constrained budgets, ANSPs are looking for innovative ways to make investments go further, and to apply those investments and resources to areas that are most critical to their primary mission. One option is a managed service approach. Managed services can play a significant role in reducing total cost of ownership, extending capabilities and providing service life beyond those supported by traditional original equipment manufacturer (OEM) procurement models.

The Managed Services Approach

Managed services are a fundamental change in purchasing philosophy – instead of the traditional "procure, deploy, maintain, repeat when obsolete" approach, purchasers of managed services do not procure, deploy, or maintain technology – they purchase the services that are enabled by the technology.

FAA's NextGen SBS
ADS-B Ground Station

In recent years, there has been a significant trend toward the procurement of managed services in the field of information technology (IT). As service capabilities evolve and system complexities increase (particularly those which demand 99.99 percent availability), many service providers have turned toward managed service contracts. The benefits of this approach are clear – businesses operating with a managed services model are able to focus on their primary business objectives, while their solution partners (the managed service providers) address the proactive prevention of issues, and the continuous upgrade and modernization of systems and capabilities.

For example, managed service contracts for critical infrastructure typically include 24/7 monitoring, ongoing maintenance and support, and Service Level Agreements (SLAs), which contractually bind the managed service provider to ensure an agreed upon availability or quality of service. Figure 1 (next page) illustrates several of the benefits of the managed services contracts model.

Most importantly, however, managed services offer a means to reduce total cost of ownership (TCO) over an extended period of time. By allowing the client or service provider (SP) to focus on the business or service offering, rather than maintaining the tools that enable the service, costs can be reduced, customer experience can be improved, and competitiveness increased.

The longer the expected service life, the more important it is to focus on reducing the TCO. Analysis and field experience have repeatedly shown that the cost of maintaining systems over time can greatly exceed the capital investment in those systems.[1] In fact, the inexorable progress of technology development is likely to exacerbate this challenge.

Accelerating Product Life Cycles

As consumers, we are all familiar with the benefits of technological advancements and improvements. Today's products are not only better than last year's models, they are often cheaper. According to Citi Research, the desktop PC market took 12 years to mature and hit saturation in developed markets in 2008. The laptop market took 10 years to mature and hit saturation by 2012. Smartphones and tablets are expected to mature in 2015 – for a life cycle of just seven years and five years, respectively.[2]

While the ATM industry moves more slowly than the consumer high-tech industry, new ATM OEM system procurements will still use commercial off-the-shelf (COTS) IT equipment – and the implications of these trends for technology in general, and IT systems built using today's COTS components are clear: a rapidly accelerating product cycle.

Further, this presents an interesting challenge for ANSPs whose deployment cycles are deliberate and operational life expectancies are long. While the marginal cost of the new equipment and technology may be lower than the previous generation, the life cycle maintenance costs are likely to be higher.

Today's IT systems are more integrated (fewer discrete components), and more highly specialized (embedded software and ASICs) than a generation ago. The result is fewer options for sourcing spare components and the need for more highly skilled technicians to make repairs. For the traditional OEM procurement model, the long-term cost implications are problematic: a requirement for an extensive depot of spare parts, and an expensive, highly skilled maintenance staff. Combine this with shorter product/component life-cycles, and within five to 10 years of commissioning it quickly becomes challenging and expensive to support the system.

With a managed service procurement model, the technology supplier typically assumes responsibility for long-term support and maintenance. Further, with a contract structure that focuses on output-based requirements (e.g., system availability) and service-level agreements (SLAs), the configuration of the system itself may be treated as black-box. This relieves the client (SP) of any obligation to manage operational details such as configuration management and support, freeing resources to be applied to areas that are most critical to their stakeholders. Bottom-line: if the system is performing per the agreed upon SLA, everything is copasetic.

Another significant benefit of the managed services model is the ability to structure a continuous, self-sustaining cycle of modernization. With a clear, contractual obligation to maintain system availability, it is often in the solution provider's best interest to upgrade the system in advance of problems, in order to minimize maintenance costs. This eliminates the costly cycle of recapitalization and procurement for the SP, because the solution provider has the incentive to modernize the system as part of the service contract.

ATM's Transition to Managed Services

As the urgency for modernization is squeezed by the fiscal pressure to deliver within a constrained operating budget, the ATM industry is turning toward managed services. The programs differ by region and customer, the type of service being provided and the SLAs that govern performance; however, they all share a common set of objectives – delivering the required service, reducing the total cost of ownership and assuring system non-obsolescence.

In the U.S., three prominent examples of managed service contracts exist with the Federal Aviation Administration (FAA): the Flight Service Station service contract awarded in 2005, the Surveillance and Broadcast Services Contract in 2007, and the Data Communications Network Service (DCNS) Contract awarded in 2012.

Images courtesy of Thales
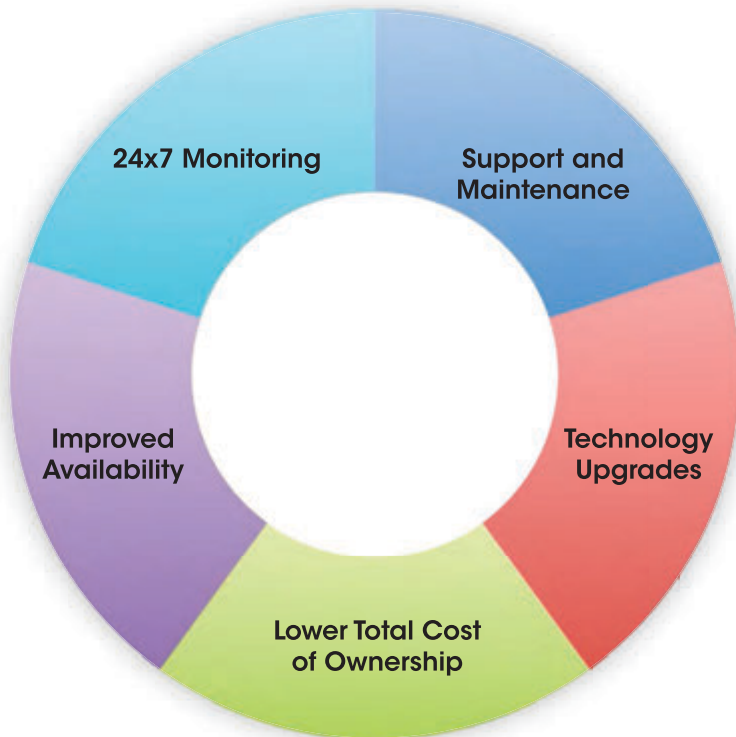
Figure 1. Benefits of managed service contracts

Flight Service Stations

Prior to the award of this contract, the FAA maintained a system of flight service stations consisting of 56 sites. The infrastructure was obsolete and in desperate need of modernization. Under this service-based contract, the FAA achieved facility consolidation down to five sites, infrastructure modernization, and highly effective service provision. The current system operates with an overall cost savings of more than several hundred million dollars per year.

Surveillance and Broadcast Services

A major underpinning of the FAA's NextGen program is the satellite-based Surveillance Broadcast (SBS) Network. A ground-based radio network with more than 600 stations, SBS supports bi-directional Flight and Traffic Information Service Broadcast messages between equipped aircraft and ATM controllers. Developed and operated as a managed service, the SBS contract is an excellent example of the benefits of this approach. The contract includes SLA performance metrics such as service availability, message update rate, and latency. The contract also includes monetary incentives for performance exceeding SLA levels, and penalties for missing minimum standards.

The service-based approach adopted by the FAA for SBS provided the ground work for a program deployed on schedule and budget and one that is delivering outstanding performance. Additionally, the approach has abstracted the FAA from maintaining maintenance and logistics infrastructure for the system and from worries about system obsolescence.

Data Communications Network Services

Another example from an FAA NextGen program is the DCNS portion of the Data Communications Integrated Service (DCIS) Contract. DCIS will enable the National Airspace System (NAS) to handle more traffic, reduce flight delays, and route aircraft more

efficiently and safely by reducing errors associated with voice communications. The DCNS contract specifies service volumes with certain attributes such as geography, latency, and throughput – all defined in SLAs. The SP is tasked with defining how it works (the specific implementation), as well as monitoring and reporting performance relative to the SLAs. Again, there are incentives for meeting performance objectives and penalties associated with failure to meet the SLAs.

Signals in Space

Several ATM navigation and surveillance programs have moved toward managed service contract models. The SLAs are typically measured by the quality and availability of one or more "Signal-In-Space" metrics – that is, the air navigation beacon or surveillance data which is provided by the system to aircraft or ATM systems and controllers.

In the United Kingdom, the Ministry of Defence (MoD) has been a major proponent and champion of the benefits of managed service contracts. For more than a decade, the UK MoD has contracted the modernization and operation of much of its ground-based terminal area and en-route navigation systems as a managed service. This includes tactical air navigation (TACAN), ILS systems and Precision Approach Radars for Royal Air Force (RAF) fields in the UK and overseas.

Project Marshall

More recently, in October 2014, a major contract award was finalized for the safe, flexible modernization and operational management of 63 RAF airspaces: Project Marshall. The scope of Project Marshall – a 22-year program – includes 15 technical services and systems, including primary and secondary radars, navigation aids, approach systems, data communications, and simulators, among others. While Project Marshall will deliver modern ATM services to the RAF, the real beneficiaries are the UK taxpayers – by MoD's calculations, this managed services contract, valued at more than £1.5 billion ($2.4B USD), will save the UK government more than £1 billion ($1.6B USD) over its duration.

Conclusion

In an era of constrained budgets and technology transformation, managed service contracts are a proven approach to solve the challenges associated with maintaining and modernizing the global ATM infrastructure. By reducing total cost of ownership, managed service contracts allow ANSPs and Defense communities to refocus limited resources on mission critical functions and services, leaving the maintenance, operations, and modernization of infrastructure to service providers. Through the establishment of successful, long-term managed service partnerships, ANSPs and private industry have demonstrated the capability to deliver cost effective, efficient, and highly reliable ATM solutions to their governments and public constituents. ✈

Chris Giacoponello is responsible for business development at Thales, and Jerry Johnson is technical director at Thales.

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Aerospace Engineer
Turns Free Time into Literary Fame

The Career of

Nevil Shute Norway

By David Hughes

A painting owned by Dan Telfair of
Nevil Shute Norway

In flight, Nevil Norway climbed out of the giant experimental airship he helped design. Emerging near the bow he knew the wind would be at his back as he negotiated the catwalk.

Up on top, riggers looking for tears in the R-100's fabric nonchalantly walked with hands in pockets, while Norway crawled on hands and knees clinging to guide ropes. He would talk to them while sitting by the fins and later recalled the sunlit rides as pleasant.

Norway, a British aerospace engineer recently graduated after the Great War, wasn't just doing stress analysis on the airship. In the evenings, Nevil Shute Norway was also writing fiction for his own amusement.

For nearly two decades, the author known as Nevil Shute pursued a demanding career in aerospace while writing a series of novels. These and his later novels, many with aviation themes and some made into movies, remain popular today.

"I have always liked to do two jobs at the same time; one helps you to rest from the other and the fact that in the evenings my mind was fully occupied upon the novel gave me a clearer view of the airship problems next morning, I think, than some of my colleagues could achieve," Shute wrote in *Slide Rule*, a 1954 autobiography that covers his days in the aviation industry.

In the 1920s, Norway rose to become the deputy chief engineer on the R-100 airship working under Barnes Wallis, who became a legend in British aerospace and

The R-100 with Shute on board made it safely across the Atlantic to Canada and back to Britain despite being damaged in a thunderstorm

defense engineering. The airship was being built by a subsidiary of Vickers Ltd.

The R-100 with Shute on board made it safely across the Atlantic to Canada and back, despite being damaged in a thunderstorm. However, the government cancelled the program after the rival R-101 experimental airship it was developing crashed with few survivors in Europe on its way to India.

As Shute worked on the airship, he wrote a novel good enough to be published. But he thought Vickers management might take a dim view of one of the company's aerospace engineers writing novels. He also thought his "hard bitten professional engineer" colleagues might conclude he was "not a serious person." So he chose a pen name, shortening his name to Nevil Shute, hoping none of his aviation colleagues would notice.

Shute had written *Marazan* in 18 months during his spare time and he didn't expect to make much money on it. The story follows a pilot as he investigates the murder of a friend. The hero was modeled after several test pilots Shute met while working for another legendary aircraft designer: Geoffrey de Havilland.

The publisher did earn back the meager 30 pounds advanced to the author in 1928, but no more. And then the book went out of print for 26 years.

Shute thought it best to keep his day job.

"I think it is a very good thing that we cannot see into the future. If I had known that a future as an author awaited me I suppose I should have given up engineering at an early stage, and my life would certainly have been the poorer for it," he wrote in *Slide Rule*.

Once the airship project ended, Shute co-founded a civil aircraft manufacturing company, Airspeed Ltd., in 1931. The fledgling aircraft company started by producing a glider and moved on to create small passenger aircraft. Later in the decade, the company designed the twin engine Airspeed AS.10 Oxford. The British government had more than 8,000 built when the aircraft became the mainstay for preparing crews to fly Bomber Command aircraft in World War II.

However, as Shute's success as an author progressed, his interest in directing a mass production aircraft company waned. He had published a series of novels and sold the movie rights to two of them. In 1938, he decided to quit the aviation industry to focus on writing full-time.

During World War II, he continued writing novels while serving in the Royal Naval Volunteer Reserve experimenting with secret weapons. He devised a rocket-propelled lanyard used by U.S. Army Rangers on D-Day. The small rocket shot a hook attached to 500 feet of climbing rope to the top of a cliff so the Rangers could grab ahold and scramble up to attack the German soldiers firing down on them.

Shute became so well known as a writer of novels that the Ministry of Information sent him to cover D-Day. A U.S. Navy tank landing ship with him aboard arrived on D plus one, and he got ashore by first stepping off the ship onto a wrecked landing craft near shore and then waiting for the tide to recede.

Several of his wartime novels were stories about the lives of fictional military aviators. One features a woman armorer who is servicing an anti-aircraft gun on a ship at anchor when a Luftwaffe bomber attacks and she shoots it down.

Shute was a born storyteller who created characters who seemed to sit at a table right across from you sipping a cup of tea. He put ordinary people in extraordinary circumstances and readers turned the page to see if they would rise to the challenge. His deep knowledge of aviation showed in many of his novels.

For example, in *No Highway*, an eccentric British air safety engineer named Theodore Honey worries about a structural flaw in a new airliner. The engineer thinks metal fatigue will cause the tails to fall off

after 1,440 flying hours. The novel was published in 1948 and made into a movie starring Jimmy Stewart in 1951.

Then in 1952, the de Havilland Comet made its debut as the first commercial jet aircraft. About a year later, three Comets broke up in flight with sudden structural failure. It took some innovative scientific detective work by a team at the Royal Aircraft Establishment at Farnborough to determine that the fuselages failed due to metal fatigue.

In another aviation novel, *Round the Bend*, the narrator is a World War II veteran who starts up an air charter company in Bahrain with just a few aircraft. He serves the oil fields at first then starts carrying cargo and passengers all the way to Australia. His lead aircraft engineer sees good aircraft maintenance as a religious experience and attracts a large following of wrench turners to his non-denominational services in or near aircraft hangars. In 1948, Shute flew a single engine, low wing Percival Proctor aircraft from England to Australia on an adventure that led him to the subject of one of his most well known novels. The trip also prompted him to move to Australia for the rest of his life.

> ## "I have always liked to do two jobs at the same time; one helps you to rest from the other and the fact that in the evenings my mind was fully occupied upon the novel gave me a clearer view of the airship problems next morning."
>
> *– Nevil Shute Norway*

During a stop in Sumatra on the trip, he met a Dutch woman who had been part of a group of civilian women moved during World War II around the island from one Japanese prisoner of war camp to another, again and again.

Shute used this story as the basis for his novel, *A Town Like Alice*, one of his best known stories. The tale occurs near Singapore, where a group of British women and children are being marched around the Malayan peninsula by a Japanese guard. The guard is unable to find a Japanese commander willing to take custody of the prisoners, so the women have to march on. The heroine, a woman who worked as a typist before being captured, befriends an Australian truck driver who is also a prisoner of war.

Shute died in 1960 but a love of his books goes on in a surprisingly strong way. Nostalgia plays a key role in readers' affection. Shute said he got to mess around with airplanes when they were small, easy to build, and experiment on flights that always turned up some fresh discoveries. And he tells stories of those exciting times that look, sound, and feel authentic.

Shute still has an active fan club. A lot of information about his novels, including plot summaries, reviews, and a list of real and fictional aircraft mentioned, is posted on the Nevil Shute Foundation website, http://www.nevilshute.org. The group also has a free newsletter and a biennial get-together – usually in Britain or Australia. ✈

Remote Tower Systems – A Domestic and International Conversation

Leesburg Executive Airport Signs Testing Agreement

By Dale Wright, National Air Traffic Controllers Association

Over the past several years, the conversation on remote towers has been making its way across the Atlantic to the United States. Several countries have been testing this technology for years and now Sweden is actually working an airport via their remote tower technology. The air traffic services at Örnsköldsvik Airport have been transferred to a remote tower center (RTC) at Sundsvall Airport, about 60 miles away.

In the U.S., the interest in remote towers did not take off until the threat of closing federal contract towers became real. Many small communities were faced with the real possibility of having their federally funded contract towers closed due to sequestration. The communities that were still hoping for inclusion into the contract tower program have realized the possibility that may never happen. The construction costs associated with building a brick and mortar tower is approximately twice what a remote tower system would be. This makes the remote tower concept appealing to small communities with limited budgets and may also provide an opportunity for more than one community to locate their systems in a common location to reduce staffing challenges. The one unknown expense with the remote tower system is the cost of moving data in the different communities. Some smaller communities may be better suited to move the data at lower costs than others.

When discussing possible locations for a remote tower demonstration, the discussion focused on benefits. With its unique location close to Washington-Dulles International Airport (KIAD) and the airspace challenges of the Washington, D.C. airspace, Leesburg, Va. had the most benefits to be gained.

The Virginia SATSLab, Inc. (VSATS) group and Saab have signed an agreement to test remote tower technology at the Leesburg Executive Airport (KJYO). The Leesburg Airport Authority and Saab briefed the local pilots at KJYO on the benefits of the remote tower. The local pilot community seems to have welcomed this demonstration with open arms.

Air traffic controllers in the United States have asked to be involved in the demonstration at KJYO. While the system deployed in Sweden did meet all ICAO 4444 regulations for air traffic control, controllers in the United States work a totally different type of traffic at airports such as KJYO. The general aviation traffic in the United States offers some unique challenges to the remote tower system, such as controllers being able to visually acquire the target on the video screens and also the ability to observe the aircraft on the surface. The National Air Traffic Controllers Association (NATCA) enjoys a good relationship with Saab (Sensis) that started many years ago with the Airport Surface Detection Equipment (ASDE-X) project.

While Saab does not have the only remote tower system, it is the one that has an agreement to be demonstrated in the United States. Companies such as Searidge Technologies (Canada) and FREQUENTIS have systems being tested in various stages. Germany is the country that has a robust test going on at this time, and Searidge Technologies already has some camera technology being used in the United States at various airports, such as Oakland International Airport (KOAK). In addition, Saab has tested their system in Australia.

Working with the Federal Aviation Administration's (FAA)'s Next Generation Air Transportation System (NextGen) and Requirements Offices, controllers are providing input into safety and technical concerns of both the FAA and users. The equipment is being delivered to KJYO and is expected to be online in the fall of 2015. The camera tower will be located on the terminal building at the airport and the remote tower displays will be in the airport's conference room.

NATCA looks forward to participating in the upcoming research, testing, and demonstration of the Remote Tower System at KJYO. Through collaboration with both the FAA and industry, our nation's air traffic controllers will be provided a great opportunity to validate the benefits and technology of the Remote Tower System. ✈

SPECIAL SECTION

PRIVATIZATION

Our air traffic control discussions should be enhanced with data, ideas, and debate, and ATCA is in a perfect position to facilitate these discussions. This section of *The Journal* includes many ideas on the FAA's current state and a potentially improved structure. There are many options being considered, and ATCA is neutrally positioned to moderate and encourage debate and discussion among members and the industry at large.

Consider the perspectives on the following pages. If you do not hear your own voice represented, contact us and let us know.

Privatization

A Case for the "Half a Loaf" Proposal

By Frank L. Frisbie, P.E., Double F Consulting, LLC

> **A word from ATCA president, Peter F. Dumont:** Some of our members will remember that I recently chaired a session on this subject. Privatization is a subject with which I have past experience and which I believe can benefit from open and vigorous discussion. So, while I am not ready to endorse the approach taken by the author here, I do want to commend the article to you as a thought-provoking option on a subject that we all need to take seriously.

Most will remember back to the time when the U.S. seemed poised to join the popular movement to privatize its air traffic management functions, only to see that movement stopped short of the mark by "settling for" the Air Traffic Organization (ATO). Not that the creation of ATO was without significant benefit – it did create an organization sharply focused on air traffic operations and infrastructure and attract an elite business-oriented leadership team. The creation of the ATO[1] also invigorated the rank and file and ushered in a discipline that emphasized measurable objectives and associated traceable metrics[2] inside the Federal Aviation Administration (FAA) and visibility to the external stakeholder community.

Now, some 10 years later, the ATO "solution" is being widely criticized and calls for "real" privatization are increasingly heard. Ironically, the reasons for dissatisfaction with the ATO organizational form are not rooted in its performance or that of the FAA staff. The fundamental reasons lie not in what the ATO legislation created but what it failed to do – ATO remained encased in the web of the Executive Branch of the U.S. government, dependent upon the associated federal budget processes and the whims of the Congress that appropriates the funds.

After much all-around discussion, while there is agreement that the status quo is deficient, there is little agreement on a new solution. I believe that there is a common failure in the alternatives that have been advanced so far – they are dependent on an "all or nothing" approach to ATO reorganization. This all or nothing approach has the inherent disadvantage that, by its very nature, it embraces all stakeholders. In so doing, the ATO stakeholder constituency, inside and outside of government, is solicited as a body to agree to any privatization proposition with the predictable result that has led to the current impasse.

Even given the prevailing pessimism, there is movement in the U.S. Congress that promises an innovative FAA authorization, leading the optimists among us to think some privatization plan could be seriously considered. It is this glimmer of hope that gave birth to the "half a loaf" proposal embodied herein.

The "Half a Loaf" Proposal

Simply put, the idea is to privatize all domestic high-altitude Enroute air traffic control services in the continental United States, inclusive of all directly associated facilities[3] and personnel. This can be seen as either the end state or, more likely, as a prudent transitional step of indeterminate length, wherein the multitude of consequential details is worked out in a more constrained environment before full NAS privatization.

The benefits that follow from the privatization have been praised elsewhere.[4] They are, in my view, substantial for all stakeholders – service user and provider. They include inter alia, access to capital, needs-based staffing, and freedom to consolidate facilities. For purposes here they get short shrift in lieu of fleshing out the "half a loaf" proposition.

For this case – detaching high altitude control – identifying the affected air traf-

> **The idea is to privatize all domestic high altitude Enroute air traffic control services in the continental United States, inclusive of all directly associated facilities and personnel.**

fic and airway facilities personnel[5] at the ARTCC sites is straightforward. Less obvious is the demarcation of facilities and personnel that provide communications [RCAG], surveillance [ARSR], and NAVAID services to support Enroute operations along with shared communications infrastructure and services [e.g., NOTAMs & Weather] as they presently integrate with service to the low altitude and terminal services.

Assuming that demarcation of the people and facilities listed above can be negotiated, there are more vexing challenges to be faced, the principal of which is definition and designation of the privatized entity. For purposes of opening this discussion, the author suggests that an existing ANSP entity [e.g., NAVCANADA, NATS] or something new [e.g., Aireon] be approached to create and capitalize a new U.S.-centric entity. In any event, to the new entity falls the job of negotiation the labor agreements, engaging the people, and completing real property acquisitions and the like. In the case of the ANSPs mentioned, their prior experience ought to give confidence that these hurdles

are surmountable.

Even if this half-loaf [half-vast?] idea seems indigestible to some, putting aside the parallels that can be drawn from the formation and operation of EuroControl multinational high altitude services, there are domestic precedents for the transfer of NAS services to the private sector. The precedents I would cite are the very successful "contracting out" [A-76][6] undertaking that resulted in flight services being outsourced to a private contractor and the more recent lease of critical surveillance services [ADS-B] from a contractor. Both of these moves were heretical to the idea that the government [e.g., FAA] needed to own and operate all NAS facilities and services and both examples, having been in place for some time now, are universally seen to have been successful. A further attractive feature of the half a loaf idea is that it lends itself to a transition "waterfall," where ARTCC service areas can be transitioned to the private operator one by one, allowing the former to be fully stabilized and operational before the next is transferred.
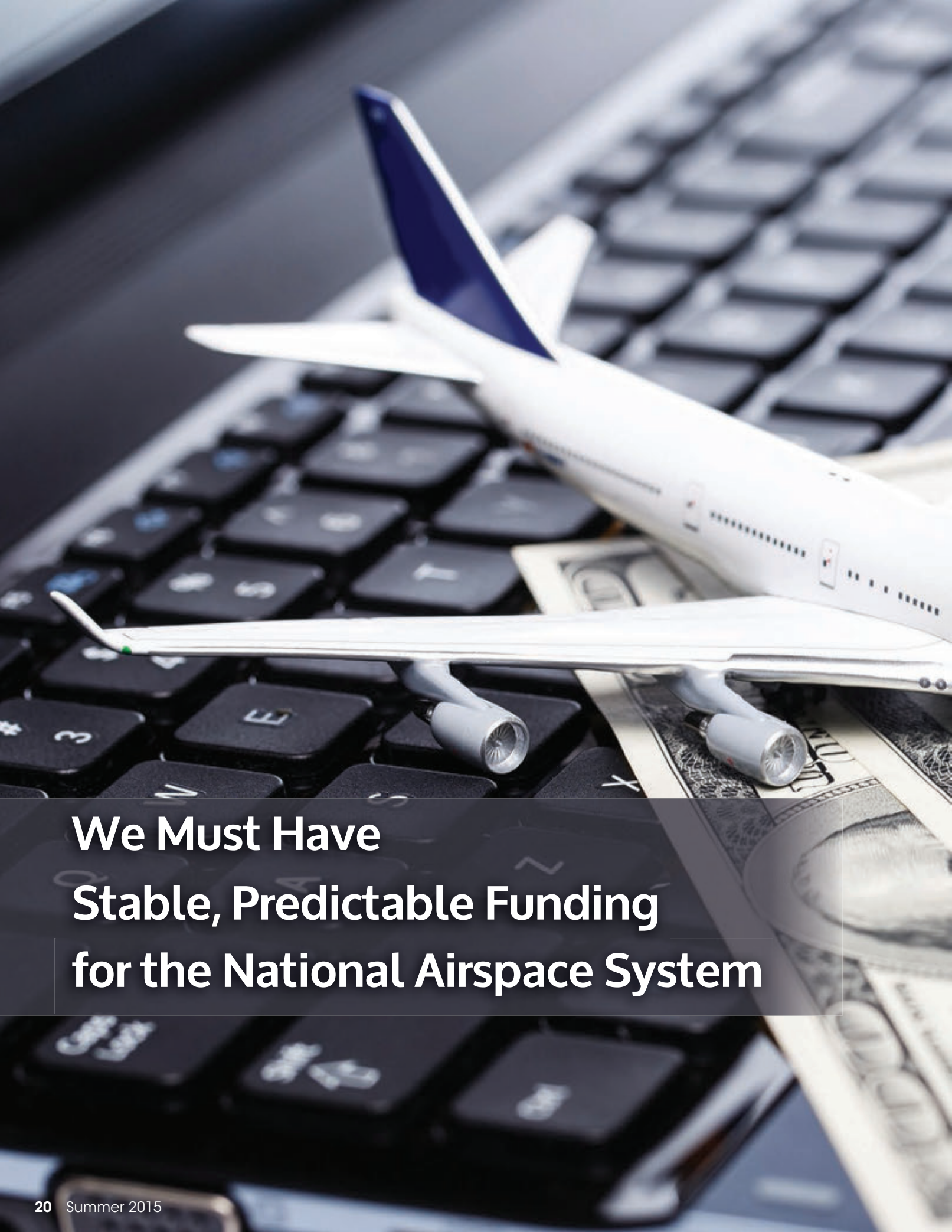
For all of these reasons I believe we need to press on to build a constituency around a more fully elaborated proposal that can be offered for national debate. ✈

Frank Frisbie began a career in civil aviation in 1958. He held senior executive positions in both DoD and FAA. At FAA, he served as deputy associate/associate administrator for development and logistics as well as the first NAS program director.

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[3.] *FAA 2012 Fact Book includes Honolulu, Anchorage, San Juan, and Guam, which are excluded from this proposal for CONUS Air Route Traffic Control Centers [ARTCC].*
[4.] *"Unshackle the FAA," ATCA Proceedings 2014, et al.*
[5.] *Estimated between 312 [ZSE] and 545 [ZOB] FAA employees [Controllers + Tech Ops] at an ARTCC today.*
[6.] *OMB Circular No. A-76 "Performance of Commercial Activities."*

We Must Have
Stable, Predictable Funding
for the National Airspace System

Safety and Efficiency Must Remain the Main Mission

By Paul Rinaldi, President, National Air Traffic Controllers Association

The current funding uncertainty for our nation's air traffic control system is unacceptable. As a result, NATCA is advocating for alternative funding models in order to maintain and advance the system's safety and efficiency.

The lack of stable, predicable funding has led to serious problems at the FAA, including, but not limited to, the inability to finance long-term projects, develop the National Airspace System (NAS) for new users, and modernize our country's aging infrastructure. The funding difficulties have also caused the FAA to struggle to maintain proper resources and staff at our busiest air traffic control facilities.

NATCA believes that the FAA's problems are not due to a lack of sufficient funding to the system. Rather, they are the result of a process where the predictability of funding has been affected by short-term funding bills, government shutdowns, partial FAA shutdowns, threatened government-wide and FAA-specific shutdowns, sequestration, and 23 authorization extensions.

The professionals NATCA represents want to perform their work to the best of their abilities, without the burdens of unpredictable funding. NATCA wants to find a solution to the problems that plague the FAA and our nation's airspace system. The solution is stable, predictable funding for the NAS, which can be handled in the upcoming FAA Reauthorization Bill. We understand that addressing the funding problems may lead to the consideration of potential structural changes for the FAA. Any structural changes must be carefully examined to prevent unintended consequences that would negatively affect other aspects of the system. NATCA's priority is to ensure that we continue to safeguard the world's best air traffic control system during any transition, and that any potential change addresses the funding issue.

We look forward to working with Congress and other stakeholders to determine a solution that protects air traffic control and secures its future growth. But before NATCA can support any change, we must carefully examine all of the specifics. Details matter in this process. No system is like the United States' and no model used elsewhere in the world is perfect, much less suitable for a system as large, complicated, and diverse as ours. Any new model must be mission-driven and must ensure continued robust aviation sector growth throughout every segment of our industry and throughout the entire country. We must protect and strengthen our great national asset that is the air traffic control system.

NATCA believes any reform must include the following principles:

1. Safety and efficiency remain the mission
2. Stable, predictable funding to adequately support air traffic control services, staffing, hiring and training, long-term modernization projects, preventative maintenance, and ongoing modernization to the physical infrastructure
3. Robust and continued growth in the aviation system
4. A dynamic aviation system that continues to provide services to all segments of the aviation community, from commercial passenger carriers and cargo haulers, to business jets, to general aviation, from the major airports to those in rural America

In my recent testimony before Congress about FAA Reauthorization and air traffic control reform, I provided members of the House Committee on Transportation & Infrastructure, Subcommittee on Aviation with an overview of alternative funding and structural models that could address the funding problem. Below are some of those alternatives followed by a brief description.

- **Status Quo Model:** In this model, the FAA would remain as-is with the same funding and structure. Governance would remain within the U.S. Department of Transportation (DOT).
- **Enhanced Status Quo Model:** In this model, governance would remain within the U.S. Department of Transportation (DOT) but changes would be needed to address the manner in which the FAA is funded without changing it structurally.
- **Government Corporation or Independent Agency:** This model would pull out the entire FAA, or parts of the FAA, and create a government corporation or independent agency. The government corporation model would require a Governing Board that includes stakeholders and government officials. This model would leave air traffic

control functions within the government, but would remove them from the DOT.

- **Not-For-Profit Model:** This model would require a Governing Board with stakeholders and government officials. An example of this would be NAV CANADA; its board has three directors elected by the Government of Canada. In this model, safety oversight and regulatory functions would remain within the FAA.

I invite you to read the full testimony, available on www.natca.org, for key points and details of the potential models, including advantages and disadvantages of each and how each would affect the air traffic system.

In our exploration of solutions to the funding problem we have also examined how other Air Navigation Service Providers (ANSPs) are structured, and how well they deliver air traffic control services. There has been significant discussion of the NAV CANADA model. While it may present benefits, NATCA is uncertain if that Canadian model is scalable to the size, complexity, and diversity of our airspace.

- **NAV CANADA:** This privately owned, not-for-profit company established in 1996 works to control the operations of the air traffic control system. Its revenue source is user fees. The advantage of this system is its single-focused mission that prioritizes efficiency. The disadvantages were in its difficult and lengthy transition period. It may also be difficult to apply that model to one as diverse and complex as ours. For example, the United States controls 132 million flights annually (2012), compared to 12 million in Canada in an area a fraction

of the size of the United States' NAS. The United States has 21 centers, compared to seven in Canada, and 315 towers compared to 42. According to Airport Council International's Top 30 Busiest Airports in the world (based on aircraft movements), the U.S. currently has eight of the top 10 busiest airports in the world, and 16 of the top 30. Canada has one – Toronto, which is number 15.

- **NATS in the UK:** This private, for-profit corporation works with the government to create a public-private partnership. However, the profit motive remains. A December 2014 large-scale failure caused delays and cancellations. Some have attributed that incident to the cost-cutting efforts that have delayed upgrades. In addition, in the fall of 2014, NATS lost a bid to provide air traffic services for Gatwick Airport in the UK. Instead, the airport agreed to contract air traffic services to the German ANSP (described below).

- **Deutsche Flugsicherung in Germany:** The government now has control of air traffic functions, which were transferred to a state-owned corporation, called Deutsche Flugsicherung (DFS), in 1993. The system is funded through user fees, which are sufficient enough to continue with modernization efforts. Likewise, it has seen improved productivity and operational efficiency through investments in facilities and equipment. At the time, Germany's federal budget constrained efforts to modernize the air traffic control infrastructure. According to a 2005 GAO study of ANSPs, Germany saw improved safety after its transition, although the report acknowledged

that safety could not be adequately measured or forecasted at the time.

NATCA believes the U.S. must have a mission-driven model; we oppose any model that derives profit from air traffic control services.

We also believe it is critical that the specifics of any reform are vetted among all stakeholders. Not only do the principles need to be sufficient to meet the needs of the NAS, the details of any overhaul, regardless of how significant, must as well.

More than 70,000 flights and over two million passengers are handled daily by air traffic controllers in the busiest and most complex airspace in the world. There are roughly 5,000 planes in the sky at any given moment. Domestic airlines served an estimated 756.3 million passengers in 2014. Every day, millions of individuals and businesses in the U.S. economy rely on the services provided by the complex web of aviation routes. Aviation drives nearly 12 million jobs that contribute $1.5 trillion to the nation's gross domestic product. We cannot afford a mistake that upsets this critical engine of economic growth. There cannot be a disruption in services during a transition.

The U.S. invented aviation, and we have the world's safest system; it is incomparable, unequaled, and unrivaled by any other country. Our NAS is a national treasure. We must continue to grow aviation, allow integration of new users, and maintain a competitive edge to continue to be the leader in the global aviation community. There is too much at stake to continue on the current path of unstable, unpredictable funding.

Corporatizing the U.S. ATC System

How It Could Benefit American Aviation

By Robert W. Poole, Jr., Reason Foundation

On March 24, 2015, I was one of seven people who provided testimony on restructuring the U.S. air traffic control system (ATC) before the House Aviation Subcommittee. The chairman of the parent Transportation & Infrastructure Committee, Rep. Bill Shuster (R, PA), has spoken repeatedly about the many problems the FAA Air Traffic Organization (ATO) has experienced with uncertain funding, implementing the Next Generation Air Transportation System (NextGen) modernization in a timely and cost-effective manner, and dealing with the aging legacy infrastructure of facilities and equipment. He has called for a "transformational" FAA reauthorization bill this year that could include a major restructuring of how this country funds, manages, and oversees air traffic control.

The hearing included testimony from Matt Hampton of the Department of Transportation (DOT) Office of the Inspector General; Doug Parker, CEO of American Airlines; Craig Fuller, former head of the Aircraft Owners and Pilots Association (AOPA) and now vice chairman of the FAA Management Advisory Council; Paul Rinaldi, president of the National Air Traffic Controllers Association (NATCA); David Grizzle, former chief operating officer of the FAA ATO; Dorothy Robyn, formerly the infrastructure expert on the Clinton Administration's National Economic Council; and myself. All seven of us favored funding and structural reform,

with most supporting separation of the ATO from the FAA as a self-funded ATC corporation.

What follows is a slightly edited version of my written testimony from that hearing.

My Credentials on Today's Topic

I direct the transportation policy program at Reason Foundation, a non-profit think tank with offices in Los Angeles and Washington, D.C. My dad worked for Eastern Airlines, so I have been flying on commercial planes since the age of five. I'm an MIT graduate with two degrees in mechanical engineering and my first position after graduating was with a large aerospace firm, Sikorsky Aircraft.

I have been studying the performance of the U.S. ATC system since before the 1981 controllers' strike. Following that strike, I gave an invited presentation to DOT Secretary Drew Lewis and FAA Administrator Lynn Helms on a corporation approach to rebuilding the system. I presented my first paper on ATC corporatization at the Transportation Research Board annual meeting in 1982.[1]

In 1985, I was an advisor to the Air Transport Association's white paper on corporatizing the ATC system. Likewise, I advised Vice President Gore's National Performance Review in 1993-1994 on what became the DOT's proposal for a U.S. Air Traffic Services (USATS) corporation. I was also an advisor to the

For more than a decade, separation of ANSPs from safety regulators has been ICAO policy, and the United States is the last developed country that has not taken this step.

Mineta Commission in 1997, which recommended an approach similar to corporatization. In 2001, a Reason Foundation study that I co-authored with Viggo Butler was a detailed proposal for a user-funded ATC corporation.[2] That plan received the support of 12 retired FAA officials, including three previous administrators.[3]

This decade I have been a member of two working groups seeking to develop consensus recommendations for fundamental ATC restructuring, of which one was convened by the Business Roundtable, starting in 2011. It has included a number of former DOT and FAA officials, as well as leading aviation researchers and consultants. The other working group was convened by the Eno Transportation Center in 2013. Co-chaired by former DOT Secretary Jim Burnley and former Sen. Byron Dorgan, it has engaged 16 aviation stakeholder groups to seek agreement on ATC reform principles. I also serve on the National Aviation Studies Advisory Panel of the Government Accountability Office (GAO) and on a special TRB committee that is planning a symposium on ATC restructuring. I am also a long-time member of the Air Traffic Control Association (ATCA).

Over the years, since the first ATC corporatization in 1987 (Airways New Zealand), I have followed the progress of this change in the structure, funding, and governance of the entities provid-

ing this vital service. I have visited the headquarters and met with the leaders of Airways New Zealand (in Wellington) and NAV CANADA (in Ottawa). I served on the advisory board of the first empirical study of the performance of corporatized ATC providers, alongside former Administrator Langhorne Bond and future Administrator Randy Babbitt.[4] I have met their counterparts at a number of other corporatized Air Navigation Service Providers (ANSPs) conferences organized by ATCA and the Civil Air Navigation Services Organization (CANSO).

Assessment of the Problem

Broadly speaking, I agree with the assessments made by the FAA Management Advisory Council in January 2014 and many others about the problems plaguing the FAA's ATO. These problems can be grouped into three categories, as follows:

- Funding: Uncertain, unstable, and poorly suited to paying for large-scale capital modernization programs such as NextGen
- Governance: A system with so many legislative branch and executive branch overseers that it focuses ATO management attention far more on overseers than on ATO's aviation customers
- Culture: An organizational culture that is risk-averse and status-quo oriented

These problems are all interrelated, but since the culture problem has received less attention than the others, I will focus mostly on that in my testimony today.

My most recent research on ATC reform was a study commissioned by the Hudson Institute as part of their Initiative on Future Innovation. My task was to examine the extent to which the FAA generates innovation in its area of operation (the ATC system) and to explore what would lead it to be more successful in doing that.[5] In the project I selected seven disruptive innovations in air traffic control and did brief case studies on each, observing how each innovation has been dealt with by the ATO and by its corporatized ANSP counterparts overseas. The innovations are as follows:

1. Digital communications between pilots and controllers (DataCom)
2. Replacing ILS with GPS-based landing systems (GBAS)
3. Using GPS for surveillance (ADS-B)
4. Performance-based navigation (PBN)
5. Real-time weather data
6. Remote towers
7. Facility consolidation

The ATO's approach to each of these was far more hesitant than that of corporatized ANSPs in other countries. These findings illustrated its conservative culture and status-quo bias. I next identified five possible explanations of why this culture exists, and the draft report was then sent out to about 15 highly knowledgeable peer reviewers. Hudson convened a one-day workshop at which these reviewers provided feedback, which supported all five hypotheses based on their experience either within the FAA or working with the FAA over many years. Those five detrimental aspects of organizational culture are as follows:

1. **Self-identity as a safety agency, rather than as a technology user.** This stems from the ATO being embedded within FAA, whose mission is safety. Nearly all the innovations relevant to NextGen come largely from the aerospace/avionics industry, which has a much more innovative, dynamic culture. All those companies are regulated at arm's length by FAA safety regulators – but the ATO is embedded inside the aviation safety regulation organization.
2. **Loss of technical expertise.** Partly due to its status-quo culture and partly due to civil service pay scales, the FAA has a chronic problem with not attracting or not being able to retain the best engineers and software professionals. This means that a lot of the detailed requirements for new systems end up being defined by contractors, which can lead to costly additions that make the systems more complex than is needed and more costly than necessary.
3. **Loss of management expertise.** For the same reasons that FAA has limited technical expertise, it also has trouble attracting and keeping top-notch program managers who are used to being held accountable for results.
4. **Excessive oversight.** Inherent in being a large government agency that is spending taxpayers' money, the FAA must be held accountable to all the normal government overseers. The ATO must respond to oversight by the FAA administrator, the DOT secretary, the DOT inspector general, the Office of Management & Budget, the Government Accountability Office, and up to 535 Members of Congress. Responding to all these overseers takes up a large amount of senior management time.
5. **Lack of customer focus.** Because the ATO gets its funding from Congress, it ends up – *de facto* – acting as if its customer is Congress, rather than the aviation customers it is set up to serve.

Fixing the ATO's Organizational and Structural Problems

When I compared this set of problems with what I have observed over the past 15 years in corporatized ANSPs, the remedies appeared to be fairly straightforward.

To directly change the status-quo culture to something more like the innovative culture we observe in the Boeings and Honeywells of the world, the first requirement is to organizationally separate the ATO from its safety regulator parent. That would put the ATO at arm's length from its safety regulator, like all the other key players in aviation – airlines, business aviation, general aviation, airframe manufacturers, engine producers, pilots, mechanics, etc. For more than a decade, separation of ANSPs from safety regulators has been ICAO policy,[6] and the United States is the last developed country that has not taken this step. This change is necessary for changing the ATO's organizational culture, but is not sufficient by itself.

The second requirement is to change the funding system. Instead of having users of the system pay taxes to the government, which channels the funds through the federal budget process and leads to the ATO acting as if Congress is its customer, shift to the system used everywhere else in the world in which airspace users pay fees and charges directly to the ANSP, which in this case would be the newly separate ATO. That would refocus the organization's attention on satisfying its aviation customers, as is true of every other high-tech service business. This is also the model on which airports operate in nearly every developed country, including the United

Cost per IFR Flight-Hour (US$)

ANSP	Country	2010	2011	2012	2013
FAA ATO	United States	$444	$452	$454	$450
Nav Canada	Canada	$335	$338	$325	$334
Airways NZ	New Zealand	$385	$404	$416	$414

Table 1.
Source: CANSO, Global Air Navigation Services Performance Report, 2014, adjusted for exchange rates.

States. Airports issue revenue bonds, based on their predictable stream of revenues that come directly from users, to finance large-scale capital modernization efforts. So do the larger corporatized ANSPs.

The third needed change is a different governance model. Since the revamped ATO would no longer be spending taxpayers' money, the proper oversight should come from those providing the revenues – its aviation customers. So those customers, along with other key stakeholders such as airports and employees, should be the ones responsible for oversight and governance (apart, of course, from arm's length safety regulation by the revamped FAA). If organized as a non-profit corporation governed by a stakeholder board, the result would be an organizational form called a user co-op. There are many thousands of user co-ops in America, particularly in electric and water utilities.

Evidence from Abroad

There is growing evidence over the past 25 years that ATC corporatization has led to better performance by self-funded ANSPs.

The first major study was published in 2006, carried out by MBS Ottawa with support from George Mason University, Syracuse University, and McGill University.[7] It assembled before-and-after data from 10 corporatized ANSPs, and assessed their performance on safety, modernization, service quality, cost, financial stability, and public interest considerations. From the executive study comes the overall conclusion, backed up by detailed data in the 103-page report:

> "The major finding is that commercialization models that provide the right balance of incentives have resulted in significant cost reductions, dramatic improvements in modernization, and major improvements in service quality, while improving safety. Commercialized ANSPs exhibit three main strengths – sensitivity to customer needs, agility in reaching a decision, and ability to carry it through. These characteristics have led to continuous improvements in efficiency, business discipline that delivers projects on schedule and on budget, and rapid deployment of modern technology to enhance service quality."

A second major study appeared in book form in 2007, researched and written by Clinton V. Oster, Jr. of Indiana University and John S. Strong of the College of William and Mary.[8] Their book provides a detailed review of the transition from government agency to self-supporting ANSP in Australia, Canada, Europe, New Zealand, and the United Kingdom. This is followed by three chapters on ATC problems in the United States and suggestions on how to apply the

lessons learned in other countries to U.S. ATC reform. The IBM Center for the Business of Government had Oster and Strong produce a 65-page report using the Canadian and British experiences to recommend a corporatization approach for the United States.[9]

In recent years, two international organizations have been collecting and publishing data on ANSP performance and cost-effectiveness: Eurocontrol and CANSO. Eurocontrol's Performance Review Commission deals only with the ANSPs of the 39 European members of Eurocontrol. CANSO, which has 90 ANSP members worldwide, relies on voluntary reporting from member ANSPs, and some of the higher-cost ones have not always released their numbers. CANSO's 2014 report includes performance figures for a number of developed-country ANSPs, including the FAA's ATO. One key performance indicator is cost per IFR flight-hour. Figures for several ANSPs are presented in Table 1 (above).

For comparison purposes, the latest available figures for several other developed countries are for 2011, and are $650 for Germany's DFS, $774 for the UK's NATS, and $801 for Spain's ENAIRE. While many factors account for differences in ANSP performance, it is noteworthy in comparing NAV CANADA and the FAA ATO that the former is significantly more productive, as measured by cost per IFR flight hour, despite NAV CANADA being only one-ninth the ATO's size and activity level.

Which Organizational Form Is Best?

Of CANSO's 90 full members, including the FAA's ATO, about two-thirds (60) are commercialized, i.e., self-supporting from fees and charges and regulated at arm's length by the government's safety regulator.

In its recent report on ATC corporatization, the Congressional Research Service provided a table listing 22 ANSPs with their number of centers, number of employees, and organizational form.[10] The most common form (13 of the 22) is a government-owned corporation. Another five are government agencies, and three are various forms of non-government companies. These three are NAV CANADA, Skyguide (Switzerland), and NATS (U.K.). Though not listed in the CRS table, AeroThai is also a non-government corporation.

In choosing between a government corporation model and a non-profit corporation model, it is important to understand the profound difference between a "government corporation" in countries such as Australia, Germany, and New Zealand versus the typical "government corporation" in the United States. In most modern western nations, a government corporation is for all practical pur-

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poses a real business, incorporated under normal corporate law, but with all of its shares owned by the government. In most cases, it is entirely self-supporting from customer revenues and has access to the bond market to finance long-lived assets.

That is dramatically different from most government corporations in the United States. Most of our government corporations remain part of the federal budget. Many have congressional oversight committees, require OMB budget approval, and are subject to audits by GAO and possibly by an inspector general. Even the nominally independent U.S. Postal Service is subject to congressional intervention in what should be business decisions such as closing unneeded facilities, and its rates are overseen by a Postal Regulatory Commission that pursues multiple goals beyond ensuring a well-run, cost-effective business. Even the Tennessee Valley Authority, one of America's largest electric utilities, though only nominally on budget, still has congressional oversight committees, an arbitrary cap on bond issuance, and a politically appointed board.

An alternative that has received serious attention from the Business Roundtable is a federally chartered nonprofit corporation. The American Red Cross and the U.S. Olympic Committee were chartered by acts of Congress as self-supporting, tax-exempt, nonprofit corporations. COMSAT, which pioneered communications satellites, was originally organized this way, but later became an ordinary for-profit company. The Red Cross and Olympic Committee boards are not political appointees; they are selected by these organizations based on candidates' relevant knowledge and experience. This model is actually closer in how it functions to the well-managed government ATC corporations like Airways New Zealand, than typical U.S. government corporations like the Postal

Service and the TVA.

There is also extensive U.S. experience with the nonprofit user co-op model. There are thousands of examples of rural utility co-ops, agricultural co-ops (Sunkist, Ocean Spray) and federally chartered credit unions. User co-ops are also common in U.S. aviation. There are many common-use co-ops in operation at airports, such as LAXFuel Corporation, jointly owned by airlines serving Los Angeles International Airport to operate a fuel farm and provide aircraft fueling services. And two major entities in aviation were organized as user co-ops – ARINC and SITA. ARINC was set up by fledgling U.S. airlines in 1929 to be the licensee for air-to-ground radio services. It went on to develop the earliest air traffic control services (which were taken over by the Commerce Department in 1936). ARINC remained in business as a user co-op providing worldwide communications and other services to aviation into the first decade of the 21st century, when it was purchased by the Carlyle Group and more recently acquired by Rockwell Collins. SITA has retained its original nonprofit, user co-op status and among its many aviation services is partnering with CANSO to provide ANSP billing services worldwide.

Canada's ANSP, NAV CANADA, is similar to the user co-op model. It was chartered by an Act of Parliament as a not-for-profit, stakeholder-governed corporation, designated by Canada as its provider of ATC services, consistent with ICAO policies. It has an excellent track record, and as noted in Table 1, is delivering ATC services at higher productivity than the nine-times-larger ATO. To me, that suggests the potential for significant productivity gains from corporatizing the ATO as a federally chartered, nonprofit, tax-exempt, stakeholder-governed corporation.

After three decades of research on ATC reform, my conclusion is that the nonprofit corporation model with stakeholder governance is the best organizational form. In particular, it is most likely to produce the kind of organizational culture we need to regain U.S. leadership in air traffic control. And I'm happy to report that this is also the conclusion of the Business Roundtable's extensive efforts. ✈

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MODERNIZATION

of U.S. Air Traffic Control Means Modernizing the Whole Aviation System

It's Time for Bold Solutions and Creative Approaches

By Kevin M. Burke,
Airports Council International-North America

O n Feb. 24, Congressman Bill Shuster (R-Pa.), chairman of the House of Representatives Transportation & Infrastructure Committee, wrote in an opinion editorial published in *The Hill*:

> *Today, we have the busiest aviation system in the world. Fifty million flights and 800 million passengers traverse our skies every year. In the next decade or so, our system is expected to be moving one billion passengers annually… As the number of passengers grows over the coming year, Americans stand to lose more time and money to delays.*

Congressman Shuster's context was the slow implementation of the Next Generation Air Transportation System (NextGen) and bureaucracy of the Federal Aviation Administration (FAA), and particularly the burgeoning congestion of the American airspace.

"[A] transformative aviation bill is one of the highest priorities of the House Transportation and Infrastructure Committee this year," he concluded, referring to the 2015 FAA reauthorization legislation, which will set the course not just for the agency for the next five years, but will influence the shape of the U.S. aviation landscape for years to come.

It's no secret in Washington that the focus of conversation surrounding a transformative FAA reauthorization is major reform to the nation's air traffic control system. As the president and CEO of Airports Council International-North America (ACI-NA), I represent members in both the U.S. and Canada, which privatized its air traffic control in 1996 with the creation of NAV CANADA, and which is regarded as a model by many in Congress and other proponents of decoupling air-traffic control from the FAA. Whether or not U.S. air traffic control was to be privatized in the near future, it is absolutely clear that priorities for safe, secure, and efficient skies will remain constant. From the perspective of the airport industry, the conversation around privatization is not so much about air traffic control itself, but rather how its reform is one

piece of a much larger puzzle. It's important to understand that in 1996 Canada also reformed its airport-financing model by moving to a user fee system.

ACI-NA agrees it's time for a transformational bill, one that considers bold solutions and creative approaches to long-standing challenges. Once completed, this new FAA authorization will set the tone for airport operations through 2020 and well into the 21st century. However, we can't just transform air traffic control. We must also transform the "on the ground" 20th century infrastructure that supports air traffic control goals. With the number of people flying in the U.S. on track to surpass one billion within the next 20 years, our aviation system and all of the players – airports, airlines, air traffic equipment providers, controllers, and other industry partners – are at a crossroads.

Having the focus on air traffic control, however, should not preclude airport priorities in FAA reauthorization discussions. In addition to both aspects being vital parts of a larger whole, U.S. air traffic control and U.S. airports share the striking similarity in that they are fixed assets affected by increasing capacity. While the forecasted growth in air traffic will undoubtedly be a driver of economic growth for communities served by airports and the travelers and cargo shippers they help connect to the rest of the world, a still-congested airspace governed by outdated technology will limit the gains. Likewise,

airports are still constrained by outdated capacities.

There exist many additional projects at airports across the country to meet capacity growth and accommodate aircraft innovation; enhance safety, security, and environmental compliance; and maintain and rehabilitate existing airport facilities. Looking at just the next five years, these necessary projects total more than $75 billion, or more than $15 billion per year. A frequent refrain made by the major U.S. airlines is that they have helped invest in certain airport capital improvement projects, but this only tells a fraction of the story.

There are three primary mechanisms that fund airport capital improvement projects: the Airport Improvement Program (AIP) grant fund, the Passenger Facility Charge (PFC), and airport-generated revenue. AIP grants provide the financial cornerstone for airside projects at many airports, while the PFC does so for terminal improvements. In recent years, however, both mechanisms have been weakened by decisions made in Washington. AIP has been targeted to fill unrelated federal budgetary shortfalls – including for air traffic control – while the purchasing power of PFC has significantly eroded. In the 15 years since Congress last set its maximum, the PFC's $4.50 value has decreased by roughly half.

A modernized PFC and a strong AIP allow airports to determine their future in terms of competition, traffic, and capaci-

ty. Equipping airports and their communities with the financial mechanisms to best address their individual needs would mean that airlines would have to adapt to stronger – and ultimately healthier – competition amongst one another. This is exactly the environment the U.S. will need to stay competitive with the rest of the world.

Rising consumer demand for air travel, meanwhile, only further underscores the need to simultaneously transform U.S. air traffic control. But without modernizing funding mechanisms for airport infrastructure and capital improvement projects, there will be no tangible advancements in alleviating an increasingly congested airspace. Ultimately, any conversation about privatization is moot without comprehensively overhauling and upgrading the antiquated technology that compromises the maximum efficiency for passengers, cargo shippers, airports, and airlines.

U.S. airports are prepared to lead a transformed commercial aviation system and maintain our position in the global aviation system. Exploring and implementing solutions to modernize and improve how we support and invest in our total aviation infrastructure, from our airports to our airspace, will best position us for improved safety, security, efficiency, and capacity for the passengers and cargo that will take to our skies well into the 21st century. Stubbornly adhering to the status quo will only keep us from seeing what is beyond the horizon. ✈

The NAV CANADA Model

An ANS Model That Has Withstood the Test of Time

By John Crichton, NAV CANADA

PART 1

NAV CANADA has owned and operated the Canadian civil air navigation service (ANS) since Nov. 1, 1996, after having purchased the system from the Government of Canada for $1.5 billion.

NAV CANADA is a private-sector company, in charge of air traffic control, flight information, airport advisory, and the many other services typical of an air navigation service provider. There is no longer any substantive debate about the effectiveness of the NAV CANADA model as the organizational and corporate basis for managing the world's second largest ANS, in terms of air traffic movements, airspace size, and physical assets.

This article focuses on the essential elements that make up NAV CANADA's non-share capital corporation model; how these elements interact to support a safe, efficient and cost-effective air navigation service; and why they make as much sense today as they did in 1996.

The Need for Reform

A good place to start is to look at some of the problems the company was designed to solve. Simply put, by the 1980s, Canada's ANS was not working well.

The federal government, operator of the service since 1939, was struggling with huge budget deficits and was no longer willing or able to make the capital investments needed to modernize the system. Resources and infrastructure had not kept pace with the steady growth in air traffic.

New technologies that would have improved efficiency failed to get off the drawing board, or were failing in the developmental stages. With funding tied to the federal appropriations process, the needs of the ANS often took a back seat to programs in other areas of government. The result was poor service and increasingly costly delays.

Everything pointed to a system stretched to the limit. The situation produced a consensus among ANS stakeholders – including airlines, employees, and the government itself – that the system was badly in need of reform.

Establishing a New Structure

Early on, three groups came together to form the initial collaboration that led to the privatization – commercial aviation management, airline pilots, and air traffic

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The NAV CANADA Model

- Natural Monopoly
- No Need for Prescriptive Economic Regulation
- Customer Financial Backing
- Investments Enhance Customer Value
- No Distribution of Profits
- Customer/Stakeholder Board of Directors

The NAV CANADA model has proven to be a constructive approach to air navigation system governance and management. The lack of shareholders and share equity is accepted on the basis that the ANS is a natural monopoly, not motivated to create wealth, but rather to provide ANS services. Customers provide the critical financial backing to the corporation through the revenue stream for these services. Since there are no shareholders, there is no distribution of profits, and the customer presence on the board (five directors out of 15) helps ensure investments are directed at enhancing customer value. Time has demonstrated that this approach obviates the need for prescriptive economic regulation.

controllers. Together, they made fundamental decisions that proved to be the cornerstone of the Canadian ANS commercialization process.

Those decisions were:
- The ANS had to be taken out of government, while government would retain its role as safety regulator
- The key stakeholders had to have a significant voice in the new operational entity
- Each group had to work together for the common goal and respect the others' legitimate, but sometimes differing, interests

This alliance grew over time to embrace other stakeholders such as business aviation, general aviation, and the bargaining agents of other ANS employees. It proved to be a powerful force, in terms of influencing government and the financial markets. But how did the alliance do that?

Non-Share Capital Corporation

The private, non-share capital corporation model balances the needs of all ANS stake-

holders. The lack of shareholders and share equity, while novel, was accepted on the basis that the ANS is a natural monopoly, which should not be motivated to create wealth, but rather to provide a service to aviation. The significant customer presence on the board ensures that the company is service-oriented and customer-focused.

From the standpoint of the key labor stakeholders, the absence of direct shareholders and the structural balance on the board (which includes union appointees), provides comfort that the corporation is motivated to focus on its operational mission without the preoccupation of the profit motive for individual investors.

From the government's viewpoint, the non-share capital corporation is seen in a politically favorable light for similar reasons including:
- No perceived sell-out to private interests
- Balanced participation for key stakeholders
- A high degree of ongoing motivation to run the system safely and efficiently
- Seats at the board table for government to oversee the general public interest

- A private sector entity acknowledged by the financial markets, and thus able to be financed without government support

Monopoly Status

The acceptance of the non-share capital model by all of the stakeholder community also made it relatively easy for the federal government to grant the system an effective civil air traffic control monopoly in the enabling legislation, the Civil Air Navigation Services Commercialization Act (the ANS Act).

Other than safety regulation by Transport Canada, this monopoly is largely self-regulating due to the significant involvement of the customers or "payers" in the management of the corporation through the board and the charging principles in the ANS Act. It is also a monopoly, which, in the eyes of the ever-competitive airline industry, is seen as neutral because of the non-share capital nature of the corporation and the ability of airlines to elect a significant number of Directors to the Corporation's Board.

Under the NAV CANADA non-share

Illustration: NAV CANADA

capital model the company is not profit-oriented. Rather, charge-out rates to airline customers are established to recover company costs, capital expenditures are funded out of operating cash flows, and debt levels are progressively reduced.

The Model at a Glance

NAV CANADA has "members" that perform many of the traditional duties of shareholders such as electing directors, amending by-laws, and appointing public accountants (auditors).

The five members of NAV CANADA elect directors as follows:

- Airlines – elect four people to the NAV CANADA board, the most of any single member
- Federal Minister of Transport – on behalf of the federal government, elects three people to the board
- ANS Unions – together elect two people to the board
- The Canadian Business Aircraft Association – elects one director to the board
- The Director Member – on behalf of the board as a whole, elects four directors, who must be unrelated to any ANS stakeholder

The president and CEO is also a director. The result is a board of directors where all stakeholder interests are represented but none dominates. In order to ensure the board's independence from management, the offices of chair and that of the president and CEO cannot be held by the same person.

Service Charges: Oversight

The legislation governing NAV CANADA activities stipulates numerous principles with which the company must comply. For example, service charges must not be set at a level that, based on reasonable and prudent projections, would generate revenues exceeding the company's financial requirements, including debt service and those amounts needed to maintain prudent financial reserves and credit ratings.

Service charges, based primarily on aircraft weight and distance flown, must be set in accordance with a methodology that is developed in consultation with customers and published. The structure of the charges follows a set of principles set out in the legislation and which reflect those set out in International Civil Aviation Organization (ICAO) guidelines.

For non-Canadian airlines, this is important as it has the effect of importing established international principles into Canadian domestic law and enhancing their enforceability.

Service charges can only be changed after advance notice and consultation with customers and are subject to appeal to an independent tribunal on the grounds that the notice periods were not complied with or that one or more of the charging principles in the legislation was breached. (There have been only two occasions when a proposed change in charges was appealed to the Canadian Transportation Agency and both appeals were denied.)

Service Delivery Oversight

Subject to safety oversight by Transport Canada, the corporation is free to alter its levels of service and may reduce, expand, or close facilities, provided that material changes are first the subject of consultation with affected customers.

In practice, the corporation consults closely with customers and stakeholders prior to embarking on any major initiatives, be they technical or financial. In addition, discussions on key issues and plans are held with leading industry associations and with customers directly at the executive and operational levels.

Operating as a Business

A key element of meeting customer needs was the realization that the company had to be run as a business, with the same focus on costs, consistent with safety, as its customers. In fact, in many ways the company's customers are the "notional" shareholders of the business, due to their continual investment in the company through the payment of service charges.

The pre-NAV CANADA system was funded through a tax on passengers, and collected by the airlines. Now the service is paid for directly, so customers have a much greater stake in the outcome.

It is no surprise then that the level of the company's service charges is a major focus for the airlines that fly through Canadian airspace. There was only one period when general service charges had to go up, following the 9/11 attacks as traffic volumes plummeted. But for the most part, service charges have evolved at far less than the rate of inflation. These charges are the primary source of funding for the ongoing operation of the Canadian ANS, generating approximately $1.2 billion in fiscal 2014.

Beyond the revenues from its core business, NAV CANADA has had success in selling technology and related services to other air navigation service providers.

Financing and Service Charges

The company is financed through the bond markets and makes use of additional financing through bank credit lines.

From the beginning, NAV CANADA has enjoyed AA credit ratings due to a variety of factors such as its statutory monopoly, its position in the industry providing an essential safety service, and the underlying characteristics of the airline business, with continued expectations of growth and expansion in the long term despite some short-term volatility.

As a result, and based on the company's track record, NAV CANADA continues to enjoy broad debt market access at low rates.

The company's financial model allows it to incur deficits during downturns, through the use of its rate stabilization account. This mechanism reduces the amount of customer service charge volatility due to cyclical fluctuations in air traffic volume. Of note, service charges did not increase in the period 2004-2014, and there were two reductions in 2006 and 2007. During this 10-year period, NAV CANADA charges were 25 percent less than the cumulative inflation rate.

By the same token, the company's rate setting powers do allow for rate increases when these are required to meet its fundamental financial requirements, part of its financial strength which the markets recognize.

Accountability

The NAV CANADA governance model leaves management with a great deal of discretion and accountability in dealing with external financial challenges. The company's response to downturns in air traffic and revenues has been to apply strict expenditure controls and productivity initiatives that have translated into a measured program of personnel reductions, while ensuring optimal staffing in the company's operational facilities.

Original Promise

Has the original promise of NAV CANADA as a constructive alternative to a traditional government function been met?

Looking back over the years of experience and achievements since 1996 – and ahead to the promise of new initiatives such as global, space-based ADS-B – the answer would be a clear "yes."

The NAV CANADA Track Record

It Begins With Safety

By John Morris, NAV CANADA

PART 2

NAVCANSuite integrated ATM technology includes a fully harmonized suite of air traffic control tools, combining flight data, operational data, surveillance, and airfield lighting control. It provides air traffic controllers with an environment that enhances safety and efficiency, and reduces controller workload. NAV CANADA's technology has been sold to other Air Navigation Service Providers around the world.

The NAV CANADA track record begins with safety. It is our business imperative since no aviation business can afford a loss of public confidence.

The company has seen a decline in IFR-to-IFR losses of separation, the industry safety benchmark, from 1.4 per 100,000 air traffic movements in 1997 to 0.77 per 100,000 in 2014. By far, the majority of these were technical infringements with no risk of collision.

Safety improvements have been gained on a number of fronts. Investment in technology, such as advanced surveillance, new communication systems, and automated warning functions, have enhanced safety awareness. Educational programs have been developed to increase awareness of the importance of proper pilot-controller communications and other safety related issues, while collaborative activities with customers, airport authorities, and other stakeholders have been undertaken to reduce safety-related events such as runway incursions.

Our safety culture and management system are reinforced through the activities of our independent Office of Safety and Quality, in conjunction with our operational groups. At the same time, we have strengthened our reporting culture through joint management/union efforts to encourage early reporting of a broad range of incidents in a supportive environment.

The company is subject to regulatory oversight by Transport Canada, the safety regulator, in addition to the safety investigations conducted by the Transportation Safety Board.

Delays Down, Efficiency Up

Since 1996, NAV CANADA has seen steady success in reducing flight delays and improving efficiency.

Working collaboratively with the industry, NAV CANADA initiatives range from airspace changes that enable more direct routings, to more significant technological advancements offering considerable improvements in efficiency, capacity, and safety.

Our Collaborative Initiatives for Emission Reductions (CIFER) report provides a comprehensive description of our efficiency programs and their benefits to our airline customers, including fuel savings, and reductions in greenhouse gas emissions.

All images courtesy of NAV CANADA

Since 1996, NAV CANADA has seen steady success in reducing flight delays and improving efficiency.

The world's most advanced Oceanic air traffic management system, GAATS+, is used by controllers at the Area Control Centre in Gander, Newfoundland, to direct more than 1,000 flights a day as they transit over the North Atlantic. This system was recently implemented by NATS of the UK, ensuring seamless service across the busiest oceanic airspace in the world.

NAV CANADA Rate of IFR/IFR Losses of Separation per 100,000 Aircraft Movements (5 Year Moving Average)

NAV CANADA   SERVING A WORLD IN MOTION

NAV CANADA Productivity: Staffing Versus Traffic in Weighted Charging Units

NAV CANADA   SERVING A WORLD IN MOTION

Cost Management

The initial NAV CANADA business restructuring – from 1997 to 2001 – generated hundreds of millions in cumulative savings by reducing administrative headcount, closing regional administrative offices, and re-engineering key processes, while at the same time increasing controller staffing to address a shortage inherited from government.

Today, the cost management focus continues through consistent control of staffing levels (a reduction of approximately 30 percent from the outset) and ongoing technology and process improvements.

Infrastructure Renewal

The company committed to make ongoing investments in infrastructure renewal, from new facility construction, to lifecycle replacement of navigation aids, to the installation of alternate surface surveillance, most of which is now complete. This renewal program has improved service, and proved to be more cost-effective by reducing maintenance costs and improving system efficiency.

Technology and Systems

It is difficult to find an area of the Canadian ANS that has not been subject to our modernization drive. As a result, many of the company's systems have been consolidated, reducing complexity and improving performance and reliability.

NAV CANADA purchases equipment and systems where practicable, but has in-house expertise to build or adapt to meet specific operational requirements or improve efficiency – especially with regard to air traffic management applications, an area in which it is an acknowledged global leader.

Canadian Automated Air Traffic System (CAATS)

CAATS has been the company's most ambitious and complex modernization project to date. Fully operational for several years, it is the ANS backbone flight-data processing system offering key safety, efficiency, and time-saving improvements.

CAATS integrates all individual flight information, allowing controllers to handle increased traffic more efficiently and safely. It has been enhanced to enable domestic controller pilot data link communications (CPDLC) and medium-term conflict detection (MTCD).

As reported in *The Journal of Air Traffic Control*, CPDLC has been fully deployed in Canadian domestic airspace for use in en route operations, and has been operational in the North Atlantic region for well over a decade. With the recent domestic deployment, use of CPDLC has been growing rapidly, with associated safety and efficiency benefits.

Gander Automated Air Traffic System (GAATS+)

GAATS+, another advanced air traffic management system, is at the center of our efforts to improve flight efficiency over the North Atlantic, which is the busiest oceanic airspace in the world.
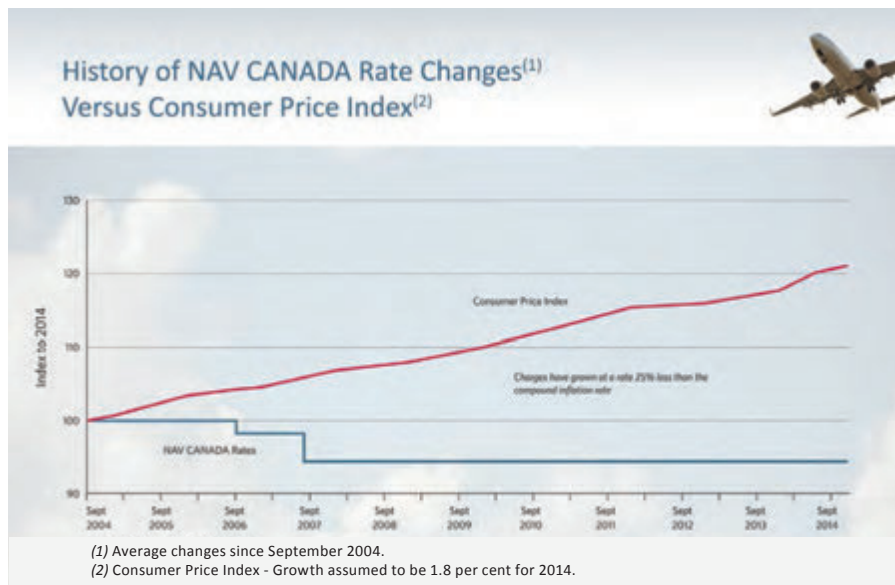
The system automates flight data processing so controllers can manage both random and track-based traffic. Integrated into GAATS+ are not only CPDLC, but also Automatic Dependent Surveillance Broadcast (ADS-B) and Automatic Dependent Surveillance Contract (ADS-C), which facilitates reduced separation in the North Atlantic, allowing equipped aircraft to request optimal flight profiles.

The advanced features of GAATS+ proved attractive enough to NATS in the UK that they bought the system from NAV CANADA. The result is a seamless approach to oceanic air traffic services provision from North America to Europe.

NAVCANatm

The company continues to lever the benefits of technology we have developed through our international technology-marketing program.

The NAVCANatm suite of integrated ATM products includes electronic flight strips, an operational information display system, a digital-automatic terminal information service, surveillance displays, and airfield lighting control. Other products

History of NAV CANADA Rate Changes[1] Versus Consumer Price Index[2]

(1) Average changes since September 2004.
(2) Consumer Price Index - Growth assumed to be 1.8 per cent for 2014.

NAV CANADA   SERVING A WORLD IN MOTION

include technology solutions for tower, terminal, en route, and airport operations.

NAVCANatm technology has been sold to other ANSPs around the world, such as the UK, Denmark, Australia, Dubai, Italy, Hong Kong, India, Luxembourg, and the Dutch Caribbean. This type of program provides ANSPs and other industry counterparts the opportunity to avoid the costs of duplicate development and quicken technology deployment by using systems with a proven track record.

Automatic Dependent Surveillance-Broadcast

When the company was faced with a decision to extend air traffic surveillance coverage in the Hudson Bay area, it selected Automatic Dependent Surveillance-Broadcast (ADS-B) to provide radar-like information at a much lower cost than radar.

Since then, ADS-B air traffic surveillance has been further expanded into the Eastern Arctic and over Southern Greenland. Airlines are seeing big savings as a result of more efficient routes and altitudes made available through expanded airspace capacity.

Aireon

But this is only the beginning. In an exciting joint venture with Iridium Communications, known as Aireon, ADS-B receivers will be installed on Iridium's next generation of Low Earth Orbit (LEO) satellites to expand air traffic surveillance around the globe.

The resulting expansion in airspace capacity will revolutionize the way air traffic services are provided over the world's oceans

A NAV CANADA air traffic controller communicates with pilots through Controller-Pilot Datalink Communications (CPDLC), a system that allows the exchange of many routine air-ground communications to occur via digital text message rather than voice. NAV CANADA recently completed the implementation of CPDLC in its domestic airspace above 29,000 ft., with significant benefits in safety and efficiency.

and remote areas. Through more efficient spacing and more fuel-efficient routes and altitudes, this new capability will lead to billions of dollars in annual fuel savings for the world's airlines, with more than $100 million in savings per year in the North Atlantic alone.

NAV CANADA is a major player in this joint venture in partnership with Iridium, ENAV of Italy, the Irish Aviation Authority, and Naviair of Denmark. NATS of the UK signed on as an early customer, and since then customer agreements have been signed with other ANSPs around the world, and the list is growing.

One Wish for Aviation's Future

ATC Reform

By Charles M. Barclay

The following is an excerpt from a speech by Charles M. Barclay to the Aero Club of Washington on Nov. 18, 2014.

Before offering my one wish for aviation's future, allow me to recall a piece of history that I believe is highly relevant. In the 1970s and 1980s, an increasingly important question being debated was, "What's the proper governance structure for National and Dulles airports?" As part of the FAA at the time, the airports' ultimate "Board of Directors" was Congress, which as it turns out, had a lot of others things to do besides worry about giving focus and attention to running a couple of commercial airports. Of even greater impact, the capital-intensive airports had no access to capital finance and the bond market. Unlike all other airports in the U.S., they could not sell bonds to finance improvements over their useful life. If National airport needed a new $1-billion terminal – it did – the FAA executives had to try to get it from a single year's DOT appropriation… something they couldn't get, and wouldn't even dare ask for if they were smart.

In 1987, thanks to people like Jim Wilding, Elizabeth Dole, Norm Mineta, and many others, the Metropolitan Washington Airports Authority (MWAA) was formed. It gave the airports a focused board with authority to act on modernization and commercial operations, reliable financing, and access to the capital markets. That act created the professional, modern airports we know in Washington, D.C. today.

But ask yourselves, what would those airports look like today if they had continued to operate as a federal agency with annual appropriations financing, and now under sequestration? During the 1970s and early1980s, everyone with authority over the airports in FAA, DOT, and Congress were top-notch people who wanted the airports to succeed, but they didn't have the governance and finance tools to make it happen. MWAA is an under-celebrated success that we take for granted today.

So that brings me to a public policy question we started wrestling with decades ago, and one that is still unresolved after all this time. That question is about the proper governance structure for operating and financing our air traffic control (ATC) system.

My one wish for the aviation industry's future is that today's leaders successfully deal with "the one that got away" from my generation of aviation and government leaders – ATC reform.

The fundamental issues of governance and finance are identical to the National and Dulles airports' debate, despite the significant differences in scale and technology. Governance structure in this case comes down to whether or not you have the tools to deal with management authority, rapid change, major investment, and funding reliability. In those regards, ATC is in great need of reform – for the same reasons the microcosm of this debate, MWAA, required reform.

Air traffic control is a 24/7, high-tech, capital intensive "production line" of a major commercial industry. It is also a critical service provider to important private aviation interests

and the military. As you look around the federal government today, you can't find another production line of a major commercial industry. And for good reason – a high-tech, networked production line requires the continuous focus of an empowered board of directors, reliable funding, and capital finance.

I want to clarify that, for me, this question is not about philosophy or politics – rather, it is simply about providing the tools designed to achieve an organization's mission. We can't expect any institution – government or private – to do big, complex things it is not designed to do.

Imagine any modern commercial telecommunications network, another reasonable metaphor for our ATC system, trying to finance and keep pace with technology as a federal government agency under the annual appropriations process.

The people in FAA, DOT, and Congress responsible for ATC oversight, operations, and financing are not the problem. They are exceptional professionals doing their best in a governance structure that is missing the tools and incentives needed for a high-tech network's reliable financing and ongoing modernization.

Now, for those of you who have tuned me out, please tune back in for one moment. It's my wish that the federal government would continue to have two critical roles – roles we designed government to do.

The first is safety regulation. In the same manner that airlines and airports operate commercial services while the FAA regulates safety, and does it well, the same pattern would follow for ATC services.

The second thing government is designed to do and does well – frustratingly well, at times – is the protection of minority interests.

If I had to point to a single reason why ATC governance reform has not happened while other big issues of my generation were dealt with, it would be that some aviation constituents with minority economic influence over the ATC system fear their critical operational interests won't be safeguarded in a change. Worry about the fate of minority interests being protected is at least one major reason we haven't successfully dealt with ATC reform.

In my wish, we would recognize that air traffic control will always be a monopoly. So, no matter how we organize its operating and financial governance, some continued federal regulation of key rights and economic access to the system is an appropriate part of comprehensive oversight going forward. Day-to-day operations and financing are separate from those regulatory functions, and there are a number of models for designing both of those appropriate roles.

Obviously, my wish won't come true for the aviation industry without an agreement being hammered out by the industry's constituents to solve this Rubik's cube of interests, governance, finance, and regulation. That's hard. But, I think few people would argue that the record of modernization, as well as the prospect of future funding reliability, has earned air traffic control a presumption that the status quo structure is the best we can do – that it deserves to continue, unreformed.

I congratulate Administrator Huerta on his speech last October and subsequent agreement with industry on NextGen. Those are important steps to take at this time. But, to be clear, my wish is about something different. In my wish, the goal is not ATC modernization, but instead, continuous ATC modernization as an institutionalized, reliably funded, ongoing process.

I know the current crop of smart and talented leaders in aviation and government are up to the task of wrestling this one wish to conclusion at long last. ✈

About the Author

Over his four decade career, Charles M. Barclay became an acknowledged leader in the aviation industry, leaving an indelible mark on public policy through his roles in the top levels of government and as chief executive of the American Association of Airport Executives (AAAE). Barclay's career in public service began with the Civil Aeronautics Board and continued to the U.S. Senate, where he served as a senior professional staff member for the aviation subcommittee. Barclay was recently awarded the Donald D. Engen Aero Club Trophy for Aviation Excellence from the Aero Club of Washington.

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> My one wish for the aviation industry's future is that today's leaders successfully deal with "the one that got away" from my generation of aviation and government leaders – ATC reform.

Air Traffic Control Restructuring

Based on historical experience, a government-owned air traffic control entity would suffer from two opposite inclinations on the part of its political overseers: too little attention or too much attention.

The What and Why of It All

By David Grizzle,
Dazzle Partners

Following the hearings before the House Transportation & Infrastructure Committee and its Aviation Subcommittee on Nov.18, 2014 and March 24, 2015, a growing number of participants in the aviation industry have come around to the belief that something is going to happen to restructure air traffic control. What exactly should and will occur continues to be fiercely debated; but a consensus is growing around the proposition that something will be done to change the status quo.

The most striking testimony at the March 24 hearing came from Craig Fuller, speaking on behalf of the Management Advisory Council (MAC) of the Federal Aviation Administration (FAA).[1] Created by the Air Traffic Management System Performance Act of 1996, the MAC consists of 15 members all experienced in the field of aviation and appointed by the Secretary of Transportation.[2] One of the matters on which Administrator Michael Huerta asked the MAC to provide counsel was with respect to restructuring air traffic control. The prior MAC, which finished its work in 2013, had also looked at air traffic control restructuring and had concluded, among other points, that air traffic control should be separated from the rest of the FAA and funded by user-fees that bore some relationship to the cost of providing services.[3]

In a recommendation that was either a "see you and raise you" in poker or playing the trump in bridge, the MAC, as reported by Mr. Fuller, suggested that not only air traffic control but all of the FAA be structurally transformed. The MAC put forward the concept of a federal government corporation, with a private board to whom the administrator would report, that would oversee operations of the entire FAA, with the authority to decide down the road whether to move to user-fee funding and spin off the Air Traffic Organization – or not. The MAC called its proposal a "bold idea," and it certainly is. The MAC's proposal set many heads spinning, with some experts questioning whether it could actually be legal for the administrator, with all of his regulatory and enforcement power, to report to a private board. Irrespective of people's views about the feasibility of the MAC's proposal, its bold idea evidences clearly that even at the highest levels of the FAA there is consensus that transformative change is necessary if the FAA is going to deliver the safety, efficiency, and access that users of the National Airspace System (NAS) want and deserve.

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And when air traffic control is not ignored and receives intense attention, the focus is on political concerns, which are completely appropriate concerns for elected officials, but often have nothing to do with what is best for the critical operation of air traffic control.

Exploration of better ways to operate air traffic control is hardly a new fascination for Washington. The concept of stabilizing ATC funding by resorting to user fees dates back to the 1960s. Major restructuring of air traffic control outside of the rest of the FAA began in earnest during the Clinton administration, which Dorothy Robyn, a senior member of President Clinton's economic team, described in her testimony before the Aviation Subcommittee as "an effort that advanced the ball but failed to score a touchdown."[4]

Multiple times over the last 20 years, Congress has expressed its frustration with the performance of the FAA and its inability to modernize its equipment. In the Air Traffic Management System Performance Act of 1996,[5] Congress found that "In many respects the [Federal Aviation] Administration is a unique agency, being one of the few non-defense government agencies that operates 24 hours a day, 365 days of the year, while continuing to rely on outdated technology to carry out its responsibilities for a state-of-the-art industry."

The 1996 Act gave the administrator sweeping new powers to govern the agency with less external interference, almost in a non-governmental way, especially in the areas of personnel and acquisitions. Nothing

significant changed.

In 2003, another ineffectual effort was undertaken to reform air traffic control during the administration of President George W. Bush.[6] To use Ms. Robyn's imagery, again, the efforts failed to score.

So, the current inquiry is at least the third attempt in recent memory to find a way to transform air traffic control to enable it more nearly to fulfill the needs and expectations of the industry. At this juncture, three concepts have emerged:

- Preserve the status quo, perhaps with greater intentionality, with continued and perhaps intensified engagement by stakeholders like what has been provided by the MAC and the NextGen Advisory Committee under the auspices of Radio Technical Commission for Aeronautics (RTCA).
- Create a federal government-owned corporation to conduct the operations of air traffic control, or the entire FAA; and usually this concept comes with some degree of user-fee funding to insulate the enterprise more completely from the vagaries of the federal budgeting and appropriations process and with a board with lots or little authority comprised of members who are generally garden-variety political appointees with or without an

aviation background and with or without a Presidential appointment and Senate confirmation.
- Establish a non-stock, not-for-profit corporation to conduct the operations of air traffic control under the auspices of a board appointed by aviation stakeholders outside of the political appointment process and funded entirely by user fees supplemented by funds borrowed pursuant to the new entity's independent (i.e., without federal credit support) bonding authority.

Any effort to assign percentages of stakeholders among these three positions would be perilous. Most stakeholders hold their cards pretty close to their chest, waiting for others to speak first while taking a little more time to see more Congressional cards face up. It is obvious, however, that among those who strongly advocate change, they prefer a private not-for-profit corporation over a government owned and controlled corporation.

What would such a private entity look like, and why is it preferred by those who advocate significant change in how air traffic control is conducted in the United States? Having served for four and a half years in the FAA, with most of that time as the chief

operating officer and head of the Air Traffic Organization, I put myself squarely in the camp among those who believe that significant restructuring is necessary and that the not-for-profit option is the way to go.

Seven elements are essential to understanding this preferred alternative.

1 Structure

Congress would create a federally chartered, not-for-profit entity (which we will call "NewATO" here). NewATO would have no stockholders, but would be controlled by its board of directors – similar to the American Red Cross. NewATO would be independent of the federal government except for safety oversight and appeal of the rates NewATO charges for use of the system. A not-for-profit structure is preferred over a for-profit entity for several reasons. The not-for-profit corporate form reduces concerns that the operator might cut corners either in safety, employee care, or access, merely for the sake of enhancing stockholder returns. It also addresses anxiety about excessive rates and charges, because there would be no value leakage from the enterprise to incentivize generating income above what is required to provide efficient access. Finally, not-for-profit entities are intrinsically multiple bottom-line organizations. It is in their nature to balance the multiple values of safety, efficiency, and access.

But, why not create a government-owned corporation, like Amtrak or the United States Postal Service? Many developed countries manage to accomplish significant tasks with government corporations. We don't seem to do so well here. Based on historical experience, a government-owned air traffic control entity would suffer from two opposite inclinations on the part of its political overseers: too little attention or too much attention.

In the 2003 Congressional effort to improve the performance of air traffic control, Congress created the Air Traffic Services Committee, a Presidential-appointed, Senate-confirmed board of directors for the Air Traffic Organization. The committee had quite significant power, including approval of ATO strategic and modernization plans and of all acquisitions over $100 million. The committee was also supposed to make budget recommendations. No sooner had the ink dried on the legislation than the committee began to be ignored. Its vacancies were not filled and soon it ceased to meet and, despite its authority continuing to exist in current law, it was ignored; all of the intentional insight it should have provided was disregarded and forgotten.

Would the board of directors of a government-owned air traffic entity receive more consistent attention than the ATSC received? Perhaps not. For most of the time, air traffic control is not a policy-rich environment. It is a hardcore, 24/7/365 operation that simply isn't interesting to those who have principally political responsibilities. So, it tends to be ignored.

And when air traffic control is not ignored and receives intense attention, the focus is on political concerns (such as the location and dimension of facilities and the winner of procurement contracts), which are completely appropriate concerns for elected officials, but often have nothing to do with what is best for the critical operation of air traffic control.

To form a government-owned air traffic control entity, almost all of the thorny issues associated with any restructure must still be addressed (user-fee levels, asset transfers, and employee-benefit programs). But history shows us that even if we resolve all of those issues, the combination of too little attention punctuated by too much inappropriate attention from our political leaders will leave us with a generally unimproved operation.

2 Board Composition and Governance

NewATO would be controlled by a board of directors, whose members are designated by stakeholders who have a continuing, substantial interest in air traffic control. The board will appoint the chief executive officer. The board should certainly include representatives of users of the system who depend upon it and the employees who make it happen. It may also include representatives of other constituencies that have a substantial interest in the operation. Critically, with few exceptions, members of the board should be appointed by private stakeholders who pursue no objective in making their appointments other than the best interests of the enterprise and the quality of its operation. The board would, for the most part, not be political appointees. All members of the board should have a fiduciary duty to the new entity that is unencumbered by any employment or other connection with the stakeholder representative that appointed them. To take the commercial airlines as an example, the board members designated on their behalf by Airlines for America could not be employees or directors of a commercial airline or Airlines for America.

3 Assets Acquisition

NewATO must completely control its assets, most likely through a purchase, so that it is free from interference (except for safety oversight) as it makes decisions to eliminate obsolete assets and increase efficiency and performance. NewATO should acquire all assets currently deployed by the FAA's Air Traffic Organization and the NextGen Organization, but also shared assets on which these organizations currently depend, and a part of the Aeronautical Center and most, if not all, of the Technology Center.

NewATO should pay a fair price. Because these assets are unique, there are no clear benchmarks such as book value, fair market value, or replacement cost that can be used; the price will have to be determined using good judgment and the application of sound valuation principles. A significant factor in determining the price should be a consideration of how we want NewATO to use its capital: to pay for old assets or to develop and deploy new ones. NewATO will have access to substantial, well-priced capital because of its market position and its ability to borrow money through the issuance of both revenue- and asset-backed securities. NewATO will receive no credit support – explicit or implied – from the federal government.

There is some angst about whether we can get the price right for the assets. The price-determination process should be done deliberately and professionally. But, if the price is inadvertently too low, the only people who will benefit from the underpricing will be the users, passengers, shippers, and communities who basically paid for the assets in the first place through aviation taxes.

4 Employees

It is essential that the current employees who conduct the operations that move to NewATO not be subjected to risk and uncertainty. Their pay and benefits, as well as their pension expectations, should be maintained. NewATO will need to consider more modern benefit structures going forward, but only for future employees who will then be able to make their employment decisions based on the benefits they are offered at the time. The collaborative environment and processes between management and labor that have been developed in the Air Traffic Organization over the last five years must be preserved by NewATO.

5 Revenue

NewATO should be funded principally through fees paid by users of the system, based on formulas that are transparently determined and easily calculated, which cover NewATO's operating and capital costs. In order to avoid the risk of future "double taxation," all existing aviation taxes should end at the same time user fees begin. NewATO should not rely upon the federal government for any financial support, except for potential fees for services rendered by the new entity. Military flights operated by the federal government will be exempt from user fees.

6 Regulation

Air traffic control operations will continue to receive safety oversight from the FAA. Contemporaneously with the creation of the new entity, significant steps should be mandated to move the FAA more completely to a performance-based mode of oversight, consistent with the safety risk management systems the industry and the Agency are implementing. Users would be able to appeal to the federal government increases in rates and charges that they consider unreasonable in light of the needs and services of the new entity.

Some have expressed concern about whether the current level of safety will be maintained if the operator and the regulator are separated. Safety should increase as the division of labor between NewATO and the regulatory side of the FAA is clarified, as visibility into safety processes (such as new route design) is increased and, consequently, greater accountability is possible. Today, even when the industry senses that something is not working right between the ATO and the regulatory part of the FAA, they don't know whom to blame.

7 Transition and Scale

Although air traffic control constitutes a large civilian government operation, as private-sector entities go, it is not massive; each of the four major airlines in the U.S. is at least three times the size of the air traffic control operation. Operating a safety-intensive enterprise of the scale of NewATO will not constitute the treading of any new ground. At the same time, because of the criticality of NewATO's safety mission, the transition from government to stakeholder control should be done over sufficient time to attend to details, discover unforeseen challenges and to permit the industry to adjust to new methods. Benchmarking against other transactions of comparable scale and complexity, a two-year transition consisting of two or more distinct phases properly balances the need for prompt change with the avoidance of organizational risk.

Fortunately, on its first day of operations, NewATO will already be a fully scaled-up operation, with hundreds of facilities, complete management and labor leadership, supply chains and contract support – all available to be more productively leveraged with predictable and more generous funding and governance that respects the peculiar demands of this critical operation.

Conclusion

It seems that about every 10 years, Congress gets energized about restructuring air traffic control. We are now in the midst of this decade's efforts, and there is evident momentum. We may not succeed, though. If we fail this time, no doubt the efforts will be repeated again a decade from now, at which time our current NextGen implementations will then be running technology that is more than 20 years old. We can always start the "next NextGen," but we might not be able to regain the global technical leadership in ATC that will have been forfeited if we do not seize the current opportunity. ✈

References

[1.] http://transportation.house.gov/uploaded-files/2015-03-24-fuller.pdf

[2.] Although members of the MAC were to have been Presidential appointed, Senate confirmed, that burdensome provision was subsequently deleted in favor of appointment by the Secretary of Transportation.

[3.] "FAA and Aviation Policy Reform: Now is the Time," FAA Management Advisory Council, Joint Meeting of MACs. January 29, 2014. Stephen D. Van Beek, Ph.D.

[4.] http://transportation.house.gov/uploaded-files/2015-03-24-robyn.pdf

[5.] PUBLIC LAW 104–264

[6.] Congress created the Air Traffic Services Committee, a Presidential-appointed, Senate-confirmed board to oversee the system. The Committee's responsibilities included approval of ATC strategic and modernization plans and of all acquisitions over $100,000,000. The Committee was also supposed to make budget recommendations. It was allowed to fall into complete disuse, with its vacancies unfilled in a decade, with no meetings and no execution of its responsibilities, even though its required role is still current law.