

The Need to Reform FAA and Air Traffic Control to Build a 21st Century Aviation System for America

Testimony of Dorothy Robyn

House Committee on Transportation & Infrastructure

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Chairman Shuster, Ranking Member DeFazio and distinguished members of the Committee. I appreciate the opportunity to testify this morning on reform of the U.S. air traffic control system.

I have an MPP and Ph.D. in public policy from the University of California, Berkeley, and have spent more than three decades—in academia, government and consulting—working on economic and regulatory policy, much of that work focused on aviation, transportation and infrastructure. For the full eight years of the Clinton Administration, I served as a Special Assistant to the President for Economic Policy, on the staff of the White House National Economic Council. During President Clinton’s second term, and after the Administration’s proposal to corporatize air traffic control had failed to garner congressional support, I worked extensively on alternative options, culminating in the President’s issuance in December 2000 of an executive order directing the FAA to establish the Air Traffic Organization as a performance-based entity separated internally from the FAA’s regulatory function. After leaving the White House, I continued to work on aviation policy, first as a Guest Scholar at the Brookings Institution and then as an economic consultant with the Brattle Group. I informally advised CSX CEO (and later Secretary of the Treasury) John Snow, the chair of the Air Traffic Services Subcommittee, which was created to serve as a board of directors for the ATO. I analyzed air traffic control financing and governance issues for the Department of Transportation’s Office of Inspector General,¹ the White House Council of Economic Advisers,² and Brookings’ Hamilton Project.³ I also worked on the first phase of an FAA-supported study of the total cost of flight delays before leaving the Brattle Group to join the Obama Administration.

After five years as an Obama Administration official at the Department of Defense and the General Services Administration,⁴ in 2014, I reengaged in aviation policy as an independent analyst and a member of the Eno Center for Transportation’s NextGen Working Group. I have written several opinion pieces on air traffic control reform,⁵ and I coordinated with former

¹ Dorothy Robyn, “Give Price a Chance: Financing the Air Traffic Control System to Promote Efficiency,” April 2005 (unpublished); and “Proposal to Spin Off the FAA’s Facilities and Equipment Activities: A Preliminary Analysis of Unintended Consequences,” October 2006 (unpublished).

² Dorothy Robyn in association with GRA, Inc., “Reforming the Air Traffic Control System to Promote Efficiency and Reduce Delays,” Prepared for the Council of Economic Advisers, Brattle Group, October 2007.

³ Dorothy Robyn with support from Kevin Neels, “Air Support: Creating a Safer and More Reliable Air Traffic Control System,” Hamilton Project, Brookings Institution (July 2008); available at: <http://www.brookings.edu/research/papers/2008/07/air-traffic-robyn>.

⁴ I served as the Deputy Under Secretary of Defense for Installations & Environment (2009-2012) and (following the scandal at GSA) the Commissioner of GSA’s Public Buildings Service (2012-2014).

⁵ See: “Alternative Governance Models for Air Traffic Control System: a User Cooperative Versus a Government Corporation,” April 6, 2015; available at: <https://www.brookings.edu/blog/fixgov/2015/04/06/alternative->

colleagues in the Clinton Administration on a letter in support of corporatization of air traffic control (see Appendix). Most recently, a former Brattle Group colleague and I conducted an extensive analysis of satellite-based aircraft surveillance (“space-based ADS-B”). Our report, released in January, identifies the potential economic benefits of this new capability and makes recommendations on how the FAA should think about its costs and benefits.⁶

Background

The United States has the busiest and safest airspace of any country. The ATO, made up of 14,000 controllers and 20,000 engineers and other staff, orchestrates the safe transit of more than 30,000 commercial flights a day—an extraordinary feat. I have worked with many FAA analysts, engineers and managers over the years, and (like the federal employees I worked with at DoD and GSA) they are extremely talented and mission-driven. Although I have never worked alongside air traffic controllers, last year, I attended NATCA’s annual safety conference, the culmination of which was the presentation of the Archie awards to controllers who had performed extraordinary life-saving feats the prior year. Listening to the audio recordings of rock-steady controllers, as they calmed and guided general aviation pilots who had lost their way or were coping with a mechanical catastrophe, was an experience I will not soon forget.

Despite this talent pool, and the skill with which it manages the day-to-day operation of the air traffic control system, the ATO faces longstanding structural problems. In response to these problems, in 1995, the Clinton Administration proposed to transfer the air traffic control system to a wholly owned government corporation, the U.S. Air Traffic Services Corporation (USATS), which would be managed by a board of directors and a CEO, financed by user charges that could be leveraged to borrow from the Treasury or (potentially) private capital markets, and overseen by an independent safety regulator (the residual FAA). USATS was dead on arrival in Congress, however, with some Members saying it went too far and others saying it did not go far enough.

At the time, only four countries—the UK, Germany, Australia and New Zealand—had moved their air traffic control system outside of the traditional government bureaucracy; now, some 60 countries have done so. The United States is one of the few industrial nations that still provides air traffic control services out of a traditional government agency.

The Problem: Air Traffic Control is a Business Trapped in a Regulatory Agency

I describe the problems facing the ATO in detail in the Brookings Hamilton Project paper as well as my 2015 testimony before the House Aviation Subcommittee which drew heavily on that report.⁷ Let me distill my analysis down to three key points.

[governance-models-for-the-air-traffic-control-system-a-user-cooperative-versus-a-government-corporation/](#); “It’s Time to Corporatize Air Traffic Control (the Right Way),” September 28, 2015; available at: <https://www.brookings.edu/blog/fixgov/2015/09/28/its-time-to-corporatize-air-traffic-control-the-right-way/>; and “Corporatize Air Traffic Control: a Democrat’s Case”; available at: <http://www.realclearpolicy.com/blog/2016/02/09/corporatize-air-traffic-control-a-democrats-case-1549.html>.

⁶ Dorothy Robyn and Kevin Neels, “Warranted Surveillance? Evaluating the Economic Case for Space-Based ADS-B,” January 2017; available at: <http://ow.ly/eCEE308xMRT>. See also Robyn and Neels, “Warranted Surveillance?,” *Air Traffic Management*, Issue 1 2017; available at: <http://www.airtrafficmanagement.net/2017/05/warranted-surveillance/>.

⁷ Available at: <https://transportation.house.gov/uploadedfiles/2015-03-24-robyn.pdf>.

First, air traffic control is not an inherently governmental function. Although keeping planes safely separated is a complex and critical task, it is a purely operational process that follows well-established rules. Like running an airline or manufacturing a Boeing 787, air traffic control can be performed effectively by a non-governmental entity as long as it is subject to oversight by FAA safety regulators, whose job of setting and enforcing the rules *is* inherently governmental.

Historically, the air traffic control operator and the safety regulator were seen as so closely linked that the former was assumed to be inherently governmental. We now know that is not the case, as evidenced by the dozens of countries that have opted to provide air traffic control services through a self-supporting, autonomous agency outside of the traditional government bureaucracy. In fact, as discussed below, experts now call for the separation of the regulator from the operator in order to *ensure* system safety.

Second, precisely because air traffic control system is commercial in nature, the federal government is poorly suited to running it. Blue-ribbon commissions have studied the FAA in depth for decades, and there is a broad consensus on the problem. *Air traffic management is a 24/7, technology-intensive service “business” trapped in a regulatory agency that is constrained by federal budget rules, burdened by a flawed funding mechanism, and micromanaged by Congress and the Office of Management and Budget.*

To paraphrase James Carville, “It’s the incentives, stupid.” Because it relies on appropriated funds, the FAA views Congress rather than aircraft operators — and the traveling public — as its customer, and Congress intervenes in decisions large and small. For example, Members concerned about the loss of jobs in their district have long blocked FAA plans to consolidate aging and inefficient facilities that would save hundreds of millions of dollars a year.

The FAA’s funding mechanism compounds the governance problem. Air traffic control is paid for largely through an ad valorem ticket tax on passengers rather than a cost-based charge on aircraft operators, whose scheduling decisions and operational practices determine the workload on the system. This indirect funding mechanism distorts aircraft operators’ decisions and lessens the FAA’s incentive to respond to the needs of its real customers.

The budget process is another millstone around the ATO’s neck. Because the federal government lacks a capital budget, the FAA cannot borrow against annual receipts to fund long-term investments in new technology and facilities.⁸ Nor can it finance promising new capabilities that have the potential to transform the delivery of air traffic control services as I discuss below using the example of space-based ADS-B.

These problems are most evident in the FAA’s long-running struggle to deploy new technology that would improve efficiency and make air travel safer. When it undertook to modernize the air traffic control system in 1981, the FAA estimated that the work would cost \$12 billion and take a decade to complete. Thirty-six years and more than \$56 billion later, many controllers still keep track of aircraft using paper strips. Outdated technology limits the capacity of the system,

⁸ Having run GSA’s Public Buildings Service and had DoD-wide management oversight of U.S. military bases, I have experienced firsthand the challenges of acquiring and maintaining large capital assets under the constraint of the federal government’s requirement for up-front funding of capital investments. See Dorothy Robyn, “Reforming Federal Property Procurement: The Case for Sensible Scoring,” Brookings Institution, April 29, 2014; available at: <http://www.brookings.edu/blogs/fixgov/posts/2014/04/24-federal-property-procurement-sensible-scoring-robyn>.

contributing to flight delays and increased flight times. It also helps to explain why the FAA's cost per unit of service has gone up by more than 66 percent since 1997.

Third, the current arrangement is flawed on safety grounds. Historically, civil aviation authorities in most countries both operated and regulated air traffic control, leading to potential conflicts of interest. Safety experts worldwide, including the International Civil Aviation Organization, are unanimous in saying that the air traffic control regulator should be independent of the operation it regulates to avoid such conflicts. In fact, many of the countries that have spun off air traffic control have done so largely for safety reasons. The United States is one of the only industrial countries in which air traffic control is still both operated and regulated by the same agency.

Although safety experts have long recommended it, independent regulatory oversight of the air traffic control operator is becoming even more important as we transition to the next generation of air traffic control technology. According to a 2007 joint statement by the late Alfred Kahn, former FAA Administrator Langhorne Bond, and seven other aviation experts, "as the ATO moves forward to implement the dramatic changes in technology and procedures inherent in the NextGen concept...[m]any decisions about increasing capacity by reducing aircraft spacing (thanks to new technologies and procedures) have important safety implications, and should be arrived at in a transparent manner. Arm's length separation cannot be accomplished as long as ATO operations and aviation safety regulation reside in the same governmental unit."⁹

Far-Reaching Benefits of Corporatization and Cost-Based Pricing

Although the creation of the ATO was a step in the right direction, it did not go far enough. To correct the ATO's problems, Congress needs to move the ATO out of the federal government and make it a stand-alone entity run by a CEO and a board of directors, with the FAA providing independent safety oversight. In addition, Congress should replace tax funding of the air traffic control system with cost-based prices on commercial and business aircraft. To minimize transactions costs and reflect their lower demand on the system, piston-engined aircraft, many of which operate out of separate and uncongested facilities, should pay a flat annual charge linked to aircraft size.

These two changes would have far-reaching beneficial effects on the air traffic control system over time. First, the spin-off of the ATO would eliminate the potential conflict of interest by replacing the current arrangement, in which the FAA both operates and regulates the air traffic control system, with one in which the FAA provides independent, arm's length regulation of the system operator. As noted above, this long-needed change is becoming even more critical as the system shifts to satellite-based technology, which allows for closer spacing of aircraft.

Second, the separation of the ATO from the FAA would clarify the missions of the two entities. The ATO is a large organization with a distinct, operational function. Making the ATO a stand-alone operational entity would help employees to see their job as that of a (safety-obsessed) service provider—a challenge currently.

Allowing the FAA to focus exclusively on safety regulation should improve its performance as well. Realistically, the FAA will need to beef up its oversight of the air traffic control system once it can no longer rely on the ATO's (much larger) internal safety office, and transparency

⁹ "The Need for Fundamental Reform of Air Traffic Control," September 19, 2007. See: http://reason.org/files/air_traffic_control_experts_statement_2007.pdf

may require more, not less, interaction between the FAA and the ATO on NextGen. Such scenarios should not be cast in a negative light, however: the goal is to ensure the optimal tradeoff of safety and system capacity, not to constrain NextGen planners' in-box.

Third, the ability to borrow money will allow the ATO to undertake capital investments sooner and assign some of the costs to future users, consistent with economic efficiency. At the same time, it will force the ATO to convince investors that its capital spending plan is sound. In this way, the capital markets will impose a healthy discipline that OMB and Congress cannot match.

Fourth, adoption of a well-designed system of pricing (i.e., user fees) will provide valuable market signals, incentivizing aircraft operators to use air traffic control capacity more efficiently, encouraging the ATO to offer services that best meet users' needs, and promoting innovation and long-term investment. Pricing will also facilitate customer involvement, by giving users an incentive to monitor ATO spending and the ATO an incentive to consult more closely with users.

A "User Cooperative" versus a Government Corporation

Although most countries have transferred responsibility for air traffic control to a government corporation, the Canadians created a different model: NAV CANADA is a private, non-profit corporation governed by a stakeholder-selected board; it is similar to the user-owned cooperatives seen in many sectors (e.g., insurance, agriculture and utilities). Since both approaches provide for independent safety regulation, the decision should come down to economic performance. In my view, it is not a close call: the NAV-CANADA model is superior to the government-corporation model in both theory and practice.

In theory, NAV CANADA achieves an elegant alignment of incentives: because the board represents stakeholders, it governs the air traffic control system so as to keep costs low and invest in capital at the optimal level. This simple design solution creates an incentive for efficient performance in the absence of competition, and it eliminates the incentive for monopoly abuse. Although the government participates as a member of the board (and serves as an independent safety regulator), its involvement in the private system can otherwise be minimal.

Beyond representing stakeholders, the board has a fiduciary responsibility to NAV CANADA. Toward that end, while some board members have aviation expertise, others are selected for their knowledge of finance, human resources, law and other areas relevant to running a business. Having board members who are fiduciaries has been essential to NAV CANADA's success.

NAV CANADA's 20-year track record is practical proof that its approach works. User charges are a third less in real terms than the ticket tax they replaced. The system is handling 50 percent more traffic with 30 percent fewer people. And it has fully modernized its equipment with half the prior level of capital expenditure and in fact now sells its hardware and software to other providers. Canadian air traffic controllers support NAV CANADA because it rewards productivity and involves controllers intimately in the technology modernization process.

In contrast to NAV CANADA, a government-corporation approach to air traffic control requires ongoing government involvement to achieve the same economic goals. Although this approach has worked well in many countries, the structure alone is no guarantee that a government corporation will not seek to abuse its monopoly power. The European Commission has imposed its own regulatory scheme to promote efficiency and discourage monopoly pricing on the part of Europe's national air traffic control providers, many of which are government corporations.

An even bigger concern in this country may be the potential for *unwarranted* government involvement. Government corporations in the United States do not have the same degree of political insulation as those in other countries. If a corporatized air traffic control system is to succeed, it must be shielded from unwarranted external intervention, and it seems doubtful that a government corporation could provide that bulwark.

Had NAV CANADA existed in 1995, I suspect that it, rather than New Zealand's government corporation—the best model at the time—would have been the prototype for the Clinton Administration's USATS proposal. And in 2000, when the Clinton Administration designated five outstanding business and management leaders, several of whom had no aviation expertise, for appointment to the Air Traffic Services Subcommittee, it did so with an eye to Canada's nascent approach. I personally recruited John Snow because he was a corporate executive, trained as an economist, who understood network industries.

An FAA Corporation: Fatally Flawed Twice Over

Some people have called for transferring the FAA in its entirety to a government corporation (one variation of this proposal would transfer only those regulatory functions related to air traffic control). While the goal of giving both sides of the FAA greater flexibility is laudable, this approach is flawed in fundamental ways. First, by keeping the air traffic control operator and the regulator in the same organization, it fails to address the conflict-of-interest issue. Even more problematic, an FAA Corporation would corporatize the FAA's regulatory functions, which *are* inherently governmental. Air traffic control users, through their membership on the board of the corporation, would have some authority to oversee safety regulation—a clear conflict of interest. Moreover, the CEO and the board would be directly accountable to the Executive Branch and Congress for that portion of the corporation's funding devoted to regulatory oversight, which would significantly diminish the corporation's independence and flexibility.¹⁰

Objections to “Privatization”

Those who oppose the adoption of a NAV-CANADA model in the United States cite several reasons that the air traffic control operator should remain in the federal government (in either a government corporation or a traditional government agency). One reason is national security. A major concern is that the military conducts operations whose whereabouts cannot be broadcast without risk of compromising the government's objectives. But private contractors are *already* responsible for carrying out essential air traffic control functions, such as automatic dependent surveillance-broadcast (ADS-B), the successor to radar surveillance. The procedures now in place to ensure that such operations are kept secret can easily move with the ATO when it transitions to a corporate structure, as long as the federal government retains an “appellate” function.¹¹ Moreover, in the event of war, under this committee's proposed legislation, DoD would take over the operation of the national airspace system (NAS), just as it would under current law.

¹⁰ The FAA Corporation was one of the options examined as part of the Clinton Administration's six-month, DOT-led interagency analysis of the air traffic control system. “Air Traffic Control Corporation Study,” Report of the Executive Oversight Committee to the Secretary of Transportation, May 1994, pp. 55-56.

¹¹ Currently, if, say, DoD has a disagreement with the private ADS-B provider, it can elevate the issue to ATO management. That “appellate” function needs to remain in the government—presumably in the residual FAA.

To be sure, DoD has major equities in the NAS, and it will need assurances that the new structure will preserve current DoD-ATO arrangements and address potential risks and contingencies. However, a NAV-CANADA type of corporatization of the ATO could bring significant benefits to DoD, such as facilitating investment in military-run air traffic facilities and equipment that DoD lacks the capital budget to upgrade. In short, national security does not appear to be a reason to oppose “privatization.”

A second objection to “privatization” has to do with the environment. The major concern seems to be that communities will have less ability to affect decisions about where planes fly and the resulting noise impact. While aircraft noise is a genuine issue, particularly with the advent of performance-based navigation, the spinoff of the ATO would not change the underlying environmental law or policy. The National Environmental Policy Act would still apply, and the FAA would retain the (inherently governmental) responsibility for approving new flight paths, revised air traffic control procedures and other changes with potential environmental impacts.

Finally, some stakeholders have questioned whether the NAV-CANADA model is scalable to an aviation system as large and diverse as the one in this country. However, the U.S. air traffic control system is already large, and there is nothing about the Canadian approach that limits its scale. To the contrary, the larger and more complex the system, the more important it is to have a commercially driven operator, particularly one with built-in incentives for efficiency. As for “diversity,” meaning the ability of small airports and the general aviation users who rely on them to access the air traffic network, as a non-profit corporation in which stakeholders are the “owners,” the ATO would treat access as a bottom-line goal (along with efficiency and safety).

Satellite Surveillance

Finally, let me briefly discuss a new air traffic control capability, space-based ADS-B, whose brief history illustrates the constraints that the ATO faces as a government agency. By way of background, although radar and (ground-based) ADS-B track aircraft in real time, allowing planes to be separated by only 3-5 nautical miles, their coverage is limited to the airspace over land. In the airspace above oceans and remote land areas, which cover 70 percent of the earth, controllers must rely instead on infrequent position reports from the aircraft, which requires that planes be separated by 30-120 nautical miles. With space-based ADS-B, next-generation Iridium satellites equipped with ADS-B receivers will take the place of ground-based infrastructure, making it possible to track airplanes with radar-like precision anywhere above the earth’s surface.¹²

Space-based ADS-B is a potentially transformative technology that will allow for safer and more efficient use of the 70 percent of global airspace that lacks radar-type surveillance. In addition to allowing for closer spacing of aircraft in high-traffic areas like the North Atlantic, space-based ADS-B will be a valuable security asset, enabling DoD and U.S. intelligence agencies to monitor global traffic flows in real time and more easily land military aircraft in war zones and disaster areas that lack air traffic infrastructure. It will make lengthy search and rescue operations, such

¹² In January, SpaceX launched a rocket carrying the first ten Iridium NEXT satellites, and the others are due to be deployed over the next 18 months. In addition to Iridium, Globalstar plans to offer space-based ADS-B service. Globalstar’s system (unlike Iridium’s) will require aircraft to install additional equipment and will lack complete global coverage.

as the one for Malaysian Airlines Flight 370, a thing of the past.¹³ Over the longer term, space-based ADS-B could even alter the current approach to air traffic control, allowing monopoly national providers, armed with a common, global air picture, to compete as well as collaborate.

In 2010, in an effort to raise the capital to add ADS-B receivers to its next generation of satellites, Iridium asked the ATO to be the initial investor in a joint venture to provide space-based ADS-B as a service to individual air traffic control providers. As a traditional government agency, the ATO could not seriously entertain such a proposal. Lacking such a constraint, NAV CANADA pledged \$150 million to become a 51 percent owner of the joint venture, Aireon, and the air traffic control providers in Ireland, Denmark and Italy committed to an additional \$120 million in equity, making Aireon 75.5 percent owned by foreign air traffic control providers.

Iridium is an American success story. In 2000, the company survived a bankruptcy that almost led to the destruction of its 66-satellite network—an engineering marvel that uses Star Wars technology to link any two points on the planet. Since 2001, Iridium satellite phones have saved tens of thousands of lives and proved indispensable in war zones, disaster areas, and for hundreds of commercial and scientific uses in parts of the globe that are otherwise inaccessible. As Aireon writes a new chapter in the Iridium story, one wishes it were bolstering our country's once-unquestioned technological leadership in aviation and air traffic control; instead the Aireon board meets in Ottawa.

Nor is it certain that the ATO will decide even to subscribe to space-based ADS-B as a customer, in part because of constraints it operates under. Although the charge for Aireon's service would be relatively modest, the ATO cannot pass the cost on to aircraft operators, as other air traffic control providers plan to do. And since the FAA's appropriations have been flat for five years—a trend that is likely to continue—to take on a new commitment, the ATO must jettison an old one. Thus even if the ATO's benefit-cost analysis of space-based ADS-B is positive (an ongoing analysis whose result I do not presume to know), the budget and other constraints may limit the ATO's ability to take advantage of this potentially transformative new capability.¹⁴

That concludes my statement. Thank you again for the opportunity to testify on this important issue. I look forward to answering any questions you have.

¹³ If a commercial aircraft flying in oceanic airspace is reporting its position every 15 minutes (the current norm), the search area if the plane disappears is about 55,000 square kilometers. By contrast, with the 8-second update rate that space-based ADS-B will provide, that search area is only 4 square kilometers.

¹⁴ See Dorothy Robyn and Kevin Neels, "Warranted Surveillance: SpaceX Satellite Launch Holds Promise for Air Traffic Control," January 17, 2017; available at: <https://www.brookings.edu/blog/fixgov/2017/01/17/warranted-surveillance-spacex-satellite-launch-holds-promise-for-air-traffic-control/>.

Appendix

April 7, 2016

Members of the U.S. Senate

Re: Support for Air Traffic Control Reform from Former Clinton Administration Officials

Dear Members of the U.S. Senate:

In recent weeks, Congress has begun consideration of legislation to reform the structure and financing of the Federal Aviation Administration's Air Traffic Organization. One leading proposal would move the ATO to a non-profit corporation that would be financed by users and regulated for safety at arm's length by the FAA. We believe this type of reform is needed. Numerous expert panels and studies have recommended "corporatization" of air traffic control, and both Democratic and Republican Administrations have proposed it in the past.

We participated in the effort by President Clinton and Vice President Gore to move air traffic control to a government corporation, so that it could operate more like a business and borrow on the capital markets to finance long-term capital investments. A key goal was to accelerate the FAA's effort to modernize its system by (among other things) shifting from 1950s-era ground-based radar to satellite-based navigation—an effort that was plagued by delays and cost overruns.

Two decades later, delays and cost overruns continue to plague the FAA's effort to adopt next-generation satellite-based technology (NEXTGEN), and air traffic controllers still keep track of aircraft using paper strips. In recent years, uncertainty as to the magnitude and timing of federal funding for NEXTGEN—a problem that is likely to get even worse—has added to the FAA's challenges.

Additional evidence that the Clinton Administration was right to pursue air traffic control reform comes from the actions of other countries. Two decades ago, only four countries had corporatized their air traffic control systems. Today, more than 60 other countries have done so. A dozen independent studies by the Government Accountability Office and others show that, after the change, air traffic control safety in these countries improved or remained the same and efficiency increased.

This letter is not meant as a plea to support a particular piece of legislation. Rather, our intent is to communicate the importance of structural reform of air traffic control, generally, and to make it clear that Democrats and Republicans alike have long advocated such reform.

We are heartened by the support for reform shown by the National Air Traffic Controllers Association, which represents 17,000 FAA employees.

Air traffic control reform is long overdue in this country. We hope it will receive bipartisan support in Congress.

Sincerely,

Federico Pena
Secretary of Transportation, 1993-1997

Norman Mineta*
Secretary of Transportation, 2001-2006

Peter Orszag**
Director, Office of Management and Budget, 2009-2010

Joshua Gotbaum***
Senior Official in the Departments of Defense and Treasury and the Office of Management and Budget, 1993-2001

Elaine Kamarck
Director, National Performance Review, 1993-1997

Dorothy Robyn***
Special Assistant to the President for Economic Policy, 1993-2001

Gerald Baliles
Governor of Virginia (1986-1990) and Chairman of the 1993 National Commission to Ensure a Strong Competitive Airline Industry

*Mineta served as the Secretary of Commerce in the Clinton Administration

**Orszag served in several senior economic advisory positions in the Clinton Administration

***Gotbaum and Robyn also held senior political positions in the Obama Administration