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By Vaughn Cordle and Robert W. Poole, Jr.
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POLICY STUDY 332

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Executive Summary

The air traffic control system is faced with a major funding crisis, which puts at risk ambitious plans to double or triple the system's capacity over the next 20 years. Just over a year after the start-up of the reorganized Air Traffic Organization (ATO), its ability to modernize the system is seriously threatened.

The immediate cause of this crisis is dramatic reductions in average airline fares, brought about by the low-cost-carrier (LCC) revolution of the past five years. Intensified competition from LCCs has forced large reductions in most airfares. But since the major funding source for the ATO is a 7.5 percent tax on the price of airline tickets, the ATO's projected revenue over the next 5, 10, and 20 years is many billions less than expected and needed. And in the current airline financial climate, increasing taxes on this beleaguered industry is simply not an option.

Therefore, it is time to rethink the way we pay for air traffic control. It turns out the United States is the last remaining developed country to use a ticket tax for this purpose. Nearly all other countries follow the guidelines of the International Civil Aviation Organization (to which the United States is a signatory) and charge aviation users directly for air traffic services. Indeed, the 1997 Mineta Commission report, which led to the creation of the ATO, strongly recommended that funding for the new ATO be based on payments for air traffic services, paid directly by aviation users to the ATO. The Mineta Commission pointed out that in addition to creating a stronger customer/provider relationship, such direct user payments would constitute a bondable revenue stream. That would permit funding air traffic control modernization by issuing long-term revenue bonds, rather than via annual appropriations.

This study recommends that Congress make the ATO a self-supporting unit of the FAA, by authorizing it to charge aviation users directly for its services. The ATO would also be authorized to raise money for capital spending (modernization) by issuing long-term revenue bonds in the capital markets. The FAA's safety regulation and miscellaneous other functions would still be supported, as they are now, by $2 billion per year of general fund monies. And the airport grants program (AIP) would be supported by a modest tax on airline tickets and cargo waybills (in the vicinity of 1 percent).

The transition period to bond-funding of modernization would produce net savings to airlines of hundreds of millions of dollars per year, especially in the early years. At the same time, modernization would be accelerated, thanks to the ability to raise large amounts up front to finance capital expenditures for which there was a demonstrated business case. Modernization plans would first have to be approved by a new ATO Board, consisting largely of aviation stakeholders. This Board would also determine the structure of the new charges for air traffic control services.

We recommend that only that small segment of general aviation which makes extensive use of air traffic control services—jets and turboprops—pay fees under the new system and be represented on the stakeholder board. The large majority of piston-powered general aviation would continue to pay the aviation fuel tax, which would help to support the airport grants program. And we consider the Flight Service Station program used by general aviation to be basically a safety function, which should be paid for out of FAA's safety budget; in no cases should there be user fees for those services.

There is a real window of opportunity for reforming the way we pay for air traffic control:

- The funding crunch urgently needs addressing, before serious harm occurs thanks to the aging and deteriorating ATC infrastructure.
- The new ATO needs the basic tools the Mineta Commission recommended, especially a dependable, bondable revenue stream that is not constrained by federal budget problems.
- New technology, combined with the impending retirement of more than half the controller workforce, offers a one-time opportunity to change the way air traffic is managed, permitting a huge increase in capacity without increasing the workforce.
- The ATO will soon have in place the cost-accounting system, which is a precondition for developing cost-based charges for its services.
- The current aviation taxes sunset in FY 2007, making their replacement an urgent topic for debate this year.

We are proposing a dramatic change, but it's no less dramatic than the change Congress authorized 20 years ago for the Washington, D.C. airports. Like the ATO, Dulles and National airports were then part of the FAA's appropriated budget. They were unable to modernize, and they were not directly responsive to what their customers wanted. Congress had the wisdom in 1986 to permit those two airports to become self-funding entities, outside the federal budget structure (though still owned by the federal government). Thanks to developing their own bondable revenue base, the airports embarked on dramatic modernization programs to better serve their customers. No one today would go back to the old model for these airports.

What Congress did for the Washington, D.C. airports in 1986 it can and should do for the Air Traffic Organization in 2005 or 2006.

Table of Contents

Tables

Figures

Part 1

Introduction: The Air Traffic Control Funding Crisis

Based on the recommendations of the National Civil Aviation Review Commission (known generally as the Mineta Commission), Congress authorized the reorganization of the air traffic control functions of the Federal Aviation Administration into a performance-based organization. The new Air Traffic Organization (ATO) was formally launched early in 2004, headed by former airline executive Russell Chew. But the high hopes for faster and more cost-effective modernization, and for productivity gains, are now at serious risk, with consequences for all of aviation.

Recent ATO presentations, based on flat-line five-year budget projections, show that without fundamental changes, there would be a cumulative $8.2 billion difference between costs and available funding from FY 2004 through FY 2009[1]. The vitally important capital budget (known as Facilities & Equipment) would be seriously affected, receiving $3.2 billion less investment over that time period. This means that at the very time that commercial air travel is recovering to pre-9/11 trend lines, and as the general aviation industry is poised for the introduction of large numbers of very light jets (VLJs) into controlled airspace, crucial modernization investments will be deferred or not made at all. And without major capacity-increasing modernization, the return of serious airspace congestion is inevitable. Rationing of scarce capacity (as has already been introduced at Chicago O'Hare) hangs over aviation as a predictable consequence.

This shortfall arises due to three basic causes. The first is a dramatic reduction in proceeds from the 7.5 percent tax on the value of airline tickets. Thanks to the low-fare revolution, average prices paid for tickets have declined dramatically over the past five years, and this revolution shows every sign of being a permanent, structural change. Second, the FAA's costs have increased markedly during the same time period. Third, since FAA funding is part of the federal budget process, it is constrained by government-wide concerns over the large federal budget deficit.

This report suggests that the looming ATC funding crisis offers an opportunity to rethink and restructure the way America pays for air traffic control. It turns out that we are the only country (apart from a few tiny island states and very poor countries) still using excise taxes to fund this vital public infrastructure. The entire modern world (except us) charges aviation users for ATC services, following standards promulgated by the International Civil Aviation Organization.

A funding stream based on such payments would have two major advantages over the present tax structure: (1) it would grow in step with aviation activity, rather than being constrained by federal budget problems,

and (2) it could provide the basis for issuing revenue bonds for modernization, ensuring that vitally needed capacity improvements get made in a timely fashion.

We are well aware of the history of "user fees" as fighting words in U.S. aviation circles, both within the airline industry and between airlines and general aviation. Nevertheless, we believe that a simple direct charging system can be tailored to the circumstances of U.S. aviation in ways that will be fair and acceptable to all parties, including general aviation. Moreover, we judge the impending funding crisis to be so severe as to require thinking outside the box in this manner.

Overall, four factors come together to make now the right time for considering this basic shift in paying for the ATC system:

- The funding crunch will be even worse than FAA projects, and since increasing taxes on airlines is not an option, nor (given the federal budget deficit) is increasing the general fund contribution, the only serious alternative is creating a bondable revenue stream.
- The new ATO was intended by the Mineta Commission to be funded by direct charges paid by users; this was rightly seen as a key factor in creating the incentives of a customer-provider relationship that would lead to creation of a businesslike corporate culture. Congress needs to finish the job of implementing what the Commission recommended.
- With more than half the controller workforce expected to retire over the next decade, there is a unique window of opportunity to use advanced technology to bring about major gains in ATC productivity, but this must be done very soon to take full advantage of the retirement bulge—hence the need for accelerated investment.
- The current aviation taxes sunset in FY 2007, so Congress must address the issue during the next 18 months in any case.

In the sections which follow, we first explain why airline ticket tax revenue will be even less than the FAA now projects over the coming two decades, making the funding crisis even worse than expected. Next we review how the rest of the world funds ATC, via direct ATC charges. Then we summarize the arguments in favor of ATC charges, as made by many previous expert bodies, most recently by the Mineta Commission. Finally we address the very real concerns that have dogged previous attempts to introduce ATC charges, showing how changed circumstances and a far simpler proposal can address those concerns.

Part 2

Repercussions of the Low-Fare Airline Revolution

For over two decades the dominant business model used by the largest carriers (now generally referred to as "legacy carriers"[2]) relied on a fare structure that separated the business traveler from the leisure traveler. This was done via loyalty programs and various restrictions on fare types, designed to keep business travelers paying high fares while being competitive for leisure or price-sensitive passengers. Another central feature of the legacy model is hub-and-spoke route systems to provide network scope and allow service in literally thousands of markets via connections at each carrier's chosen hub(s). This network route structure makes possible online service to spoke cities of all sizes and allows international online and code-share service as well. It now appears that maximizing scope in this way carried with it an efficiency penalty in the use of labor and capital. That has contributed to a high-cost structure, resulting in large ongoing losses for the legacy carriers.

A. The Low-Fare Revolution in Airline Pricing

A competitive challenge from a different business model—the low-cost model—has emerged. This model originated with the successful growth of Southwest Airlines after domestic economic deregulation in 1978 and has now grown to seven established low cost carriers[3] (LCCs) with 28 percent of the domestic traffic for the contiguous 48 states. LCCs now operate competitively in domestic city-pair markets that account for over 72 percent of passengers. And another sizeable low-cost carrier started operations in 2004. Competition from the growing and generally profitable LCC sector has apparently rendered uncompetitive the high-cost but previously profitable legacy model. Together with a recession beginning in early 2001, the September 11, 2001 terrorist attacks and the SARS outbreak have led to unprecedented losses among the legacy carriers of $25 billion over the 2001-2003 period. The legacies and seven low-cost airlines have lost another $9.2 billion in 2004 (see Table 1).

Perhaps the biggest single factor that has led to the LCCs' recent growth and success, and the struggles of the legacy carriers, has been the change in the willingness of business travelers and their companies to pay high fares for service. Traffic for the LCC group grew 37 percent between 2000 and 2003, while (domestic) legacy carrier traffic declined by 10.5 percent during the same period. The growth of the LCC alternative and the ability of air travelers to use the Internet to find the lowest fare in a market have led to the collapse of the revenue stream that had provided the legacy carriers' margins of profitability. The legacies have had to match low fares to maintain market share as best they could. Without the traditional substantial revenue

stream from high-paying business passengers, the high-cost structure of the legacy carriers is no longer sustainable. Most of the legacy carriers have attempted to dramatically cut costs by grounding aircraft, deferring orders for new aircraft, replacing larger jets with regional jet operations, reducing employment, and taking other steps to reduce costs, especially labor costs.

Table 1: Airline Operating Results, 2004 (in millions)

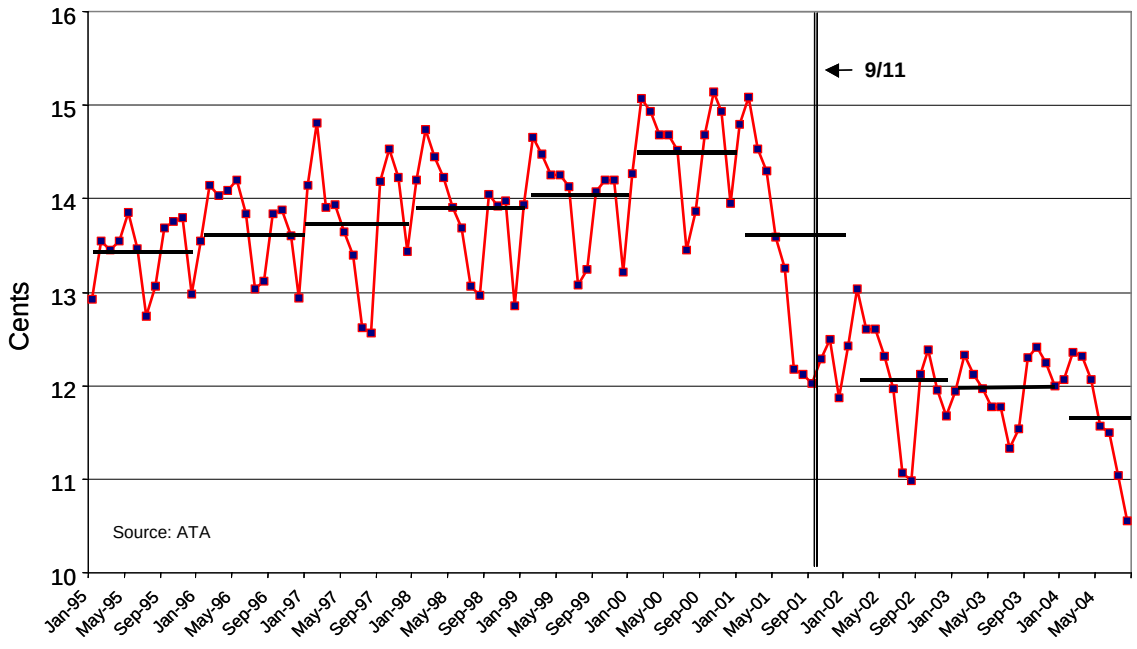
Airline	Revenue	Expenses	Operating Earnings	Margins %	Net Income	Margins
AirTran	1,041	1,009	33	3.2%	12	1.2%
Alaska	2,724	2,804	-80	-2.9	-15	-0.6
Amer West	2,338	2,352	-14	-0.6	-90	-3.8
American	18,645	18,789	-144	-0.8	-761	-4.1
Continental	9,744	9,973	-229	-2.4	-363	-3.7
Delta	15,002	18,310	-1,433	-9.6	-5,198	-34.6
Frontier*	787	818	-31	-3.9	-25	-3.2
JetBlue	1,266	1,153	113	8.9	47	3.7
Northwest	11,279	11,784	-505	-4.5	-848	-7.5
Southwest	6,530	5,976	554	8.5	313	4.8
United	16,391	17,168	-777	-4.7	-1,644	-10.0
US Air	7,177	7,495	-378	-5.3	-611	-8.5
Industry	**$92,924**	**$97,630**	**-$2,890**	**-3.1%**	**-9,183**	**-9.9%**

*Frontier results are for the 12 months in 2004
Source: Company reports and AirlineForecasts, LLC

Figure 1 traces monthly domestic yield (fare revenue per mile) from January 1995 to August 2004 for the legacy carriers plus America West and Alaska Airlines, which the Air Transport Association (ATA) collects.

These data show that the drop in yield began in April 2001, well before 9/11, and has persisted over three years into 2004 in spite of traffic levels approaching those of 2000. It appears that a new lower fare structure has become a permanent part of the domestic aviation landscape—a structural change. The legacy carriers are hard at work cutting costs and restructuring their operations so as to survive in the new low-fare environment. The continuing expansion, growth plans, and aircraft orders of the LCC segment suggest that, if anything, even more LCC competition and lower fares are likely to persist for years to come. These fundamental changes have clear implications for the amount of revenue likely to be collected for the Aviation Trust Fund.

Figure 1: Monthly U.S. Domestic Airline Yield (01/05 – 08/04)



Source: Air Transport Association (ATA)

B. FAA Forecasting Challenges

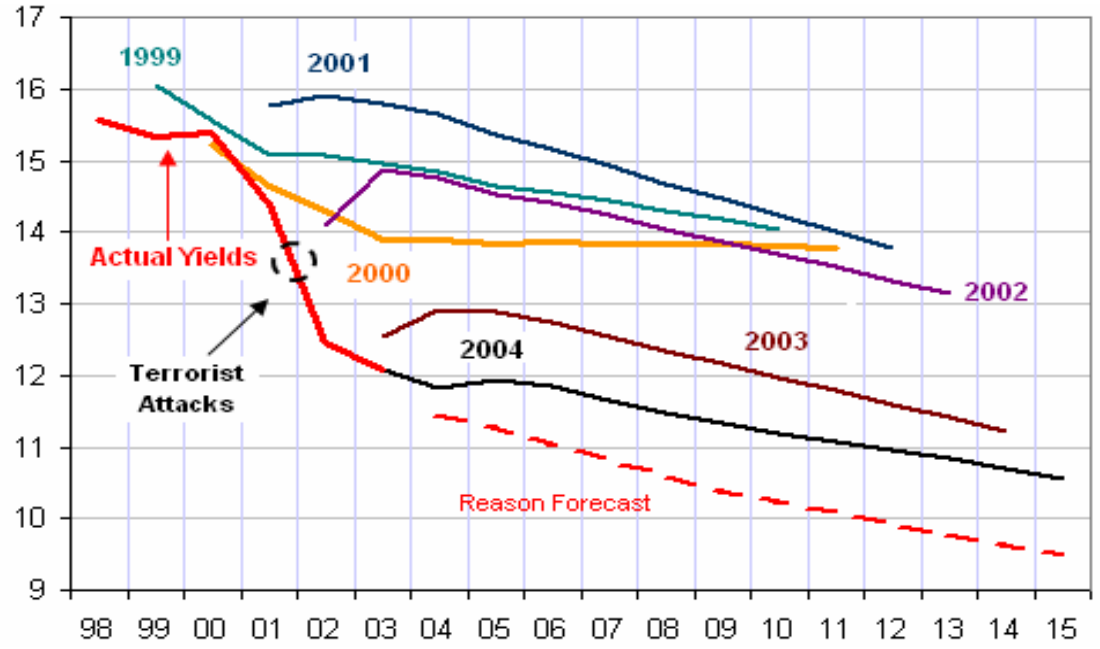
Forecasting airline activity has become very difficult in this time of dramatic structural change. The FAA, which has produced aviation forecasts for many years, uses systems of statistical and deterministic equations that rely on some tried and true relationships, such as the fairly close relationship of GDP growth to airline demand. For example, historically, system passenger revenue has remained in a narrow band of 0.9 to 1.0 percent of GDP. That relationship collapsed to below 0.7 percent of GDP after 9/11, but as noted above, that disconnect was actually caused by the end of the dot-com and stock market bubble economy, the rise of LCCs, and Internet distribution of airfares and reservations services. These changes produced a fundamental, structural change in the industry that has rendered historical forecasting methods unreliable.

The FAA forecasting methods have had a track record of overestimating yields, as shown in Figure 2. As can be seen, in its most recent forecasts the FAA has tried to account for the dramatic changes in the industry, which we have characterized as the low-fare revolution. It has produced separate forecasts for the "major network" carriers and the "low-cost, low-fare" carriers, and combined the results in an aggregate domestic forecast.

Despite these revisions, we believe this top-down forecasting method simply cannot do the job in the current state of play of the industry. It produces long-term growth rates that incorporate too much pre-9/11 statistical history, and it includes the 1990s stock market bubble. These simply do not account for the problems that confront the legacy carriers. The LCCs are forecast to grow at 9.8 percent short term and 8.9 percent in the 2005-2014 period.

Figure 2: FAA Yield Forecasts Have Been Too Rosy

Constant $2004 Domestic Revenue per Passenger Mile



Source: FAA Aerospace Forecasts and AirlineForecasts, LLC

We believe this top-down-style FAA forecast does not account for the structural shift down in yields (average fares). In Part 3, we develop alternate forecasts. What is needed is a bottom-up approach that considers the long-run potential growth rate of the airlines. The potential or sustainable growth rate is a function of operating and financing decisions.

C. Facing the Challenge of Airline Finances

The sustainable or potential growth rate of any firm depends on retained earnings and return on equity (ROE), meaning the return on capital that has been invested in the firm. If a company can produce a 10 percent ROE, it can borrow against that ability to earn and grow the firm (i.e., total assets) by 10 percent. Growth would be difficult if there was too much debt, so it is assumed that the firm attempts to manage the balance sheet in a way that produces the highest ROE and lowest cost of capital.

The optimal capital structure blends equity and debt and their associated risks. The lower the cost of capital, the higher the market value of the firm's equity and debt will be—what is called the "enterprise value" of the firm. The proper objective of management is to maximize firm value over the long run. Firm value is highest when there is an adequate level of equity on the balance sheet. The after-tax cost of debt is less than that of equity capital, but when there is too much debt the risk of bankruptcy increases, and this in turn increases the cost of capital and drives down the value of the firm.

The legacy airlines currently have far too much debt, reflected in large negative equity for the industry as a whole and significantly under-funded pension plans. The legacy airlines have older and more expensive workers than the LCCs, and they have large populations of retirees and their dependents. Legacy costs

include the off-balance sheet costs of pension deficits and the net expense of maintaining the pension plans. As the legacy airlines are forced to cede market share to the faster-growing and lower-cost competition, their relative unit labor costs increase because the airlines are left with the older and most senior employees. Faster-growing airlines have a greater proportion of younger new hires, and this lowers their average labor costs. Additionally, new aircraft under warranty have lower maintenance costs.

All airlines are pursuing activities to increase their productivity and operational efficiency. However, absolute improvement translates into little or no relative improvement if everyone joins in on the latest management fad or copies the same productivity-increasing activity. In the end it will come down to labor cost differentials between the two airline types, specifically the productivity of the workforce and the costs of the defined benefit pension and post-retirement health care plans.

Legacy airlines have more types of planes in their fleets, and this adds complexity and additional training, more inventory, and greater head count. National unions measure their performance by head count times wages and benefits. This type of value proposition has been a major driver behind the legacies' unproductive workforce and higher relative costs.

Differences in non-labor capital costs and route structures are important, but difficult to adjust without radical reorganizations. Capital costs (e.g., interest expense and operating leases) are higher at the legacy airlines because of inadequate earnings in past periods. In large measure, this is due to anachronistic labor agreements that negatively impacted productivity and differences in the way the airlines operated their businesses. Moreover, point-to-point airlines tend to focus on less congested airports and realize greater aircraft utilization.

Retained earnings build up equity on the balance sheet, and more equity means less debt and thus less interest expense. It also means less off-balance-sheet operating leases, which show up as "rents" on the income statement. Interest expense is tax-deductible, and the tax shield creates value, but only when there are profits and at reasonable levels of debt. The more profitable airlines own a higher percentage of aircraft and this results in lower "below operating line" interest and rent expense. As an example, Southwest's interest expense is one-fifth that of high-cost and highly leveraged Delta Airlines and one-third that of the industry average. Southwest's growth rate has been and continues to be three times higher than the industry average.

We believe yields will continue their downward trend, and cost and fare differentials between the LCCs and legacies will continue to narrow. Conceptually we know that lower costs translate into lower fares, and lower fares increase traffic. But even with more traffic, revenue often doesn't climb as fast as costs do, thanks to a poor track record of industry decisions on capacity.

Because of the severe financial distress of the legacies and high fuel prices, it appears that there will be a period of disruption that will lead to a much lower cost structure for the legacies. A likely scenario would be a series of bankruptcies that significantly reduce costs and yields relative to the long-run averages. Without significant cost reduction, most legacies will be forced to cede domestic market share to the faster-growing and lower-cost airlines. So the critical question is whether or not labor is willing to provide the relief required to grow, or simply maintain, the current size of the high-cost airlines.

In either case, we predict that even as the economy continues to grow, airline traffic and revenue will not likely grow with it as disruptions occur in the industry to drive costs down as fast as it did during the (financial) bubble economy of the last full business cycle (1990-2000). Because of the severe financial distress in the industry and structural shifts down in yields, we believe that a disruption period could last several years before some degree of equilibrium is established. In our view, airline industry revenue is unlikely to return to the historic multiple (.9 percent to 1 percent) of GDP.

We posit three basic scenarios facing the legacy airlines. These are:

Viable with Growth – 3.0 to 5.0 percent net profit margins[4]. Under this scenario, a legacy airline can afford to buy new aircraft and grow. Several LCCs are forced to retreat and the legacies regain lost ground and rebuild the brand. Employee morale improves as the company takes the competitive offensive and grows. To achieve this level of profitability, the legacies will have to lower operating expenses an additional 10 to 12 percent—given a forecast of $51 oil price average for 2005. These are ballpark point estimates for illustrative purposes only. In the cyclical and demand-derived airline industry, higher earnings are required during the expansion phase of the business cycle to offset the losses during the contractions.

Muddle Through/Slow Liquidation – 0.0 to 2.0 percent net profit margins. This scenario does not cover capital costs[5] and eventually leads to bankruptcy or a second bankruptcy for some, and little or no growth. Employees continue to be demoralized because of constant reorganizations that result in a shrinking airline that eventually goes out of business. The airline is forced to cede domestic market share and is in bankruptcy by or before the end of the business cycle. Management is unable to bring costs down to proper levels and the airline is forced to sell assets to maintain liquidity. The network weakens over time as capacity is reduced. Eventually, the airline may be broken into several airlines or assets sold piecemeal to the highest bidder.

Fast Liquidation – Under this scenario, the legacy carrier's liquidation value exceeds going concern value, and management is unable to bring labor and capital costs below current levels. Labor and key secured creditors dig in their heels and the company is forced to sell assets in a Chapter 7 liquidation.

A likely scenario for most legacy carriers is the *Muddle Through/Slow Liquidation* scenario. It is a failed strategy that only buys time before the airline is forced to restructure or merged with a different airline. The *Viable with Growth* scenario requires a change agent or catalyst that forces costs down to required levels in terms of covering the cost of capital.[6] We believe that airline unions will be unwilling to accept what is required in terms of labor costs and this is why most, if not all, of the legacy airlines will eventually be forced to file bankruptcy. Ironically, airlines that have historically paid leading-industry wages and benefits are now forced to pay below-industry wages and benefits. The reasons for this are two-fold: 1) to offset the costs of expensive pension plans and costs to support large pools of retirees, and 2) to cover the higher interest expense of debt, which is a function of inadequate earnings in the past.

It will take a real liquidation threat to achieve the *Viable with Growth* scenario for most of the legacy airlines. This means that a liquidation valuation must be made, or alternatively, it means that the various segments of the business (i.e., international and domestic) must be valued as stand- alone airlines that have much lower, cost-competitive structures. It will take these less attractive alternate plans to convince the unions that it is in their best interest to work with management in attaining a viable and growing company.

The window of opportunity to fix the legacy carriers will not be open long given the debt levels and large pension plan deficits. Management has the leverage in a bankruptcy, or with a liquidation threat, to bring labor and capital costs down to the required level. The sooner employees fully understand the required cost structure and required profit margins, the sooner the airlines can get on with competing in the marketplace and repairing the dangerously over-leveraged balance sheets. For many of the mature legacy airlines, their survival may depend upon a distressed termination of the defined benefit plans. This is a likely scenario in our view.

Yield and Growth Analysis: The Technical Perspective

The sustainable or potential growth rate of any firm is a function of earnings retention and return on equity (ROE). ROE can be broken down into three primary levers that management has some control over: profitability, asset turnover, and leverage. Profitability and asset turnover are a function of operating decisions, and leverage is based on financial policies.

The optimal capital structure is defined as the blend of equity and debt that produces the lowest weighted average cost of capital (WACC). The lower the WACC, which is a function of the risk profile of the firm (i.e., leverage), the higher the enterprise value[7] of the firm. The proper objective of management is to maximize firm value over the long run. The legacy airlines currently have far too much debt, reflected by the large negative (tangible[8]) equity on the balance sheet (Table 2) and the significantly under-funded pension plans. Defined Benefit pension plans for the big six legacy airlines may be under-funded by as much as $30 billion when conservative accounting assumptions are used.

Table 2: Airline Balance Sheet Strength, 2004 (in millions)

	Airline	Revenue	Net Equity **	% of Revenue
1	Southwest	6,530	5,504	84%
2	JetBlue	1,266	756	60
3	Frontier*	787	241	31
4	AirTran	1,041	293	28
5	Alaska	2,724	665	24
6	Amer West	2,338	28	1
7	Continental	9,744	-296	-3
8	American	18,645	-1,545	-8
9	Northwest	11,279	-3,172	-28
10	Delta	15,002	-5,796	-39
11	US Air	7,177	-3,393	-47
12	United	16,391	-7,921	-48
	Industry	$92,924	-14,636	-16

*Frontier results are for the 12 months in 2004 **Dec 31,2004 net tangible equity position AirTran, US Airways and United are estimated.

Source: Company reports and AirlineForecasts, LLC

We believe yields will continue their downward trend, and cost and fare differentials between the LCCs and legacies will continue to narrow. Load factors increase with higher traffic, but lower yields conspire to keep revenue per available seat miles (RASM) trending lower than costs per available seat mile (CASM) over the long run. This phenomenon is due to consistently very optimistic capacity decision-making at the industry level and explains in large measure why the industry has been unable to earn its capital costs over a full business cycle.

Historic GDP and traffic/revenue correlations have broken down and will most likely break down again under a disruption scenario. The disruption period could last several years before some degree of equilibrium is established around a new GDP/growth correlation.

Part 3

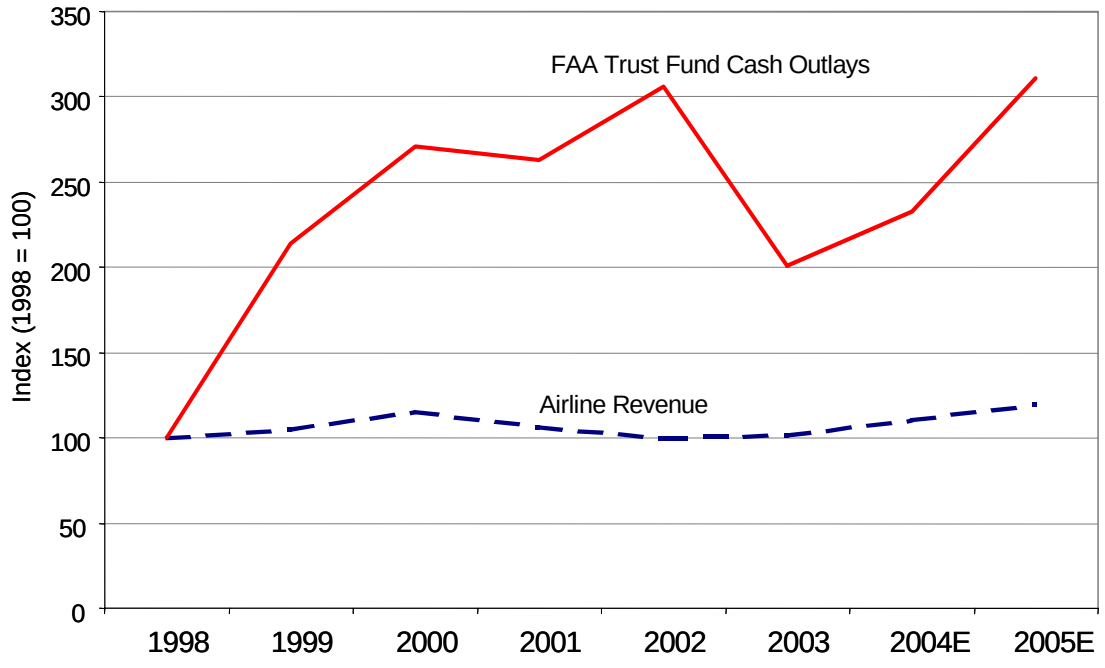
The Shrinking Aviation Trust Fund

The Aviation Trust Fund was established in 1970 in order to earmark the revenues from aviation excise taxes for the ATC system and airport capital spending. Before the Trust Fund was created, the proceeds from these taxes went into the federal government's general fund.

A. Forecasting Airline Yields

The current Aviation Trust Fund relies heavily on airline ticket tax and segment tax revenues for the majority of its funding. Trust Fund outlays have been growing much faster than airline revenues in recent years, as depicted in Figure 3. But with declining airline yields, the revenue flow into the Trust Fund will be reduced, and hence FAA spending will be constrained to something close to the annual in-flow.

Figure 3: Trust Fund Outlays vs. Airline Revenues

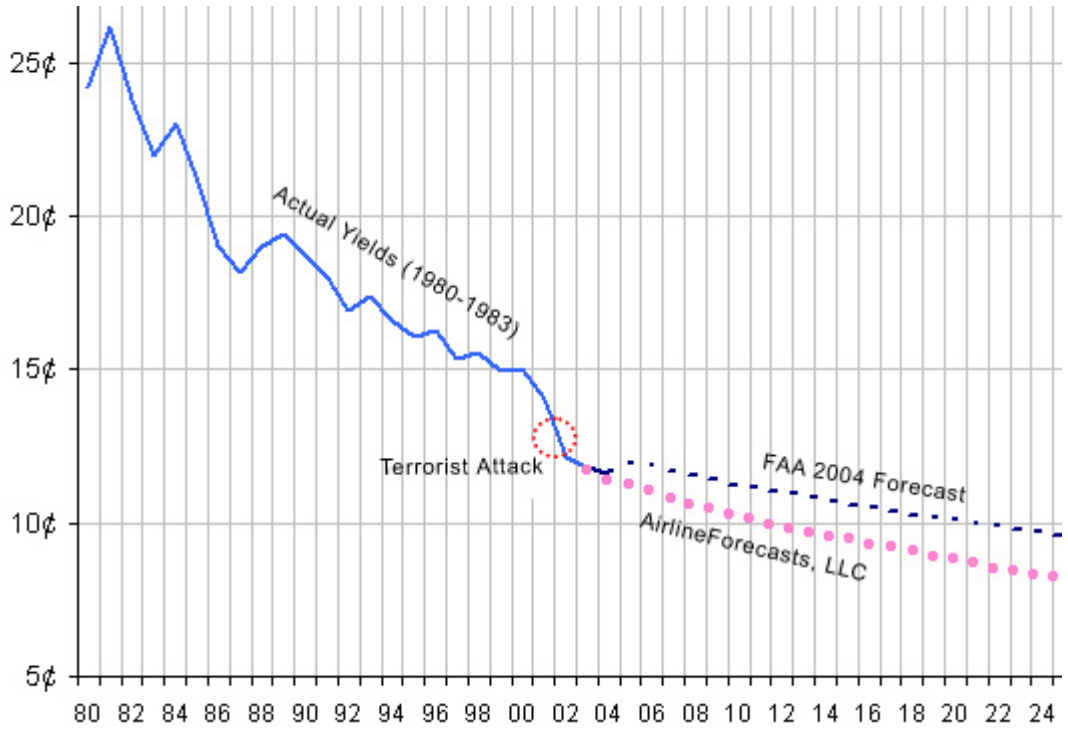


Source: AirlineForecasts, LLC and ATA's Trust Fund Spreadsheet

Over time, the current 7.5 percent ticket tax (which generates over half of the Trust Fund's revenue) source will be reduced as the industry restructures more completely to the new low-fare environment. We tested three revenue forecasts that take this new environment into account for the 2005-2025 period and compared them to the FAA revenue forecast extrapolated to 2025. The first assumes a 2.5 percent decline in constant dollar yield in 2004 and 2005, a 2 percent decline 2006 to 2010, and a 1 percent decline thereafter; we consider this the *best* case. The second is our *base* case, which assumes an average annual real yield decline of 2.0 percent. The third or *worst* case projection assumes a 3 percent annual yield decline. By contrast, the FAA yield forecast includes a yield decline in 2004, but an increase in 2005, and then a roughly 0.9 percent constant dollar yield decline into the future. Our yield estimates support our negative assessment of the airline industry and its need to lower costs.

The results are shown in Figure 4, which compares our base-case "Airline Forecast Scenario" with the FAA's most recent 2004 forecast.

Figure 4: Airline Industry Yields and Forecasts ($2003)



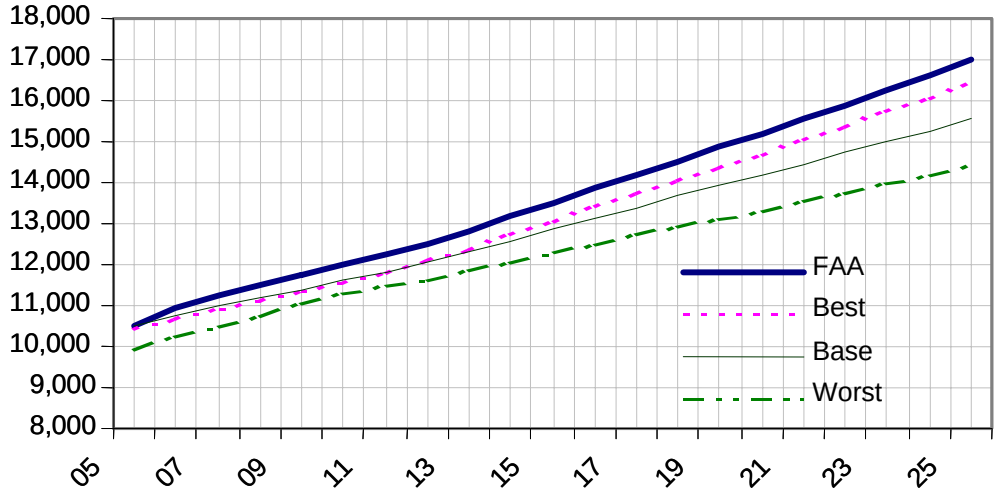
Source: FAA's 2004 Forecasts and Airlineforecasts, LLC.

The base case yield forecast should produce some stimulation in traffic relative to the FAA trend, because lower fares stimulate more travel. Hence, we had to consider adjusting projected traffic to reflect the impact of lower price on demand in order to estimate revenue. But our analysis concluded that there is very little price elasticity left in the airline industry overall, because so many markets are already disciplined by low fares (and by airline substitutes such as teleconferencing and corporate jets). However, this is not the case at the individual airline level. As an example, when JetBlue or Southwest initially enters a high-fare market, elasticity is strong and there is significant traffic stimulation.

B. Impact on Aviation Trust Fund Revenues

We have translated the four alternate forecasts of airline yield into forecasts of ticket tax revenues (defined here as the 7.5 percent tax on the value of each ticket plus the segment tax). Our analysis up to this point has left out several smaller Trust Fund revenue sources, namely: the waybill tax, the fuel tax, the international departure/arrival tax, the rural airports tax, and the tax on frequent flyer miles sold to third parties. This group of taxes has produced about $2.8 to $3.0 billion per year over the past five years. We have added $2.9 billion per year (in constant 2003 dollars) to the forecast years to bring our forecasts up to the full complement of tax sources. The results are depicted graphically in Figure 5.

Figure 5: Projected Aviation Trust Fund Revenue



Source: FAA's 2004 Forecasts and AirlineForecasts, LLC.

Over a period of 20 years, the differences between our forecasts and FAA's are fairly sizeable. Using then-year dollars (i.e., not discounting to present value), the *additional* 20-year shortfall in revenue ranges from $7.8 billion (best-case) to $24.7 billion (worst case). To put these differences on a comparable basis, we computed the net present value (NPV) of each, using a 5.5 percent discount rate. Our base-case forecast produced $7.1 billion less NPV than FAA's current 2004 forecast. Should our best-case model turn out to prevail, the difference would be $4.8 billion (NPV), but if our worst-case forecast most accurately reflects reality, the difference would be $15.3 billion (NPV).

Some recent events, such as the second bankruptcy of US Airways, the decision of Delta Airlines to drop its Dallas hub, and American and United reducing domestic aircraft, should have the effect of reducing excess capacity in the industry. This in turn should allow yields to improve to some degree. But we believe that such changes will at best provide short-term relief. The overriding fundamentals of LCC growth and the need for the legacy carriers to reduce their costs to competitive levels in order to survive will drive the decline in yields we are forecasting. We have yet to see any major moves by the legacy carriers that will alter these fundamentals.

C. Impact on FAA Budgets

To estimate the impact of reduced Trust Fund revenue on the FAA budget, we built a simple model of that budget, using four categories of revenue:

- Ticket and segment tax revenues
- Other aviation tax revenues (waybill, fuel, international arrival/departure, etc.)
- General Fund contribution
- Trust Fund drawdowns (which have become increasingly used to close the gap in FAA budgets).

These four sources must cover the four basic categories of FAA expenditure:

- Operations
- Grants-in-aid for airports (AIP)
- Research, engineering & development (RE&D)
- Facilities and equipment (F&E).

In Table 3, we use an extrapolation of the FAA's latest projection of ticket tax and segment fee revenue, and we project the "other tax revenues" as the estimated FY2004 number adjusted annually by the Consumer Price Index (CPI). The $3 billion general fund contribution in FY2004 is high by historical standards. We assume that in the deficit-reduction environment of the next decade, Congress is more likely to revert to the historical average of $2.2 billion per year (and not adjust it for inflation). We assume that Congress will draw down the remaining uncommitted $3 billion Trust Fund balance by about $500 million per year, leaving a reserve amount of just $1.5 billion.

On the expenditure side, we have used historical data on the Operations budget from 1985 through 2004 to fit a curve to this largest (and fastest-growing) budget category. For the airport grants program, given the congressional priority on a large AIP effort but the countervailing pressures for deficit reduction, we assume that the program will remain at its current $3.4 billion size, adjusted for inflation, for the entire forecast period. We also keep RE&D at its current size, adjusted for inflation.

What is left over, then, is the money available for capital investment (F&E). As can be seen, if the FAA ticket tax forecast is correct, F&E can remain at $2 billion in 2005 and 2006, but will then begin shrinking steadily to a level of about $1 billion per year. However, if our more pessimistic projections of ticket tax revenue turn out to be more accurate, F&E would begin shrinking in 2005, reaching essentially zero between 2015 and 2020. Thus, it is clear that under plausible assumptions, FAA's much-needed modernization (the capital expenditures encompassed by the Facilities & Equipment budget) is seriously at risk.

Table 3: FAA Assumed vs RF Estimated Revenue Projections and Impact on Facilities and Equipment Account																						
	2004E	**2005E**	**2006E**	**2007E**	**2008E**	**2009E**	**2010E**	**2011E**	**2012E**	**2013E**	**2014E**	**2015E**	**2016E**	**2017E**	**2018E**	**2019E**	**2020E**	**2021E**	**2022E**	**2023E**	**2024E**	**2025E**
FAA assumed segment and ticket tax revenue	6,876	7,583	8,066	8,328	8,575	8,833	9,092	9,355	9,631	9,931	10,259	10,601	10,966	11,296	11,620	11,950	12,288	12,633	12,986	13,348	13,718	14,094
Other taxes revenue (1)	2,875	2,947	3,021	3,096	3,173	3,253	3,334	3,417	3,503	3,590	3,680	3,772	3,867	3,963	4,062	4,164	4,268	4,375	4,484	4,596	4,711	4,829
- **Total tax revenue**	**9,751**	**10,530**	**11,086**	**11,425**	**11,748**	**12,085**	**12,426**	**12,772**	**13,134**	**13,522**	**13,940**	**14,373**	**14,833**	**15,259**	**15,683**	**16,114**	**16,556**	**17,007**	**17,470**	**17,944**	**18,429**	**18,923**
General Funds	3,010	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200
Net Trust Fund draw	1,112	500	500	500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- **Total available funds**	**13,873**	**13,230**	**13,786**	**14,125**	**13,948**	**14,285**	**14,626**	**14,972**	**15,334**	**15,722**	**16,140**	**16,573**	**17,033**	**17,459**	**17,883**	**18,314**	**18,756**	**19,207**	**19,670**	**20,144**	**20,629**	**21,123**
Operations (2)	7,479	7,618	7,944	8,270	8,596	8,922	9,248	9,574	9,900	10,226	10,552	10,879	11,205	11,531	11,857	12,183	12,509	12,835	13,161	13,487	13,813	14,139
Grants-In-Aid for Airports (BA/OBL. LIM.)	3,380	3,465	3,551	3,640	3,731	3,824	3,920	4,018	4,118	4,221	4,327	4,435	4,546	4,659	4,776	4,895	5,018	5,143	5,272	5,403	5,539	5,677
Research, Engineering and Development	119	122	125	128	131	134	138	141	145	148	152	156	160	164	168	172	176	181	185	190	195	199
- **Subtotal expenses**	**10,978**	**11,204**	**11,620**	**12,038**	**12,458**	**12,881**	**13,306**	**13,733**	**14,163**	**14,596**	**15,031**	**15,469**	**15,910**	**16,354**	**16,800**	**17,250**	**17,703**	**18,159**	**18,618**	**19,080**	**19,546**	**20,015**
Facilities and Equipment	2,895	2,026	2,166	2,087	1,490	1,405	1,320	1,239	1,171	1,126	1,108	1,104	1,123	1,105	1,082	1,064	1,053	1,049	1,052	1,064	1,083	1,108
RF Estimated Shortfall in Assumed FAA Revenue																						
- RF Best Case		77	279	306	331	359	392	445	500	554	608	665	747	816	884	955	1,030	1,109	1,191	1,277	1,366	1,458
- RF Worst Case		564	738	724	706	689	674	776	881	987	1,096	1,211	1,348	1,471	1,594	1,722	1,854	1,990	2,131	2,276	2,425	2,577
Adjusted Facilities and Equipment																						
- FAA Best Case (3)		2,026	2,166	2,087	1,490	1,405	1,320	1,239	1,171	1,126	1,108	1,104	1,123	1,105	1,082	1,064	1,053	1,049	1,052	1,064	1,083	1,108
- RF Best Case (4)		1,949	1,887	1,780	1,159	1,046	929	794	670	572	500	440	376	289	199	109	23	-60	-139	-213	-283	-351
- RF Worst Case (5)		1,461	1,428	1,363	784	715	646	463	290	139	12	-106	-225	-366	-512	-658	-801	-942	-1,079	-1,213	-1,342	-1,470

Notes:

(1) Waybill, fuel, interl arr/dep tax, rural airports, freq flyer taxes (2) trend lline estimate 2005-25 - double exponential smoothing

(3) FAA estimates are based on 2004 FAA forecasts (4) RF Base Case estimates are based on a 2% yield decline (5) RF Worst Case estimates are based on a 3% yield decline

Key Assumptions:

(1) 2.5% inflation rate (2) Other taxes held constant (3) Grants-in-Aid held constant (4) RE&D held constant

Part 4

ATC Funding Overseas

Few Americans realize it, but the way the United States funds air traffic control is unique among the world's nations. Virtually everywhere but in this country, ATC is viewed as a set of services provided to aircraft, for which it make sense to charge fees to the operator of the aircraft. The only other country that funded ATC by means of a tax on airline tickets was Canada. But that practice ended when Nav Canada was created to take over the ATC function from the Canadian government. During a two-year transition period, the Canadian ticket tax was phased out and ATC user fees were phased in. Thus, *the United States is the sole remaining developed country not charging users directly for air traffic control services*.

The International Civil Aviation Organization (ICAO) sets the general principles for ATC charging. The United States is an ICAO signatory, which generally means carrying out aviation activities in accordance with its principles. For example, ICAO in November 2001 adopted a requirement that all signatory states separate ATC operations from safety oversight by November 2003. That was one of the principal reasons for the FAA's recent decision to create a new Air Traffic Safety Oversight Service (AOV), which came into operation early in 2004. AOV will oversee the FAA's new Air Traffic Organization at arms-length, just as FAA's Flight Standards (AFS) oversees the airlines.

ICAO's standards for ATC fees call for charges for three flight regimes: terminal-area (landings and take-offs), en-route, and overflight. ICAO's manual on the subjects states that "only distance flown and aircraft weight are recommended . . . as parameters suitable for use in a charging system."[9]

Table 4 lists the types of charges levied for ATC services in the three flight regimes specified by ICAO. Only 21 out of 180 countries do not charge at all for ATC services: Bahamas, Barbados, Benin, Brunei, Comoros, Gambia, Guinea-Bissau, Guyana, Kiribati, Kuwait, Lesotho, Monaco, Namibia, Samoa, SaoTome & Principe, Somalia, Swaziland, Togo, Tonga, Tuvalu, and the United States. Besides the United States, the others all tend to be small and/or poor countries with only a single airport receiving commercial air service (and that airport generally does charge landing fees). But there is no separate charge for the terminal, en-route, or overflight functions of ATC in these countries.

By contrast, the general rule in developed countries is to charge fees for all three flight regimes, generally based on the ICAO charging principles (using weight and distance for overflight and en-route charging and weight for terminal-area charging). A few countries charge a flat amount per flight, as indicated in the table.

Although most countries base their ATC charges on weight and distance, few economists support using those parameters. They point out that the costs of providing ATC services do not bear any relationship to aircraft weight, but do vary with distance or time flown. They also note that costs may be much higher in

complex airspace near major hub airports and at certain busy times of day. The global aviation community is beginning to look anew at how best to charge for ATC services. In June 2003, major European aviation organizations met in Brussels to discuss increasing the economic efficiency of air traffic management. They agreed on an action plan that is looking into, among other things, "determining the most effective way of funding and charging for air navigation services."[10] And in early 2005, Nav Canada formally asked for airline industry comments on its weight-distance charging system, responding to concerns that weight should not be a key parameter and also to suggestions that charges might be higher during peak hours.[11]

Although the United States historically has not charged any form of ATC fee, in 1996 Congress authorized it to begin charging fees for overflights (flights that pass over, but do not land within, the United States). The law specified that the fees should be "directly related" to the cost of the ATC services provided. On several occasions the FAA has put forward a formula and begun to collect the fees, but in each case a group of international airlines challenged the fee rule in federal courts, on grounds that it was value-based rather than cost-based. In each case, those airlines have prevailed. Most recently, Congress changed the law to authorize overflight fees that are "reasonable" as determined by the FAA Administrator. The agency was also directed to consult with the international aviation community before issuing a new fee rule based on the new standard. As of this writing, no new fee schedule has been put forward by the FAA, and hence it is not charging overflight fees.

Table 4: Types of ATC Fees Charged in 180 Countries

Country	Overflight	En-Route	Terminal
Afghanistan	flat		flat
Algeria	flat		
Angola	weight-distance	weight-distance	
Antigua & Barbuda			weight
Argentina	weight-distance	weight-distance	weight
Armenia	weight-distance	weight-distance	flat
Australia	weight-distance	weight-distance	weight
Austria	weight-distance	weight-distance	weight
Azerbaijan	weight-distance	weight-distance	weight
Bahamas			
Bahrain			weight
Bangladesh	weight	weight	
Barbados			
Belarus	weight-distance	weight-distance	weight
Belgium	weight-distance	weight-distance	
Belize	weight-distance	weight-distance	
Benin			
Bolivia	weight-distance	weight-distance	
Botswana	weight-distance	weight-distance	
Brazil	weight-distance	weight-distance	weight
Brunei			
Bulgaria	weight-distance	weight-distance	weight
Burkina Faso	weight-distance	weight-distance	

Table 4: Types of ATC Fees Charged in 180 Countries			
Country	**Overflight**	**En-Route**	**Terminal**
Burundi	weight		
Cambodia	weight		weight
Cameroon	weight-distance	weight-distance	
Canada	weight-distance	weight-distance*	weight
Cape Verde	weight-distance	weight-distance	
Central African Republic	weight-distance	weight-distance	
Chad	weight-distance	weight-distance	
Chile	weight-distance	weight-distance	weight
China	weight-distance	weight-distance	
Colombia	weight-distance		
Comoros			
Congo	weight-distance	weight-distance	
Cook Islands	weight-distance		
Costa Rica	weight-distance	weight-distance	weight
Cote d'Ivoire	weight-distance	weight-distance	
Croatia	weight-distance	weight-distance	
Cuba	weight-distance		weight
Cyprus	weight-distance	weight-distance	
Czech Republic	weight-distance	weight-distance	weight
Dem. People's Rep. of Korea	weight-distance	weight-distance	weight
Dem. Republic of Congo	weight-distance	weight-distance	
Denmark	weight-distance	weight-distance*	weight
Djibouti	weight	weight	
Dominica			weight
Dominican Republic	weight		weight
Ecuador	weight-distance	weight-distance	
Egypt	weight		weight
El Salvador	weight-distance	weight-distance	
Equatorial Guinea	weight-distance	weight-distance	
Eritrea	weight	weight	
Estonia	weight-distance	weight-distance	weight
Ethiopia	weight-distance	weight-distance	
Fiji	weight-distance	weight-distance	
Finland	weight-distance	weight-distance	weight
France	weight-distance	weight-distance	weight
Gabon	weight-distance	weight-distance	
Gambia			
Georgia	weight-distance	weight-distance	weight
Germany	weight-distance	weight-distance	weight

Table 4: Types of ATC Fees Charged in 180 Countries			
Country	**Overflight**	**En-Route**	**Terminal**
Ghana	distance	distance	
Greece	weight-distance	weight-distance	
Grenada			weight
Guatemala	weight-distance	weight-distance	
Guinea	weight-distance	weight-distance	weight
Guinea-Bissau			
Guyana			
Haiti	weight	weight	weight
Honduras	weight-distance	weight-distance	
Hungary	weight-distance	weight-distance	
Iceland	flat	flat	
India	weight	weight	weight
Indonesia	weight-distance	weight-distance	
Iran	weight-distance	weight-distance	
Iraq	weight	weight	
Ireland	weight-distance	weight-distance	weight
Israel	weight	weight	weight
Italy	weight-distance	weight-distance	weight
Jamaica	weight	weight	weight
Japan	flat	weight-distance	
Jordan	weight		
Kazakhstan	weight-distance	weight-distance	weight
Kenya	weight	weight	
Kiribati			
Kuwait			
Kyrgyzstan	weight-distance	weight-distance	weight
Laos	weight	weight	flat
Latvia	weight-distance	weight-distance	weight
Lebanon	weight		
Lesotho			
Liberia	weight-distance	weight-distance	
Libya	weight	weight	
Lithuania	weight-distance	weight-distance	weight
Luxembourg	weight-distance	weight-distance	
Madagascar	weight-distance	weight-distance	
Malawi	flat	weight	
Malaysia	weight-distance	weight-distance	
Maldives	weight	weight	weight
Mali	weight-distance	weight-distance	
Malta	weight-distance	weight-distance	

Table 4: Types of ATC Fees Charged in 180 Countries			
Country	**Overflight**	**En-Route**	**Terminal**
Mauritania	weight-distance	weight-distance	
Mauritius	weight-distance	weight-distance	
Mexico	weight-distance	weight-distance	
Moldova	weight-distance	weight-distance	weight
Monaco			
Mongolia	weight-distance	weight-distance	
Morocco	weight-distance	weight-distance	weight
Mozambique	weight	weight	
Myanmar	weight	weight	
Namibia			
Nepal	weight	weight	
Netherlands	weight-distance	weight-distance	weight
Neth. Antilles	weight-distance	weight-distance	weight
New Zealand	weight-distance	weight-distance	weight
Nicaragua	weight-distance	weight-distance	
Niger	weight-distance	weight-distance	
Nigeria	weight-distance	weight-distance	
Norway	weight-distance	weight-distance	
Oman	weight	weight	
Pakistan	weight		weight
Panama	weight-distance	weight-distance	
Papua New Guinea	weight-distance	weight-distance	weight
Paraguay	weight	weight	
Peru	weight	weight-distance	
Philippines	weight-distance	weight-distance	
Poland	weight-distance	weight-distance	weight
Portugal	weight-distance	weight-distance	weight
Qatar			
Republic of Korea	weight	weight	weight
Romania	weight-distance	weight-distance	weight
Russia	weight-distance	weight-distance	
Rwanda	weight	weight	
St. Kitts & Nevis			weight
St. Lucia			weight
St. Vincent & Grenadines			weight
Samoa			
Sao Tome & Principe			
Saudi Arabia	weight-distance	weight-distance	
Senegal	weight-distance	weight-distance	
Seychelles	weight-distance	weight-distance	

Table 4: Types of ATC Fees Charged in 180 Countries			
Country	**Overflight**	**En-Route**	**Terminal**
Sierra Leone	weight-distance	weight-distance	
Singapore	weight-distance	weight-distance	
Slovakia	weight-distance	weight-distance	weight
Slovenia	weight-distance	weight-distance	
Solomon Islands	weight-distance	weight-distance	
Somalia			
South Africa	weight-distance	weight-distance	weight
Spain	weight-distance	weight-distance	weight
Sri Lanka	weight	weight	
Sudan	flat		weight
Suriname	weight	weight	
Swaziland			
Sweden	weight-distance	weight-distance	weight
Switzerland	weight-distance	weight-distance	weight
Syria	weight		
Tajikistan	weight-distance	weight-distance	weight
Thailand	weight		weight
[Yugoslav] Macedonia	weight-distance	weight-distance	weight
Togo			
Tonga			
Trinidad & Tobago	distance	distance	
Tunisia	weight	weight-distance	
Turkey	weight-distance	weight-distance	flat
Turkmenistan	weight-distance	weight-distance	flat
Tuvalu			
Uganda	weight	weight	
Ukraine	weight-distance	weight-distance	weight
United Arab Emirates	weight	weight	
United Kingdom	weight-distance	weight-distance	
Tanzania	weight	weight	
United States	???	ticket tax	
Uruguay	weight	weight	
Uzbekistan	weight-distance	weight-distance	weight
Vanuatu			weight
Venezuela	weight-distance	weight-distance	
Viet Nam	weight-distance	weight-distance	
Yemen	weight	weight	
Zambia	weight-distance	weight-distance	
Zimbabwe	weight-distance	weight-distance	

*oceanic = flat *Tariffs for Airports and Air Navigation Services*, International Civil Aviation Organization, Doc 7100 (2002)

Part 5

Advantages of ATC Charges

A. Background: Two Decades of Support for ATC Charging

Support for shifting the funding of air traffic control from excise taxes to user charges is a consistent theme of serious reform proposals extending over the past two decades. It is integral to the reform recommendations of diverse expert groups, regardless of whether their reform approach was an independent FAA, a government ATC corporation, or a separate ATC organization within the FAA. Among the advocates of shifting to ATC charges have been the following:

- The **Air Transport Association**, as part of its proposal for a federal ATC corporation (1985);[12]
- The **Aviation Safety Commission**, as part of recommending an independent, self-financed Federal Aviation Authority (1988);[13]
- The **Transportation Research Board**, in its *Winds of Change* report (1991);[14]
- The **Congressional Budget Office**, as part of a major report on how best to pay for large-scale transportation infrastructure (1992);[15]
- The National Commission to Ensure a Strong Competitive Airline Industry (known as the **Baliles Commission**), in recommending a self-supporting ATC corporate entity within DOT (1993);[16]
- The **National Performance Review**, Vice President Gore's reinventing government office, (1993);[17]
- The Secretary of Transportation's **Executive Oversight Group**, in its proposal for a self-supporting government ATC corporation called USATS (1994);[18]
- The National Civil Aviation Review Commission (**Mineta Commission**), in recommending the creation of a performance-based organization for ATC within the FAA (1997).[19]

Each of these expert bodies reviewed the FAA's performance of the air traffic control mission, both tactical (day-to-day operations) and strategic (long-term modernization). After careful consideration, each independently concluded that a funding base of excise taxes, allocated via the federal budget process, was poorly matched to the needs of operating the high-tech service business of air traffic control. In what follows, we will summarize the principal findings of these bodies on this issue.

B. Why Shift ATC from Taxes to Charges?

The federal government has relied on aviation excise taxes throughout the post-World War II environment that saw the growth of today's aviation industry. The current Aviation Trust Fund was established in 1970 in an attempt to earmark the revenue from these taxes for ATC and airport capital spending, as well as a portion of FAA operating costs. Prior to passage of the 1970 legislation, the proceeds from aviation taxes went into the general fund and could be used for any purpose.

Thus, the earmarking of aviation tax revenues via the Trust Fund was a step toward greater accountability to aviation users for the taxes they are required to pay. Nevertheless, it has proved less than ideal as a way to fund ATC. First, it has not proved to be a reliable source of funding. In FY 1981, Congress failed to reauthorize the Trust Fund, so the taxes went into the general fund for 23 months. And in 1996, Congress failed to reauthorize the taxes, which led to draining the Trust Fund to enable the FAA to keep operating for eight months. That, in turn, was only possible because Congress and various Administrations had allowed surpluses to build up in the Trust Fund by not spending as much as was collected (thereby making the federal budget deficit look smaller). That problem was subsequently addressed by creating budgetary "firewalls" in the AIR-21 reauthorization act, but the fact remains that the budget of the FAA and its air traffic control unit (the Air Traffic Organization) remain captive to the federal budget process.

And that leads to the first rationale for shifting from excise taxes (which must be appropriated every year as part of the budget process) to ATC charges (which would be paid directly by customers to the ATO, just as customers pay for services provided by Amtrak and the U.S. Postal Service).

Reason #1: To provide for a self-sufficient ATC operation, at a funding level driven by the needs and level of aviation activity.

The Mineta Commission concluded that "the agency's spending of user charges should be controlled by its revenues, not by the budget caps," and that it "should have the flexibility to alter the user charges relative to aviation system demands." The Clinton administration DOT's USATS study concluded that an ATC provider could be self-sufficient from user charges at a level of activity and funding determined by its users. This rationale was also cited by the Baliles Commission on a stronger airline industry.

In other words, what these expert bodies all concluded is that, despite various reforms, the current funding process for air traffic control bears no direct relationship to the needs of aviation users. Rather, it continues to be driven by the constraints of the overall federal budget. As a current illustration, the FY 2005 FAA budget provided for a $400 million reduction in capital investment, precisely at a time when flight activity is growing again and modernization is even more essential to prevent the return of gridlock. This can only be resolved by taking the funding stream out of the federal budget process.

And this leads to a second rationale for shifting to direct user fees: financing modernization effectively:

Reason #2: To provide a reliable revenue stream against which long-term bonds for modernization can be issued.

A high-tech organization needing to pay for large-scale modernization is at a huge disadvantage if it must finance such investment a year at a time, on a pay-as-you-go basis—especially if it cannot predict from one

year to the next how much money it will have available for this purpose. The second item on the Baliles Commission's list of principles to guide the creation of a restructured ATC organization was "Ability of the corporate entity to issue long-term bonds for capital purchases." Being able to leverage a predictable revenue stream was considered the key requirement to "fund the high-technology capital improvement program needed for a state-of-the-art air traffic control system."

This point was also integral to the recommendations of Secretary of Transportation Pena's Executive Oversight Group (EOG), which listed as the number one financial benefit of restructuring: "Using long-term debt to finance major procurements in the modernization of the air traffic control system." The EOG did not simply assert this. It created a separate Corporate Assessment Task Force staffed by outside financial experts to develop financing scenarios. That task force found that it would be entirely feasible for an ATC corporation with a dedicated user-charge revenue stream to issue long-term revenue bonds for its capital modernization program.[20]

This was also a key point made by the Mineta Commission with regard to its recommendation for the creation of a performance-based organization (PBO), now known as the Air Traffic Organization (ATO) within the FAA. Its discussion of the issue is worth quoting at length, since the Commission's user-charge and financing recommendations have yet to be implemented by Congress:

> ***Bonding Authority.*** *The [ATO] should be given authority for long-term borrowing . . . . Borrowing is not an option but a necessity for a capital intensive enterprise, especially in technology transitions . . Borrowing allows leveraging of resources by enabling key long-term investments to be made while repayments are made over time. Such investments could help reduce costs to the [ATO] or benefit system users. Borrowing for such investments would allow the cost to be repaid as the benefits of the investments are received. The ability to borrow would give the [ATO] greater flexibility to take advantage of capital investment opportunities as technology changes. . . .*
>
> *Borrowing for needed ATC investments should be viewed in the broader context of the [ATO] managed by a professional board. Users and the [ATO] will have the same objective of providing a level of service quality at the lowest reasonable cost. Users would have greater input into capital decisions, capital budgets, and annual business plans. Borrowing for needed capital investment is a tool that can be used to expedite the introduction of new equipment.*

This discussion of user involvement leads to the third reason for shifting from taxes to charges for ATC services:

Reason #3: To improve the productivity of the ATC system, by better targeting investment to benefit users.

This benefit stems directly from the economics of a customer-focused business. The Congressional Budget Office stated the case in principle: "The prices that users are willing to pay for air traffic control services can also serve as signals indicating which additional investments will have the greatest payoffs. These signals can help the FAA set priorities in phasing in new equipment." In point of fact, over the years the FAA has expended considerable sums on new technology that its airline customers did not want and would not have paid for, had they been given the choice (e.g., the Microwave Landing System and the Wide Area Augmentation System).

As the Mineta Commission put it, the information provided by the combination of a serious accounting system and customer-paid prices would

> *…mimic the information and resources that the market system provides to the private portions of the aviation system, and will provide valuable tools to decision-makers in the aviation system. Revenue streams will serve as signals to providers within the system . . . as to where improvement is needed or demand is not being met. This approach also ensures that these revenue streams provide the financial resources needed to act on those signals. . . . The Commission believes that better spending decisions will come from better information. It is not hard to make a strong general case for the gains from imposing user charges that reflect the costs of providing air traffic control services. This is a basic tenet of the free-market economy.*

The report goes on to lay out the benefits of better information on revenues and costs:

> *First, the [ATO] and its customers would be able to plan more effectively. Better information allows better analysis and better decisions. The [ATO] would be able to see more clearly where more spending, faster development or deployment of new technologies, and new investment are required. Such analysis could point to greater emphasis on particular improvements or technologies applicable to many elements of the system or to solutions to problems at particular locations, as appropriate.*
>
> *Similarly, the [ATO] would have access to realistic information about its performance. Public availability of data on revenues and costs of system elements will encourage [ATO] managers to focus their efforts. Such data would also be helpful in the development of a system of performance measures which customers, the Congress, and the general public could use to judge how well [ATO] does its job.*

Reason #4: To provide incentives for customers to equip their aircraft with important new technologies.

Many of the improvements promised by new ATC technology depend for their effectiveness on all aircraft in a certain airspace region being equipped with the necessary onboard equipment. But adding a new black box to a plane always involves a cost, one which the owner may be reluctant to pay, especially if the benefits will increase only gradually over time as more users likewise equip. Examples include the GPS-based automatic-dependent-surveillance broadcast (ADS-B) and controller-to-pilot data link communications (CPDLC). The former was provided at no charge to general aviation aircraft owners in Alaska as part of the Capstone project, and made possible large improvements in safe operations there. CPDLC was in the early stages of a large-scale airline test at Miami Center when the FAA pulled the plug, partly out of concern that in the strained airline economic climate of 2003, not enough airlines would add the equipment to their planes to make expanding the program worthwhile.

As aviation economist Richard Golaszewski has pointed out in this context, those national ATC systems that are funded via user charges have available an incentive mechanism not readily available to the FAA to address this problem: “In a user fee system, user fee adjustments can be made to reallocate costs such that each party ends up as a net beneficiary.”[21] In other words, it makes good economic sense for the ATC provider to offer discounts on its user charges to aircraft operators who invest in productivity-enhancing (i.e., cost-reducing) equipment.

This is more than just theory. Nav Canada introduced its new-technology oceanic ATC system, GAATS, on the North Atlantic in February 2002. Because it costs the company less to control flights equipped to use GAATS, it sought to speed up its addition of the needed on-board equipment. Hence, Nav Canada cut in half the per-flight charge for that route for aircraft equipped with the needed ADS-B and CPDLC. As of the beginning of 2005, the company reported that 45 percent of all planes on the North Atlantic were suitably equipped. Eurocontrol is using this approach to speed the introduction of CPDLC in Europe. Since CPDLC will reduce controller workload, thereby reducing costs over time, it is offering customers a 2 percent reduction in user charges for CPDLC-equipped planes.[22]

Reason #5: To increase fairness in paying for air traffic control.

The current excise tax system results in numerous cases of comparable planes receiving identical ATC services but paying significantly different amounts for them. That's because, in the case of airlines, the largest single component of what they pay is a tax that is a fixed percentage of the price of each airline ticket. In congressional testimony, when ATC user fees were under discussion in Congress in 1997, one of the authors of this paper pointed out how, by contrast, a system of ATC fees would improve fairness compared with the status quo:[23]

- Under this proposal, two 737s flying from the same point A to the same point B, using the same ATC services, would pay the same amounts. *This is an increase in fairness.*
- Under this proposal, a flight that goes from A to B directly, without going into and out of a hub airport on the way, would pay less than a flight that gets from A to B via a hub. *This, too, is an increase in fairness.*
- Under this proposal, a Falcon 50 used as an air charter carrying passengers for hire from A to B would pay the same as a company-owned Falcon 50 flying company executives from A to B. *Another increase in fairness.*

As the Mineta Commission pointed out on this question, because the current excise taxes are not appropriately tied to the ATC services provided to a particular flight, they "do not fairly distribute costs among users."

Reason #6: To develop a customer-focused corporate culture.

Canadian ATC services were transformed into performance-based Nav Canada because aviation user groups were frustrated at not getting what they wanted and needed from the government agency and sought reform. The guiding principle of Canadian ATC reform was "user pay means user say." In other words, the thesis was that if the organization providing ATC services was paid directly by its users, a true customer-provider relationship would develop, in which the provider would be far more responsive to customer needs than was the case prior to the reform. Nav Canada was also set up with a board of directors representing key aviation stakeholders (including employees).

At the March 2004 Air Traffic Control Association technical conference in Atlantic City, Nav Canada CEO John Crichton cited the "user pay means user say" principle in a presentation on the company's progress. In describing the change in corporate culture that has been brought about since the ATC operation was restructured, he noted that the customer is the one who pays your bills; hence, under the previous system, the Minister of Transport was the "customer." But today, he said, "We have real customers and they pay us."

Consequently, Nav Canada has streamlined its operations, reducing nine layers of management to six and replacing half its senior management. With respect to the development of new systems, he reported customers telling the company, "Stop duplicating [things already available]; we can't afford it."[24] Hence, Nav Canada has significantly increased its use of commercial off-the-shelf (COTS) systems.

One indication that customers are pleased with the change was the presentation to Nav Canada of the International Air Transport Association's Eagle Award in 2001, citing the company's reductions in rates and charges and effective use of technology and procedures to help airlines save fuel and reduce emissions. Nav Canada was recognized by IATA again in 2002 (along with corporatized ATC providers Airservices Australia, ANS Czech Republic, and Irish Aviation Authority) for being responsive to the airline industry's plight in the post 9/11 period.

"He who pays the piper calls the tune" is a familiar adage. In the United States, since ATC services are paid for by Congress, and the FAA reports to Congress, the de-facto customer of ATC services is Congress, not aviation users. The only way that can be changed is to have the users pay the provider directly for ATC services. If that change can be made, there is good reason to believe it will significantly change the relationship between the ATO and aviation users. It substitutes economic allocation of ATC resources for political allocation of those resources.

Part 6

Concerns Over ATC Fees

Despite the fact that air traffic control is paid for directly by aircraft operators nearly everywhere else in the world, the lack of U.S. experience with ATC fees had led to concerns about their impact. Some air carriers have worried that a shift from ticket taxes to direct ATC fees would cost them more than they pay today. Business jet users are concerned about higher costs to operate their planes. And there is a long history of fear within the private pilot community of "user fees" as something that could make flying unaffordable. In addition, there are concerns that charging for individual ATC services (e.g., filing fees for flight plans) could discourage some aircraft operators from making use of those services, thereby reducing air safety. There are also obvious questions about how the remaining FAA would be funded, if most or all aviation taxes were to be replaced by ATC fees paid to the Air Traffic Organization.

In this section, we will look into these concerns.

A. Air Carrier Issues

Because the issues affecting airlines are so different from those affecting general aviation, we will deal with them separately. This first part of the discussion addresses several key air carrier issues.

1. Low-Cost vs. Legacy Carriers

Under today's system of paying for ATC via excise taxes, the large majority of ATC funding comes from taxes imposed on airline passengers: a tax of 7.5 percent of the amount of the airline ticket and a segment tax of $3.20 per flight segment. The former produces considerably more revenue than the latter ($4.7 billion from the ticket tax in 2002 vs. $1.5 billion from the segment tax). Because the former is a fixed percentage of the price of the ticket, the result is that a commercial plane will generate less revenue for ATC if it is operated by an airline charging low fares than by one charging high fares. Thus, the low-cost carriers (LCCs) have been concerned, historically, that their competitive position would be damaged by a shift from excise taxes to user fees. Under a user fee system, two planes of the same type flying the same route and receiving the same ATC services would presumably pay the same amount.

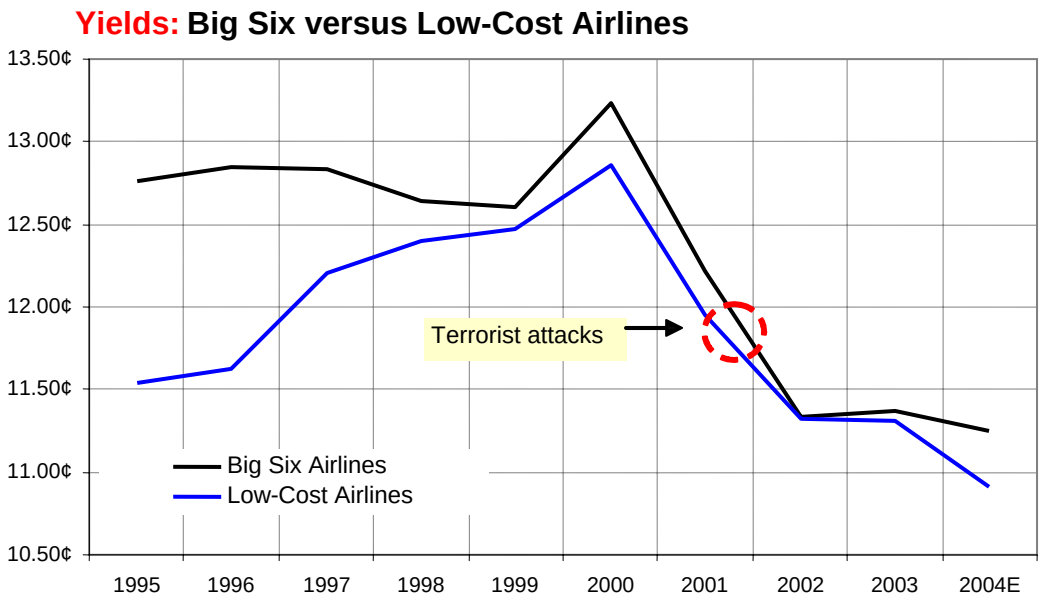
But numerous changes have taken place in the airline industry since 1997, when the industry engaged in a heated battle over the possibility of shifting to some form of user fee. First, there are major changes in the composition of the industry. Legacy carrier TWA has gone out of existence and several others are near

bankruptcy. Meanwhile, the LCC sector has expanded dramatically, with JetBlue, ATA, and AirTran joining Southwest as significant LCCs. America West has reinvented itself as a LCC, as well. Second, the LCC sector itself has changed, shifting toward longer stage lengths and more non-stop flights.

The third change is that segment taxes now constitute the second largest component of aviation excise tax revenue, after the 7.5 percent ticket tax. This tends to reduce the disparity in tax payments between LCCs and legacy carriers, compared to the 1997 situation where the ticket tax was the dominant revenue source. This change, too, would reduce the differential impact of a change from today's aviation taxes to ATC user charges.

But the fourth and most dramatic change is the rapid convergence of ticket prices between legacies and LCCs on domestic routes. Figure 6 shows how yields have converged since 1995, reaching parity in 2002, only to diverge again slightly in 2004. However, as our discussion in Parts 2 and 3 should make clear, we believe the competitive pressures exerted by LCC presence in nearly all major markets will force continued convergence of yields. The large differences of the pre-1997 era are gone for good.

Figure 6: Convergence of Yields, Legacy vs. Low-Cost Carriers



Big Six: AMR, CAL, DAL , NWAC, UAL, USAIR
Low-Cost: AAI, ALK, AWA, FRNT, JBLU, LUV
Source: Company reports and Airlineforecasts, LLC

2. Regionals vs. LCCs and Legacy Carriers

Another major change over the past decade is the huge growth in regional jets. According to figures compiled by the DOT Inspector General's office, in just three years from 2000 to 2003, regional jets went from just 10 percent of scheduled flights to 25 percent. In that same period, larger jet airliners dropped from 59 percent to 52 percent.[25] The change is even more dramatic at specific hub airports. The same report found

that RJs totaled 72 percent of operations at Cincinnati, 44 percent at Dulles, 39 percent at Houston Intercontinental, and 38 percent at Newark. This has led to concern over airport congestion, especially if the replacement of larger jets with RJs continues in coming years. Because an RJ may carry only 20 or 30 percent as many passengers as a larger jet, it pays far less for ATC services, but uses just as much of that service as a 737 or 757. Hence, other aviation sectors are increasingly concerned that the decision to substitute RJs for larger jets, while providing the increased frequencies many passengers may value, is being artificially encouraged by the way in which ATC is paid for.

On the other hand, the Regional Airline Association (RAA) has proposed a way of reducing the congestion, by establishing offset departure and en-route procedures, which can be done using flight management systems with which most RJs are equipped. If the ATC system were paid for via direct charges, those charges might be lowered for new offset routes that relieved congestion in crowded terminal airspace.

The RAA has generally expressed opposition to ATC user charges, arguing that a shift from today's ticket taxes to such fees would put RJs at a disadvantage. Yet that is not necessarily the case. Regional airline yields (cents/mile) tend to be double those of network carriers. Thus, by paying for ATC as a percentage of their ticket prices, RJ operators are paying significantly more per seat than their larger-jet brethren. And since they are able to charge twice as much per mile, they would appear to be in a better position to absorb increased ATC costs (if that's what switching to user charges would mean) than operators of larger jet airliners.

3. Cargo vs. Passenger Carriers

Cargo carriers pay an excise tax that is 6.25 percent of the price charged for transporting their cargo. How this percentage was arrived at is obscure, but in comparison to direct ATC fees, it appears to suffer from a similar problem as that affecting passenger airlines: it collects less than what a basic ICAO-type weight-distance charge would collect. In Reason's 2001 study evaluating a possible weight-distance fee, the major cargo carriers would have paid about 40 percent more, under a shift to a simple weight-distance formula (using 1998 data).[26]

Cargo carriers argue that lower payment rates (compared with passenger airliners) are justified in their case because they fly the majority of their flights at night, at times and places where the skies are not crowded (except in the approach zones to major cargo hubs, where the impact is mostly on other planes of the same carrier). In other words, they seem comfortable with the principle of congestion pricing.

Reason's previous analysis adopted that principle by adding a simple congestion component to the ICAO weight-distance formula. For the terminal-area fees (approach/departure), a higher rate was used for those flights into and out of airports on the FAA's list of Problem Delay airports during their peak hours. In 1998-99, none of the major cargo carriers' flights operated into or out of those airports during their peak hours. When the fee payments were re-calculated using this modified formula, the major cargo carriers' share of total ATC cost burden was increased only slightly by a shift from waybill taxes to the (modified) ATC fee structure.[27]

4. Adequacy of ATC Funding

Concerns about which segments of the airline industry bear which portions of ATC costs, while understandable, are not the only aspect of the issue that should concern those in this industry. Of vital importance is the alarming decline in user-tax revenue to support this vitally needed infrastructure.

Table 5 shows what has happened to the composition of aviation excise taxes during just the five-year period from FY 1998 to FY2002. This period shows the impact of the change made by Congress in replacing the former 10 percent ticket tax with a 7.5 percent ticket tax plus the segment tax. As can be seen, whereas the ticket tax brought in two-thirds of the transportation tax revenue in 1998, that had shrunk to only a bit more than half by 2002. And the segment tax revenue has grown from 6.7 percent to 17 percent of the total. That helps to explain why the five largest LCCs paid 12 percent of the total in 2002, compared with 10.8 percent in 1998. It is also worth noting that cargo carriers paid 5.2 percent of the total in 2002, versus 3.8 percent in 1998. Again, these trends support the idea that a shift from taxes to user charges would have less of an impact on LCCs and cargo carriers today than it would have in 1998.

Table 5: Changes in Transportation Taxes Paid by Carriers, 2002 vs. 1998 ($ millions)

	FY1998	Percent	FY2002	Percent
Ticket tax (7.5%)	$5,455	67.3%	$4,726	52.3%
Segment tax	547	6.7%	1,532	17.0%
Cargo waybill tax	313	3.9%	474	5.2%
Fuel tax (airline + gen. Aviation)	659	8.1%	789	8.7%
International arrival/departure tax	948	11.7%	1,282	14.2%
Other taxes	189	2.3%	228	2.5%
Total:	$8,111	100%	$9,031	100%
7 largest network carriers	5,674	70.0%	5,118	56.7%
5 largest LCCs	878	10.8%	1,083	12.0%
7 largest cargo carriers	313	3.8%	474	5.2%
All others	1,246	15.4%	2,356	26.1%
Total:	$8,111	100%	$9,031	100%

Sources: FAA Budget in Brief reports for 2000 and 2004, GAO-04-406R

Although total transportation tax funding increased from 1998 to 2002, the extent to which the industry paid for the ATC infrastructure declined dramatically. Table 6 shows that the total costs of the FAA's ATC operations grew sharply, from $6.2 billion to $8.7 billion over this five-year period. But if those numbers are compared with what the major carriers paid in transportation taxes (from Table 5), we can see that while they paid for 112 percent of the cost of the ATC system in 1998, by 2002 they were paying for only 76 percent. For a system supposedly based on the principle that users pay for the infrastructure they use, this is a very troubling trend. And it raises the question: where did the rest of the money for ATC come from?

The "all other" sources in Table 5 includes the international arrivals/departure tax, fuel taxes, and frequent flyer taxes, which together produced about $1.1 billion more in 2002 than in 1998. But the major factor in filling the gap, as Table 6 shows, was drawing down (as opposed to adding to) the balance in the Aviation Trust Fund. In the flush times of 1998, the taxes flowing into the Trust Fund were nearly $2.8 billion greater than what was drawn out of it for FAA expenditures. By 2002, however, that situation was sharply reversed,

with $1.8 billion more being taken out of the Trust Fund than was put into it from transportation tax revenues. Obviously, spending down the Trust Fund is not sustainable on a long-term basis, since it will eventually be drawn down to zero.

Table 6: ATC Budget Changes ($ millions)		
	FY1998	**FY2002**
ATC Share of Operations*	$4,153	$5,522
ATC Share of Administration*	$ 128	$ 176
Facilities & Equipment	$1,876	$3,020
Total ATC	$6,157	$8,718
Network, LCC, Cargo Taxes	$6,865	$6,675
Percent of ATC budget	111.5%	76.5%
Net change in Trust Fund	+$2,782	-$1,840

*Reason estimate

Source: FAA Budget in Brief reports.

B. General Aviation Issues

1. Non-Turbine General Aviation

As is well known, the general aviation (GA) community has long criticized "user fees," seeing in this concept a serious threat to the affordability of private flying. On the one hand, organizations such as the Aircraft Owners & Pilots Association (AOPA) protest that GA operators already pay their fair share of ATC costs via the 19.3 cents/gallon fuel tax they pay. On the other hand, they complain that if the estimated costs of the ATC services provided to typical ATC-controlled GA flights were charged to those flights, this would dramatically increase the cost of flying, to the point of unaffordability for many pilots. Both propositions cannot be true!

Here are the relevant facts about GA and air traffic control. First, nearly three-fourths of the GA fleet consists of single-engine piston aircraft, used for personal/instructional purposes. And more than half of all GA flight hours are personal, recreational, or instructional. As of 1990, only 23 percent of all GA piston landings and takeoffs occurred at airports with control towers.[28] Most GA piston flying takes place outside of controlled air space; if it uses any ATC services at all, it is most likely those provided by Flight Service Stations. Most proposals for ATC commercialization consider FSS functions to be sufficiently safety-related as to not be appropriate for user fees (see Safety discussion, below). Thus, *the large majority of GA flight activity would not be subject to ATC user charges.*

Second, how much does the GA fuel tax contribute toward the costs of the ATC services used by a portion of the GA fleet? In 1998, total receipts from GA fuel taxes (19.3 cents/gal. on avgas and 21.8 cents/gal. on jet fuel) came to $182 million, which represented just 2.7 percent of total aviation user tax receipts.[29] Yet FAA figures show that GA flights accounted for 59 percent of all ATC operations at towers and TRACONs and 20 percent of en-route (ARTCC) operations.[30] So claims that GA is paying its way via the GA fuel tax are simply not true.

The political reality is that GA is not going to be charged anything like its full share of the costs of the ATC system. It is too large and politically popular for this to be a plausible outcome of any restructuring of ATC in the foreseeable future. In Europe, GA pays much more than it does in the United States, and the GA sector is much smaller. GA organizations claim that this sector is relatively small in Europe because it is charged so much to fly, and that may indeed be part of the reason. But if small private planes cannot be made to pay transaction-based user charges in the United States, should their method of payment remain unchanged?

In Canada, where GA activity looks a lot more like American GA flying than European flying, Nav Canada decided to implement a form of GA user fee when it took over air traffic control as a user-controlled nonprofit company. The underlying rationale was, as noted earlier, the principle of "user pay means user say." As an important category of airspace user, GA wanted a place at the table (i.e., a seat on the board), and you did not get to *say* unless you agreed to *pay*. But for a variety of reasons, including concerns about both safety and affordability, the type of charge agreed upon for most GA aircraft is a flat annual charge proportional to the weight of the plane (ranging from C$60 for a plane of less than two metric tons to C$210 for one weighting three metric tons). That approach has been generally accepted by the Canadian GA community.

On the other hand, since a large proportion of GA flight activity does not make use of ATC services, a fairness question arises about charging such a fee to all GA aircraft. The GA fuel tax goes into the Aviation Trust Fund, which supports the Airport Improvement Program (AIP) in addition to the ATC system. Since all public-use airports are eligible for AIP grants, most GA pilots do benefit from AIP even if they do not benefit from ATC. This provides an argument for retaining the GA fuel tax, as providing a better nexus between payment and benefits received for the average GA pilot than would an annual ATC fee.

2. Business Aviation

By contrast with piston-powered GA aircraft, business jets and turboprops are an entirely different category of aviation. Representing just 7 percent of the broadly defined GA fleet, they nearly always fly from towered airports, fly at the same altitudes as regional and mainline commercial airliners, and make extensive use of ATC services. The National Business Aviation Association estimates that business aviation is 20-25 percent of en-route traffic, hardly a "marginal" user of the ATC system. No country in the world (except the United States) exempts this important category of planes from paying directly for ATC services like their larger commercial brethren.

Broadly speaking, "business aviation" includes several distinct categories. The traditional image of such planes is the corporate jet or turboprop, owned by a company and flown by professional pilots who are employees of that company's flight department. A second category includes individually owned planes, flown by the owner for business purposes. These two categories are regulated (for safety) under Part 91 of the Federal Air Regulations. A third category consists of air-taxi/charter operators, operating unscheduled (on-demand) service under Part 135 of the FARs. And a fourth, fast-growing category is companies offering fractional ownership shares in business planes (e.g., NetJets, Flight Options, and competitors). These may operate either under Part 135 or under a recently created Subpart K of Part 91 (or both). Table 7 provides an overview of the numbers of planes in these categories, compared with mainline and regional jet airliners. As can be seen, the non-airline turbine-powered fleet is much larger than the air carrier turbine-powered fleet. And the total turbine-powered fleet is projected by FAA to increase by 49 percent over the next 11 years, putting considerable stress on the ATC system.

Table 7: U.S. Turbine-Powered Fleet		
	2004	2015 Forecast
Large air carrier jets	4,125	5,732
Cargo jets	969	1,332
Regional carrier jets	1,598	3,222
Regional carrier turboprops*	1,287	1,080
GA & air taxi jets	8,650	15,510
GA & air taxi turboprops	6,900	8,120
Total turbine fleet	23,529	34,997
Breakdown of 2004 GA Turbine Fleet:		
▪ NBAA* member jets	5,369	
▪ Air taxi jets	2,163	
▪ Other GA jets	1,118	
Subtotal jets	8,650	
NBAA* member turboprops	1,969	
Air taxi turboprops	1,762	
Other GA turboprops	3,169	
Subtotal turboprops	6,900	

*includes some piston-powered planes

Sources: FAA 2003 Aviation Forecast (http://api.hq.faa.gov/foreca03/start.htm), NBAA website (www.nbaa.org), and FAA, "Part 135 Air Taxi Operators (ATO) Study," December 2004.

*NBAA is the National Business Aviation Association.

In some circumstances, the four categories of business aviation are alternatives (for business people) to flying on scheduled airlines. Airlines are increasingly concerned about business aviation as competition, especially for their front cabin offerings. In 2000, there were about 10 million domestic first-class and business-class trips, compared with 8 million business jet and turboprop trips. Since legacy carriers generate most of their profits from their high-end customers, modest shifts by those customers to business jet travel could prove devastating to those carriers.

When it comes to paying for the ATC services business planes use, the picture is one of inconsistency. Planes operating under Part 91 pay only the GA fuel tax, while those operating under Part 135 pay 7.5 percent of the price charged for the trip plus the $3.20 per passenger segment fee. (Part 135 operators also pay the fuel tax when they purchase fuel, but can and do apply to have these sums refunded by the government). Thus, planes in fractional-ownership programs are in the strange position of paying more for using the ATC system if they have opted to be regulated (for safety) under Part 135 than if they operate under Part 91, Subpart K. This is a perverse incentive, and certainly one that was unintended.

There are thus strong fairness arguments for including all business jets and turboprops in the same user charge system that applies to commercial jet planes. These planes are all intensive users of ATC services and should pay for what they use. And doing so would not add very much to the cost of using these planes. Calculations done for Reason Foundation's 2001 ATC policy study found that the annual cost of a hypothetical weight-distance fee system would be about the same as the annual fuel tax for a typical King Air turboprop.[31] The cost would be somewhat higher for business jets. A Lear 35 operating a representative 550 annual flight hours, at today's rate of 21.8 cents/gallon would pay $25,778 per year in fuel taxes. Using the ATC charging system proposed in that study, the same Lear 35 would pay $43,768 in ATC charges

instead. That $17,768 annual difference, divided by a typical 450 annual departures, would add less than $40 to the cost of each flight. To put this in perspective, the estimated total ownership/operating cost (TOC) of a Lear 35 is in the $1 million per year range, which works out to about $2,222 per flight. So the difference in cost between the current fuel tax and the proposed ATC fee is *1.8 percent*. That would hardly cut into sales of business jets or make operators less likely to use them.

Evidence from Europe supports this claim. Business jets in Europe pay weight-distance charges for using the ATC system. Yet business jets in general sell well in Europe, and the fractional-ownership model has been taking off there, as well. *Aviation Week* reports that NetJets Europe has increased its customer base from 89 to 600 in recent years, and the company expects it to exceed 1,000 in 2005.[32]

Without dramatic capacity increases, all forms of business aviation (as well as airline aircraft) can look ahead to increasingly congested airspace. The FAA projects the number of RJs to double to 3,200 by 2015. Fractionals are also expected to continue steady growth. And while the expected proliferation of very light jets (VLJs) is still somewhat speculative, the combined total of this expanded jet activity will put new strains on a system which is already beginning to see the return to pre-9/11 levels of congestion. If the optimistic forecast of 6,000 VLJs being added to the fleet materializes, that alone would expand the jet fleet by 40 percent. New ATC technology and airspace redesign can address this challenge, but all who make use of that airspace should be paying for it on a comparable basis. To have a portion of that user base paying much smaller amounts via the fuel tax constitutes a de-facto subsidy for this particular subset of airspace users.

Because they operate in the same airspace as commercial jet aircraft, and constitute 20 to 25 percent of en-route traffic, business jet operators (including fractional owners) already participate in the FAA's Traffic Flow Management system, as they should. But for the same reason, should become full-fledged ATC system customers, paying their way alongside the airlines.

Moreover, to the extent that a user-funded and more customer-oriented ATC system is able to modernize sooner and expand the system's capacity, business jet users (as well as airlines) will reap the benefits in terms of delay reductions. As noted above, Reason's 2001 ATC study estimated that a revamped ATC system need only reduce delays by 5 percent to produce net economic savings for the Lear jet owner discussed above (i.e., reduced cost thanks to reduced annual flight hours would offset the slight increase in cost per flight hour). NetJets reports that congestion today is already so bad that the potential 30-45-minute cross-country time savings possible with a Mach 0.91 Citation X are often unavailable in practice, due to ATC delays.

3. Safety Issues

One of the most commonly heard criticisms of proposals for ATC charges is that charging fees for ATC services will jeopardize air safety because it will motivate some aircraft operators to do without (a weather briefing or a flight plan) in order to save a few bucks. While this concern is probably exaggerated, it cannot be dismissed as without any plausibility. Though it would not apply to airline and corporate pilots (who must fly by the book), it might apply to some individual private pilots. Thus, the design of an ATC charging system must ensure that no such temptations to skimp on safety to save money will actually be acted upon.

The best way to do this is to ensure that direct charges are not made for individual safety-related services such as filing a flight plan or obtaining a weather briefing. In the 2001 Reason ATC study, one of the authors of this study proposed that the FAA's Flight Service Station (FSS) operation be considered as a safety function, which should continue to be made available to GA pilots at no charge. Although it is part of the ATC system, and therefore should remain the responsibility of the ATO to provide, our report recommended that the FSS program be funded out of general government revenues, along with the FAA's safety regulatory functions. Since there is no possibility of the GA community being able to pay for the $500 million a year cost of the FSS program, and its cost must come from somewhere, the only available alternatives are (1) cross-subsidy from non-GA portions of aviation (i.e., the airlines) or (2) general taxpayer subsidy. Since ensuring air safety is part of the generally accepted functions of the federal government, we argue that the preferable course for both FSS and FAA safety regulation is general taxpayer support.

Thus, with FSS functions continuing to be provided to pilots at no charge, the safety concern about ATC charges disappears. The large majority of mostly piston-powered GA aircraft would pay either a continued fuel tax (to support AIP) or a modest annual ATC membership fee (as in Canada). Business jets, like all other jet aircraft, would pay the standard ATC use charges. No safety issues occur with those types of fees in other countries, and there is no reason why any safety issues would arise if they were used here, as well.

C. Paying for Remaining FAA Functions

If the Air Traffic Organization were to be funded directly via fees paid to it for its ATC services, how would the rest of the FAA be funded? Besides air traffic control, the other two principal FAA functions are air safety regulation and the airport grants program known as AIP (Airport Improvement Program).

1. General Fund Contribution

We first need to review the current cost of these programs and compare them with the current set of FAA funding sources, as shown in Table 8. As can be seen, to fund the $13.9 billion budget for FY 2004, FAA used $9.8 billion from aviation taxes, $3 billion from the general fund (an unusually high amount), and a net drawdown from the Aviation Trust Fund of $1.1 billion.

How much of the current FAA spending would be shifted to ATC user fees? In the previous discussion, we made the case that Flight Service Stations should be considered a safety function which should not be charged for, and hence should be funded out of general revenues, like FAA safety regulatory functions. Hence, the estimated $500 million budgetary cost of a reformed FSS program needs to be subtracted from the amount shifted over to the fee-supported ATC budget. We estimate that budget in Table 9.

Table 8: FAA Spending and Revenues, FY2004 ($M)	
Spending	
▪ Operations	$7,479
▪ F&E	2,893
▪ R,E&D	119
▪ AIP	3,380
Total:	$13,873
Revenues	
Aviation Taxes:	
▪ Ticket tax	$4,933
▪ Segment tax	1,943
▪ Waybill tax	442
▪ Fuel tax	770
▪ Intl arr./dep. Tax	1,435
▪ Rural airports	75
▪ Freq flyer tax	153
Total Av. Taxes	$9,751
General Fund	3,010
Net Trust Fund draw	1,112
Total Budget	$13,873

Source: FAA Budget in Brief, FY2005

Table 9: Estimated ATC Fee-Supported Spending, FY 2004 (in billions)	
Air Traffic Services	$6.2 billion
Facilities & Equipment	2.9
Subtotal:	$9.1
Less FSS	.5
Adjusted Total	$8.6 billion

If we then take this ATC portion out of the FAA budget (both costs and revenues), we obtain the following picture, summarized in Table 10.

Table 10: Revenues and Spending, Before and After Reform					
Revenues Before:		**Spending Categories:**		**Revenues After:**	
Aviation Taxes	$9.8B	Air Traffic Control	$8.6B	ATC Fees	$8.6B
General Fund	3.0B	FAA Safety	2.0B	General Fund	2.0B
Trust Fund draw	1.1B	FAA AIP	3.4B	AIP Taxes	3.4B
Total	$13.9B	Total	$13.9B	Total	$13.9B

As can be seen, the general fund contribution could revert to a more typical $2 billion, which would adequately fund the FAA's various safety functions, including the FSS program. This assumes that AIP is funded by some form of continued aviation excise taxes, which would be dedicated to that program alone.

2. Funding the Airport Improvement Program (AIP)

Since AIP is a classic example a user-tax funded transportation grants program, the most straightforward approach is to retain this principle with a revised set of aviation excise taxes. Since the air carriers would be taking on the bulk of ATC funding via new ATC fees, the present airline ticket and segment taxes and the present cargo waybill tax should be abolished.

One option would be to retain all the other current aviation excise taxes, supplementing them only as necessary with a modest new AIP tax on passenger and cargo carriers. How much would be needed for this purpose? The four other aviation taxes listed in Table 8 total $2.433 billion. Since AIP is $3.4 billion, we need another $967 million to fully fund it at the current level. Since we know that the current airline ticket tax is 7.5 percent of the value of airline tickets, the $4.933 billion from that source implies total ticket revenue of $65.773 billion. Likewise, since the 6.25 percent waybill tax generates $442 million, total cargo waybills must total $7.072 billon.

To avoid burdening the cargo sector with a larger proportion of the total than it pays now, we note that of the total of $7.318 billion paid in ticket, segment, and waybill taxes, the cargo sector pays 6 percent. Hence, our objective is for cargo to pay 6 percent of the $967 million needed to fully fund AIP, and passenger carriers to pay the balance, i.e. cargo pays $58 million and passenger carriers $909 million. Based on the ticket and waybill volumes derived in the previous paragraph, achieving that requires an AIP ticket tax of 1.38 percent and an AIP waybill tax of 0.8 percent. Together with the dedication to AIP of the current fuel, international arrival/departure, rural airports, and frequent flyer taxes, the full $3.4 billion program cost can be covered.

Another alternative would be to rethink the size and scope of AIP at the same time as ATC funding is reformed. AIP was created when air-carrier airports did not have legal authority to levy passenger facility charges (PFCs). A DOT study in 1987 evaluated the idea of replacing AIP for air-carrier airports with PFCs and concluded that this would be feasible.[33] A non-air-carrier AIP would cost well under $1 billion a year, which could be paid for out of current aviation fuel taxes and the rural airports and frequent flyer taxes. Under this alternative, no ticket or cargo waybill tax would be needed.

D. Airline Cost Savings

In the present difficult airline financial environment, any reform that would expect the airlines to pay more post-reform than they pay today would be doomed to failure, regardless of its longer-term benefits. So the first question to be addressed here is the short-term impact on airlines of shifting to ATC fees, as proposed here.

At first glance, the proposed change would appear to cost the airlines more. The FY 2004 figures reveal that ticket, segment, and waybill taxes totaled $7.318 billion for that year. We estimated that a total of $8.6 billion in ATC fee revenue would be needed to fund the ATO's 2004 budget. Assuming that $300 million of that came from fees paid by business aviation, that's still $8.3 billion from passenger and cargo carriers. And in addition, we have calculated that $967 million in air carrier AIP taxes would be needed, if AIP is kept at its current size. That would total nearly $9.3 billion, which is $1.9 billion more than the $7.3 billion paid by air carriers in existing passenger and cargo taxes.

Yet, two key factors are left out of the equation: Trust Fund drawdowns and revenue bonding. In recent years, total FAA operations have been funded in part by drawing down the balance in the Trust Fund, to the tune of $1-2 billion per year. Since our funding plan requires no increase in the general fund contribution to FAA, and fully funds AIP via aviation user taxes, the remaining $3 billion Trust Fund balance should be given to the ATO to ease its transition into a self-supporting entity. That would mean continued annual drawdowns of $1.5 billion per year would be possible for two transition years, offsetting the difference between previous airline taxes and the new ATC fees plus AIP taxes.

After an initial two-year transition, Trust Fund draw-downs would be replaced with revenue bond issues, as discussed by the Mineta Commission. One major advantage of revenue bonds is that the cost of large-scale modernization programs can be front-loaded. Instead of rolling out a new display or runway collision-avoidance system a few at a time over 10 years, a much larger order can be placed all at once and the systems installed in just a few years, because the money is available up front, via the bond issue. Not only does this mean that the benefits are realized much sooner; it also means that unit costs will be lower, thanks to larger-volume production and purchasing.

But from the airlines' standpoint, the transition to revenue bonds for capital funding also produces a one-time window of cost savings. Assume that during a two-year start-up period, the remaining $3 billion uncommitted Trust Fund balance is used for the majority of capital spending (F&E). The following seven years see $3 billion worth of revenue bonds issued each year for accelerated modernization, a total additional investment of $21 billion. Assume these are tax-exempt bonds, issued at 6 percent interest over 20 years and (for simplicity) amortized like a mortgage loan. Annual debt service in the first of those seven years would be $258 million, even though $3 billion worth of capital improvements to the system were being made. Each year, as another bond offering were made, the debt service would increase by another $258 million, so that by the final year it would be at $2.08 billion per year. But during that seven-year period, each year would require hundreds of millions less revenues than would have been needed under traditional pay-as-you-go modernization. And that would translate directly into reduced need for ATC user fee payments by the airlines. A 10-year transition period is illustrated by the numbers in Table 11.

To conclude the comparison for the airlines, in FY 2004 their total aviation taxes were $7.3 billion. Under our proposal, they would pay ATC fees beginning at $5.9 billion in FY 2005 plus $0.9 billion in AIP taxes, for a total of $6.8 billion in 2005, a net saving of $0.5 billion. As debt service on the bonds increased, their savings would be somewhat less for each successive year until 2011, when they would be back to paying a total of $7.3 billion. Note that the above table assumes constant ATO operating costs, in 2005 dollars, thereby implicitly assuming only very modest productivity improvements during this 10-year period. Savings would be greater if significant productivity gains were made, thanks to the new customer/provider relationship leading to serious reforms.

Table 11: Transition Budget for ATO (cash basis, in 2005 billions of dollars)										
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Capital Investment										
Trust Fund draw	1.5	1.5	0	0	0	0	0	0	0	0
Bond proceeds	0	0	3	3	3	3	3	3	3	3
Total	1.5	1.5	3	3	3	3	3	3	3	3
ATO Outlays										
ATC operations*	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
Capital/debt serv.	2.0	2.0	0.26	0.52	0.78	1.04	1.30	1.56	1.82	2.08
Total ATO	7.7	7.7	5.96	6.22	6.48	6.74	7.00	7.26	7.52	7.78
ATO Revenues										
Fees, airlines	5.9	5.9	5.66	5.92	6.18	6.44	6.70	6.96	7.22	7.48
Fees, biz GA	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Trust Fund draw	1.5	1.5	0	0	0	0	0	0	0	0
Total	7.7	7.7	5.96	6.22	6.48	6.74	7.00	7.26	7.52	7.78

*excludes FSS

This type of capital funding scenario was laid out in some detail in 1994 by the U.S. Department of Transportation in its studies of a user-fee and revenue-bond-funded government corporation approach to air traffic control. That report prepared pro-forma financial statements covering a 10-year period, for several different investment scenarios. In all the scenarios analyzed, this approach was found "financially viable, with revenues sufficient to cover operating and investment costs."[34]

Part 7

Structuring ATC Funding Reform

A. Governance

A major concern of knowledgeable observers is what is impolitely called "feeding the beast." The concern is that if the ATC funding problem is solved without any other changes, the result will more likely than not be continued unwise spending. The FAA budget increased by 52 percent between 1998 and 2003, an annual increase of 8.7 percent (nearly triple the rate of inflation). The DOT Inspector General has raised serious concerns about FAA spending increasing at an unsustainable rate. And the long, troubled history of FAA's attempts to modernize the ATC system speaks volumes, not only about difficulties in managing large-scale technology procurements but also of not being focused on what the aviation customers (especially the airlines) want and are willing to pay for.

Hence, it is generally agreed that a new governance mechanism must be devised and implemented along with funding reform. The new Air Traffic Organization has made important first steps in the direction of better management, but the previous FAA track record, both on operations spending and on capital improvements, makes governance reform essential. It is essential on one hand because the ATO's customers will now be paying directly for its services, and will want to be assured that their money is being spent wisely. And on the other hand, it is essential for Congress to be comfortable with giving up direct line-item control of the ATO's spending, thanks to the substitution of another form of oversight that will ensure sound management and wise spending.

There are two forms of governance that should be brought to bear. One is the creation of a board to oversee the ATO's policies and operations. The other is the oversight that will be provided by the financial community that provides the bond funding.

1. Board Oversight

The Mineta Commission was well aware of the need for improved governance, and devoted a whole section of its report to spelling out the need for a governing board for the ATO:

> *As a Board with full authority over the [Air Traffic Organization], its duties and responsibilities would include: hiring, firing, and setting compensation for the Chief Operating Officer of the [ATO]; setting and adjusting charges for services provided by the [ATO], providing direction to the total affairs of the*

> *[ATO] to ensure its development and growth in services and financial results; overseeing total performance of the [ATO]; approving all financing programs and policies; and reviewing and approving major capital investment programs. Specific responsibilities would include preparation of a business plan, an annual financial plan, an annual budget, annual financial and performance targets, details of performance-based pay systems, and other incentives for [ATO] employees.*[35]

In other words, the Board proposed by the Mineta Commission would function like the board of directors of a corporation.

How to structure such a board warrants careful consideration. Two different models are worth considering, a public interest board and a stakeholder board—or some blending of the two.

Most existing federal corporations that charge for their services and can issue long-term bonds follow the public-interest board model. Among these are the Export-Import Bank, the Overseas Private Investment Corporation, the Tennessee Valley Authority, and the U.S. Postal Service. Though varying in their details, their boards are generally knowledgeable citizens appointed by the President and subject to Senate confirmation. The Mineta Commission proposed this model for the ATO's board, with the proviso that at least three members of the board be knowledgeable in aviation (though none could have direct pecuniary ties to the aviation industry).

The other alternative is a stakeholder board, carefully structured to represent all key segments of aviation, with board members appointed by industry organizations from each segment. The best current example is the board of Nav Canada, the not-for-profit company that in 1996 replaced Transport Canada in running the Canadian ATC system. Its 15-member board must include four members appointed by the Air Transport Association of Canada, one appointed by the Canadian Business Aircraft Association, two appointed by the ATC unions, and three appointed by the government. Those ten board members select four independent directors, and those 14 select the CEO, who becomes the 15th board member.

Three other overseas ATC corporations have partial stakeholder boards, AeroThai (Thailand), NATS (U.K.), and Skyguide (Switzerland), in each case proportional to the degree of stakeholder (airline and airport) ownership of the ATC corporation. The remaining two dozen or so overseas ATC corporations are government corporations, and their boards follow the public-interest model. Most preclude from service anyone with a current financial interest in aviation, but encourage people with aviation knowledge and experience.

The Secretary of Transportation's 1994 Executive Oversight Committee, which proposed a federal ATC corporation called USATS (to be located within DOT) proposed a hybrid board of directors, consisting of 11 members[36]. Eight would be stakeholder representatives, including commercial and non-commercial aviation, airports, unions, and the business community. The other three would be the CEO of the ATC corporation and the Secretaries of Defense and Transportation. In this proposal, the stakeholder members would have been appointed by the President and confirmed by the Senate, rather than being appointed by the stakeholder organizations themselves.

The exact structure of an ATO board is worth further discussion and debate. To facilitate strong accountability to customers, our preference is for the stakeholder model, with the board carefully structured to include all major aviation interests and those organizations being able to appoint the board members to represent them in governing the ATO.

We also recommend that the FAA Administrator not be a member of this board. One of the important principles inherent in creating a separate entity to provide ATC services is the separation of ATC service delivery from FAA safety regulation. This principle has been laid down by ICAO and has been followed by the 37 countries that have formally separated ATC from their transport agencies over the past 15 years. The FAA itself formally created a new ATC safety regulatory unit (AVR) to provide arms-length safety regulation of the new ATO. To preserve the arms-length separation between safety regulation and service provision, the chief safety regulator (the Administrator) should not be on, or chairing, the ATO's board of directors.

2. Financial Community Oversight

The other new form of oversight will come from the financial community. Since the ATO will be selling revenue bonds to Wall Street to finance modernization projects, financial analysts will ask probing questions to determine whether there is a sound business case for those projects. Their due diligence will include a review of the case developed by the ATO, including assumptions about capital costs, savings to both ATO and aviation users, and other projected benefits. Some of this due diligence will include input from airline and business-jet customers, both individual companies and their trade associations. This kind of scrutiny, where investors' own money is at risk, should lead to far more rigorous decisions on what modernization projects to pursue than has been possible under current and previous organizational structures for ATC.

This oversight function also underscores why the ATO's borrowing should be only from the private capital markets, and not from the U.S. Treasury. The latter is generally resistant to increased federal debt issuance, and it is not equipped for the kind of due diligence that is routine for Wall Street in analyzing and rating corporations' proposed capital investment plans.

B. Establishing the User Fee System

While Social Security is still referred to as the "third rail of politics," in aviation the third rail might well be "user fees." Yet for all the reasons set forth in Part 5, shifting from user taxes paid to the Treasury to fees paid directly to the ATO for ATC services is essential to meaningful ATC reform. But since we know that shifting from taxes to fees holds the potential to create winners and losers, how the fee system is set up and structured matters a great deal.

The USATS and Mineta Commission reports proposed that the fee structure be devised by the board of directors. The former recommended that final approval of the fee structure rest with the Secretary of Transportation, after consultation with the Attorney General, based on specific criteria to be set forth in the enabling legislation, such as if the fees would "harm new entrants, diminish competition among users, or lead to excessive fees for air service." The latter recommended that the proposed fees be published by FAA as a Notice of Proposed Rulemaking, providing for public comment. The resulting Final Rule would be subject to an up-or-down vote by Congress within a specified time period.

Whichever way the initial fee structure is formally developed and approved, two key principles should be kept in mind. First, a structure that reflects extensive prior discussion with ATO customers will fare much better than one that is developed in isolation. Second, once the basic structure is approved, it should be

protected from arbitrary and unpredictable changes, so as not to undercut the financial community's need to rely on a predictable revenue stream for debt service on ATC modernization bonds. Both points deserve elaboration.

It would be worth serious efforts by the transportation community to seek as much consensus as possible on the principles for and structure of an ATC user charge system. One possible approach would be for the Transportation Research Board to create an expert panel to develop the general principles and then be available to advise and assist a stakeholder working group convened by the ATO to develop the actual fee structure. The enabling legislation for ATC funding reform would authorize these activities and specify a deadline date by which the proposed fee structure must be drafted, in order that initial financing could take place by a subsequent date.

The more predictable and reliable the projected revenue stream, the easier it will be to finance modernization via the capital markets. That means the charging principles must be established in law at the outset, and proposed changes in specific fee levels (or the addition or deletion of specific fees) should be subject to prior consultation with customers and to review for consistency with the charging principles. Once those procedural requirements have been complied with, the presumption should be that the changes are valid. Those choosing to appeal such changes would have the burden of showing why they should not go into effect. This is the general approach followed with Nav Canada, pursuant to the 1996 enabling legislation. It has worked well there, and the company has maintained an investment-grade bond rating from the outset.

C. Other Issues

1. Taxes vs. Fees

This report, like the Mineta Commission in 1997 and the DOT's Executive Oversight Group in 1994, proposes that the ATO be funded by direct fees and charges, not taxes. This means that following the approval of a fee schedule by the Secretary of Transportation, the existing ticket tax and segment fee would be phased out and the new ATC charges would be phased in. Aviation users (the ATO's customers) would pay the ATC charges directly to the ATO, which would bill each customer for its services, based on the approved fee schedule. Thus, the ATC charges would not flow into the U.S. Treasury to be appropriated by Congress. They would be like the sums paid by U.S. Postal Service customers for stamps and parcel delivery, the bills paid to the Tennessee Valley Authority by its electricity customers, or the landing fees and space rentals paid by airlines to Reagan National and Dulles International Airports.

This distinction is of crucial importance to the financial community, since one of the primary reasons to shift from taxes to charges is to make it possible to leverage a consistent revenue stream, by issuing revenue bonds to be repaid out of this future stream of fee payments. The financial community will be able to make realistic projections of the future level of aviation activity, and hence of the revenue stream needed to support debt service on the bonds. It is much less able to predict the actions of future Congresses over, say, the next 20 years in appropriating funds for one tiny portion of the immense federal budget. Thus, the ability to issue revenue bonds to fund accelerated modernization depends on creating a predictable revenue stream independent of the federal budget process.

2. Why Not a Fuel Tax?

Because fuel taxes have a long history in U.S. transportation, there is considerable support for the idea that there ought to be a way to use the fuel tax as a kind of user fee for air traffic control. The arguments cited typically include low cost of collection and proportionality to time spent in the system.

But against those advantages, a fuel tax has several major flaws. First, as a tax, legally speaking it must be deposited into the Treasury and subsequently be appropriated by Congress. This has two unfortunate consequences for ATC reform. First, a sum that is subject to annual appropriation does not meet the financial markets' definition of a predictable, bondable revenue stream. So it fails to solve the financing problem, which is the theme of this entire report. Second, because a fuel tax would not be paid directly to the ATO, it would not lead to the development of a true customer-provider relationship that is critical to overall ATC reform. By leaving control of the purse strings with the appropriations committees of Congress, it would retain the status quo situation in which the Congress is the de-facto customer that the ATO must please, rather than making aviation users be the ATO's customers.

Beyond its inherent deficiencies as a tax, a fuel tax does a poor job of reflecting the costs of providing ATC services. At a time when, for example, RJs are contending with larger jets for access to crowded terminal-area airspace, paying for ATC via a fuel tax would mean charging far less to an RJ for the exact same services delivered at a much higher charge to a 767. So a fuel tax fails the test of being a cost-based user fee, as recommended by USATS, the Mineta Commission, and nearly all other ATC reformers.

3. Why Not Bond Just Facilities and Equipment?

As concern about the funding crisis facing the ATO has spread, some have focused on the fact that the purpose of issuing revenue bonds is to fund capital investment. So instead of changing the entire basis of paying for ATC, why not just create a narrow revenue stream sufficient to pay for bonds for modernization? In other words, why not just bond the portion of the ATO's budget designated as Facilities and Equipment?

To answer this question requires a deeper understanding of what "modernization" is all about. Modernization does not mean simply replacing an old computer with a new one. It is far more fundamental than that, involving the use of technology to change the way air traffic control is done. Thus, modernization is inherently at least as much about operations as it is about facilities and equipment.

Historically, the FAA has operated in classic "stovepipe" fashion. Nowhere was this more true than in the two main entities dealing with ATC, Operations and Facilities and Equipment. For decades, these two functions operated as separate entities, to the point that new technologies were not evaluated or selected for whether they would lead to increases or decreases in operating and maintenance costs. This is one reason today's Operations budget is so large.

The creation of the ATO, which took effect early in 2004, marked a historic turning point, in that it put F&E and Operations into a single organizational unit. With the information that is becoming available from the new cost accounting system, it will soon be possible to plan for modernization of ATC in an integrated manner, evaluating how to redesign ATC operations so as to use technology to lower operating costs and increase productivity. This has never been possible before, due to both the absence of meaningful cost data and the organizational separation of F&E from Operations.

Creating a separate unit to plan and fund Facilities and Equipment would represent a big step backwards, undoing much of what is just being accomplished in setting the stage for major structural reform in how ATC is provided. And it would forego the enormous benefits of creating a customer-provider payment nexus, making the ATO accountable to its aviation customers.

4. Coping with Recessions

Another key concern is that during a serious recession, when air travel falls off, an ATO funded by revenue from ATC charges might come up short of funds to cover its operating costs and debt service on its bonds. Large increases in rates during such periods would serve to increase airline costs at the very time when passengers were already staying home more than usual, thereby exacerbating the airlines' problems.

The first answer to this concern comes from observing how self-supporting ATC providers in other countries coped with the post-9/11 downturn in air travel. While a few did raise fees to levels that provoked outcries from their customers, most focused intently on cutting costs, something which the FAA conspicuously did not do during this period. Nav Canada, which had been in operation since November 1996 and charging fees for its services since 1998, had built up a reserve fund to help it get through such downturns. However, since it had only had three years to set aside money in this fund, it proved inadequate to prevent rate increases, so as to maintain cash flow and debt-service payments.

The lesson appears to be that whatever regulatory oversight exists must allow the ATC provider to set aside monies each year in a reserve fund of sufficient size to enable it to get through a several-year downturn in air travel without having to resort to unanticipated rate increases. Bondholders might require there to be a debt-service reserve fund, and having one would probably lead to lower interest rates on the bonds.

Part 8

The Window of Opportunity

During 2005 several forces all come together, making a compelling case for fundamental reform of how we manage and pay for air traffic control. These factors are as follows:

- The funding crunch documented in Part 3 urgently needs addressing, before the aging infrastructure leads to major problems and before serious damage is done to the already impacted ATC modernization program. Since increasing aviation taxes is not a credible approach in the current airline environment, nor is increasing the general fund contribution at a time of massive federal budget deficits, switching to a fee system that gives real voice to ATC's customers is the most viable alternative.
- The fledgling Air Traffic Organization faces huge challenges in transitioning to a truly businesslike entity. The Mineta Commission correctly identified a customer-provider payment mechanism as a key factor in producing a truly performance-based organization, but Congress has thus far ignored that part of its recommendations. It's time to finish the job, by fully implementing what the Commission judged essential.
- With new technology available that promises dramatic increases in ATC productivity, and the need to replace more than half the controller workforce over the next decade (due to retirements), there is a unique window of opportunity for major change that must not be missed. ATC's customers should insist that it be fully taken advantage of.
- The ATO is nearing completion of a meaningful cost-accounting system, which will identify the true costs of providing its various ATC services, a precondition for developing a basis for charging for those services.
- The current aviation taxes sunset in 2007, so the issue of what should replace them is ripe for debate in 2005 and 2006. Unlike previous times when the tax lapsed, there is no excess Trust Fund balance to buffer any legislative delay.

Real ATC reform will make it possible to meet the challenge set forth by the Joint Planning & Development Office (JPDO) of doubling or tripling the capacity of the ATC system by 2025, just 20 years from now. And it will create a means to do this at substantial cost savings.

A. Major Capacity Increases

The Next Generation Air Transportation System (NGATS) plan, released by the JPDO in December 2004, speaks of the need to accommodate up to three times today's level of air traffic by 2025. This need is driven by the continued growth of regional jets and fractional ownership, as well as the possibility of as many as 13,500 VLJ air taxi aircraft and many thousands of unmanned aerial vehicles (UAVs) by 2025. Clearly, increasing airspace capacity to this extent will require more than just incremental, business-as-usual improvements. As the JPDO report itself suggests, "Achieving the vision of a transformed air transportation system requires us to open our minds to new possibilities, embrace new approaches, and create new ways to work together."[37]

The "agile air traffic system" proposed as part of NGATS amounts to a reinvention of how ATC is provided, illustrating the point made in the previous section about modernization being far more than substituting new computers and displays for old ones. To achieve the kinds of capacity increases discussed in the JPDO's plan requires rethinking the entire operating concept of ATC, shifting from a human-centric model to a network-centric one that will make use of far more, and more precise, information about aircraft position and intentions, and about weather, than the current system collects or could use. This will permit much closer spacing of aircraft, in both en-route and terminal environments, while maintaining high levels of safety.

Institutionally, to realize this vision requires two things: (1) an integrated ATO, in which capital investment is fully integrated with operations, and (2) a robust source of capital funding, on a timely basis, for ground, air, and space-based elements of the new system. Both will be provided by the kind of funding reform proposed in this report.

B. Major Cost Savings

We know from detailed studies (like those from GRA, Inc.[38] and R2A)[39] that there are significant economies of scale in ATC facilities. With today's technology, there is no inherent reason why an en-route center or TRACON needs to be geographically located beneath the airspace it controls. Large cost-saving opportunities exist for facility consolidation within the ATO, yet as long as it is embedded in the federal budget process, such major changes are about as likely as the closing of surplus military bases. In addition, the shift to the NGATS agile air traffic system will change the role of controllers, by automating some procedures and putting more information and control in cockpits. This means the ratio of controllers to activities should trend downward over time, as productivity increases. But this will only happen if the ATO's aviation customers demand it. Powerful status-quo forces will resist these productivity-increasing changes.

Here again, the experience of countries with user-paid ATC systems is illustrative. Australia, Germany, South Africa, and the United Kingdom have either completed or are embarking on significant consolidation of ATC facilities. During the post-9/11 slump in aviation activity, they cut their overhead and reduced total head-count, in sharp contrast to the FAA. While a stakeholder board of directors, such Nav Canada's, provides a direct way for users to influence policy decisions of the ATC provider, the customer/provider payment nexus appears to provide strong incentives to take customer concerns seriously, even in the absence of such a board.

* * *

Divesting Washington, D.C.'s Airports: A Model for Comparison

Back in 1985, Dulles International and Washington National Airport (now called Reagan National Airport) were, like the ATC system, an integral part of the FAA. As such, their annual budgets were appropriated by Congress, and the interests of their users were protected by detailed oversight by congressional committees.

Those whose memories and experiences go back 20 years can well remember the obsolete, over-crowded terminal at National and the great under-utilization of Dulles. The airports were starved for capital investment for modernization. Reformers argued that Congress could accomplish the goal of making Dulles and National into customer-friendly airports not by further GAO critiques or tougher oversight hearings but by devolving authority and funding. They pointed to the user-funded models used by hundreds of other airports, in which predictable streams of landing-fee and lease revenues make it possible to issue long-term revenue bonds for modernization, in addition to covering operating costs. They pointed to the natural interest of customers in influencing the kinds of operating and investment decisions that would be made, and the responsiveness of airport management to such customers.

Congress decided to accept these premises, enacting legislation in 1986 to devolve day-to-day control of the airports to a newly created airports authority, removing the airports from the FAA budget and authorizing them to adopt the user-funding model. In the following 18 years, the two airports have been completely transformed. User-charge funding proved to be robust, and the airports were able to issue large-scale bond offerings to finance their terminal and airside expansion projects. The same management and staff were empowered to provide far better facilities and services to their customers. There is probably no one in the D.C. metro area, or in Congress, who would revert back to the old model, under which the airports reported to and received their funding from Congress, as part of the federal budget process.

The message of this policy paper is that air traffic control is analogous in many ways to the Washington airports. The experience of three dozen other countries demonstrates that user-charge funding works: it provides not only operating funds but the means of issuing long-term revenue bonds to finance ATC modernization. Faced with direct accountability to their customers, user-funded ATC providers develop customer-focused corporate cultures, modernize their procurement practices, and increase their productivity. Accountability to their customers takes over from direct accountability to congressional committees.

Congress has before it the opportunity to bring about such a transformation of air traffic control. In doing so, it could cite the strong recommendations of the Mineta Commission, as well as the successful model of the transformation of the D.C. airports. The impending FAA fiscal crisis, along with the sunsetting of existing aviation excise taxes, makes timely congressional action on this issue imperative.

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Related Reason Foundation Studies

Robert W. Poole, Jr., *Corporatized Air Traffic Control*, Reason Foundation Policy Study No. 307, March 2003, http://www.rppi.org/ps307.pdf

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Endnotes

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[3] The low cost carriers are: Southwest, JetBlue, America West, Air Tran, American Trans Air, Frontier and Spirit. As of June of 2004, a new low cost carrier has started up—Independence Air.

[4] Net earnings divided by revenue.

[5] Capital costs in these terms include the opportunity cost of equity capital, which is not itemized on the income statement.

[6] The cost of capital is the *weighted average cost of capital (WACC)* and includes the cost of equity and the after-tax cost of debt.

[7] The "enterprise value" is the market value of equity and debt.

[8] Tangible equity excludes goodwill and other intangible equity on the balance sheet.

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