U.S. AVIATION IN THE 21ST CENTURY

A Vision for American leadership

THE HONORABLE DAVID HINSON, ADMINISTRATOR
FEDERAL AVIATION ADMINISTRATION

AERO CLUB OF WASHINGTON, JANUARY 23, 1996

INTRODUCTION

Thank you, Frank. It feels great to be back!

Once again, I find myself at the top of the batting order as your January meeting speaker. This makes the third year in a row. It reminds me of Casey Stengel's comment, "*This feels like déjà vu all over again.*"

When it comes to championing U.S. aviation, the Aero Club of Washington has been in a league by itself for 87 years. How many clubs can actually pull out a 1909 roster and point to the names Wilbur and Orville Wright?

This country owes a lot to the Wright brothers, and to groups, like the Aero Club, who urged them on. These early visionaries helped establish America's 20th century leadership in aviation during those formative years.

America has dominated aerospace for nearly a century. To retain U.S. aviation's leadership in the 21st century, we need a strong vision -- and an equally strong commitment to carry it out.

I am here to report that this Administration has such a vision. As we approach the second century of powered flight, that vision can be expressed as four propositions:

1.) Our most important value is safety
2.) Our greatest challenge is growth
3.) Our essential tool is technology
4.) Our fundamental strategy is partnership

President Clinton, Vice President Gore and Secretary Peña have made revitalizing American aviation a top priority. They have consistently shown confidence in the FAA's ability to carry out our vital role in this effort — and that has helped us get the job done.

Our Most Important Product

Number 1. *Our most important value is safety.* Let me begin by emphasizing that safety and partnership really can't be separated.

Last January, representatives of government, industry and labor came together for an unprecedented Aviation Safety Summit. Together, we created the first formal nationwide aviation safety partnership.

The U.S. aviation community set the highest possible standard for itself at the Summit: zero accidents.

It's true that we've worked closely together on safety before. That's one of the reasons accident rates today are consistently half what they were a decade ago.

But aviation is already so safe, that from here it's going to take a major effort to make even minor gains.

In response to this challenge, we have refocused the FAA's approach to aviation safety. We are moving away from today's situation where our primary mode of intervention is regulation and surveillance. To reduce an already low accident rate, we need to turn to concepts of risk management and collaborative problem solving.

Our single most important achievement in collaborative problem solving last year was establishing the Aviation Safety Community Data Sharing Group. And I emphasize the word, "our." Without the help of virtually the entire aviation community, this achievement would have been impossible.

The goal of this data sharing effort is to proactively manage risk by studying what happens on normal, safe flights. We collect an enormous amount of data continuously during a normal flight. 200 categories of information on magnetic tape or computer chips at a rate of 64 bits a second.

This new data base, and the partnership behind it, will powerfully support the implementation of Flight Operations Quality Assurance Programs (FOQA) agreed to last January.

The FOQA data that we receive from U.S. carriers will help lead us toward the revolutionary approach to air safety that I mentioned earlier. Combined with information from our own air traffic management facilities, this program will help us put together a comprehensive, real-time picture of normal flight operations.

The results from our domestic system will ready us for the final logical step: a worldwide data sharing network. To do that, we will need to develop a fully-integrated, global safety data base.

One Level of Safety

The other major accomplishment I'd like to mention specifically, is the Commuter Safety Initiative, which establishes "one level of safety" for passengers on scheduled airlines, whether they board a jumbo jet or a ten-seater.

This initiative is the logical outcome of the new standard of zero accidents we have all agreed to support.

The final Commuter Rule that we announced last month is the most comprehensive rule — and the most swiftly enacted — in FAA history.

We listened to what the public and the aviation community had to say after the Notice of Proposed Rulemaking, and the final rule reflects their concerns. We balanced the concerns and interests of small communities, small businesses and the smaller airplanes, while still achieving a higher standard of safety.

TIDAL WAVE OF GROWTH

Number 2. *Our greatest challenge is growth.* When this administration took office three years ago, the issue wasn't growth, it was survival.

Within weeks of his inauguration, President Clinton underlined his concern over massive job losses in aircraft manufacturing by visiting the Boeing plant in Everett, Washington.

A short time later, we urged creation of the Airline Commission to advise us on possible remedies for the crisis. We have already acted on more than 80 percent of the Commission's recommendations.

Today, most of the first-tier players are back on track. Last year, U.S. commercial airlines made $5.3 billion dollars, the best operating profits ever.

Aviation is the crown jewel of U.S. international trade: Boeing is this nation's single largest exporter; U.S. aviation, directly and indirectly, accounts for some 6 percent or more of our total Gross Domestic Product (GDP) of approximately five and one-half trillion dollars.[1]

As a result of your efforts and ours, the outlook for U.S. aviation has never been brighter. Every available indicator points to an era of remarkable growth.

In round numbers, the annual "U.S. aviation economy" of one-third of a trillion dollars today, may rise another $100 billion by 2006.[2]

---

[1] DOT/FAA, "FAA Aviation Forecasts Fiscal Years 1995-2006," March 1995, p. IX-5
[2] Ibid., pp. IX-4-IX-5. 6% of consensus GDP of 7143.8 (2006) is $429 b.

The driving force for the coming boom will be global population growth, combined with a rapidly growing world economy. **[Graph 1]** By 2016, the world's population, expanding at an annual rate of 3.5 percent,[3] will be approximately seven billion.[4]

Economic growth will be even faster, **[Graph 2]** with total world GDP exceeding $50 trillion dollars by 2016.[5]

---

[3] Douglas Aircraft Company, "Outlook for Commercial Aircraft, 1994-2013," July 1995, p. 5
[4] Source: The WEFA Group
[5] Source: The WEFA Group

Growth in passenger traffic is projected to outpace both population and the economy, by expanding by as much as 5.7 percent annually over the next 20 years.[6] During this same period, aviation fuel prices should remain fairly flat in real terms.[7] More people -- a lot more people -- will have a lot more money to fly a lot more places.

---

[6] Douglas Aircraft Company, Op. Cit., p. 5
[7] Ibid., p. 10

Passenger Growth

By 2016, world passenger traffic will certainly double. **[Graph 3]** That would bring us up to a total of *two and one-half billion* air travelers each year.[8] ... more than the entire population of the planet when the Wright brothers lifted off at Kitty Hawk.[9] Regional and commuter traffic will double during this period.[10]

Aircraft

How many planes will it take to carry another billion to a billion and a half passengers? We are easily talking about *twice as many* aircraft by 2016. **[Graph 4]** The world fleet would soar from approximately 9,500 today to more than 18,000 by 2016.[11]

---

[8] Boeing, Op. Cit., . p14, 53
[9] Asimov, Isaac, The March of the Millennia, Walker Publishing Co., 1991, p. 154
[10] FAA, Op Cit.. I-8
[11] Boeing, Op. Cit., p.5 Estimate takes into account expected increases in seating capacity

Taking permanent retirements into account, manufacturers will have to produce 13,000 new aircraft to meet this demand. **[Graph 5]** We are talking about an expected dollar value well in excess of *one trillion dollars*.[12]

We're looking at the roll-out of two new jet liners a day, every day, between now and the year 2013. The lion's share will be built by American manufacturers.

Regional and commuter aircraft are also likely to be upgraded significantly over the next few years. We expect average seating on the regional fleet to rise from about 24 seats, as of 1994, to nearly 35 seats just ten years from now.[13]

---

[12] Ibid., p.5
[13] FAA, Op. Cit.,p. I-8

Air Cargo

Industry analysts are also forecasting spectacular growth for the air cargo industry over the next 20 years. Volume is predicted to rise to *four times* the current level, requiring more than double the present number of transports.[14]

If history is any guide, all of these statistics may significantly understate the reality.

Back in 1927, Fortune magazine asked a panel of leading scientists to predict the future of air travel. Their conclusion?

---

[14] Boeing, Op. Cit., p. 47, 49. Adjusts for larger size of future transports. Most will be passenger conversions rather than new aircraft

"Aeroplanes capable of carrying up to 50 passengers at a speed in excess of 300 miles per hour will routinely cross the Atlantic before the end of the 20th century."[15]

This was a pretty outrageous prediction for 1927. At the time, only one plane carrying only one pilot -- and no passengers -- had successfully flown from North America to Europe.

Even so, these distinguished forecasters fell way short of the mark. By century's end, aircraft will routinely carry *500* passengers non-stop across the oceans at *600* miles an hour.

---

[15] Fortune, 1927 (full citation pending)

TECHNOLOGY

Number 3. *Our key tool is state-of-the art technology.* We expect more technological advances in the next 20 years than in the last 100. Out of the many technologies and integrated technological systems under development, I would like to emphasize three which I believe to be particularly significant:

1.)Seamless Global Air Traffic Control
2.)Satellite Navigation
3.) Automatic Dependent Surveillance

Seamless Global System

The Air Traffic Control System of the future will not only be state-of-art, it will be a seamless global system. This means more than just code sharing or new alliances between U.S. and foreign flag carriers. Everywhere in the world, aviation must increasingly conform to a single set of international standards and procedures.

The integrated system of the future will be based on compatible and interchangeable components. To help define the parameters of such a system, the FAA is working closely with the International Civil Aviation Organization (ICAO) and its recently created Future Air Navigation Committee.

Satellite Navigation

Satellite navigation is the centerpiece of tomorrow's global system.

In 1994, we certified the Global Positioning System (GPS) for civil navigation. It is presently approved for primary navigation over the ocean, supplemental navigation en-route and for non-precision approaches.

A Wide-Area Augmented System (WAAS), which will allow pilots to use GPS for precision approaches to airports, is in the works for the late '90s.

The committee originally estimated that the full benefits of GPS technology as part of an integrated system would not begin to be realized until 2010. We've beaten that timetable by 15 years.

The third vital technology is Automatic Dependent Surveillance, or ADS. Here's how it works.

Later in this decade, ADS will let an aircraft's computers automatically report its position, programmed flight path and weather conditions to ground controllers. On transoceanic routes, the system will send these reports via satellite.

The system also can be programmed to report deviations from the intended flight path. For example, the aircraft computers might be ordered to notify ATC if the aircraft strays more than 10 miles off course.

We expect ADS to let us reduce separation on international flights. And all of these systems, by the way, hold the promise of significant savings in fuel costs and time lost for the airlines.

PARTNERSHIP

Number 4. *Our fundamental strategy is partnership.* The tremendous progress the Aviation community is making in safety, proves we know how to work together. It provides a wonderful model for possible cooperation in other areas.

But as your partner, I have to confess to you that the FAA faces some serious financial barriers to holding up our end of the partnership.

The FAA's annual budget has already been cut by $600 million since 1993. As the budget process now stands, we may be cut another 14 percent below 1995 levels by the year 2002. We are being asked to do a lot more with a lot less.

If current inflation projections are accurate, the cost of present services will double over the next 20 years. There are no dedicated revenues in the pipeline to cover the expected shortfall.

It's time to ask a fundamental question: Can we afford to continue funding FAA operations on a "business as usual" basis?

Last year the Congress passed, and President Clinton signed into law, an appropriations bill which took some important steps toward streamlining the FAA. The bill gave us much-needed personnel and procurement reforms that will help us reshape the way the FAA serves the aviation community.

But the final bill did not include our most pressing need: finance reform. The McCain/Ford/Hollings bill, now pending before the Congress, would remedy this oversight. It would provide the FAA with predictable revenue which would automatically grow along with our increasing workload.

In addition to providing the FAA with the revenue stream it needs to function effectively, this proposal would, in time:

- Free us from an archaic, unpredictable budget process

- Promote efficiency and accountability

But the bottom line is that the industry would benefit. We want a more secure funding base so that we can provide the first-class services needed to keep aviation growing.

Putting the FAA's budget on a fair-share basis will help ensure that budgetary politics doesn't strangle U.S. aviation's growth potential.

We believe that the McCain bill currently offers the best approach to long-term financing. There are other proposals, and there will still be debate on the best course of action.

We are asking you to be an intelligent participant in the coming debate. I assure you that President Clinton, Transportation Secretary Peña, and I -- are committed to having this debate.

We have no reservations about defending the FAA's need for secure funding. The final outcome of this debate, whatever legislative form it ultimately takes, should be a true public-private partnership between the FAA and those who rely on the FAA's services.

CONCLUSION

Here's where we are.

The aircraft industry, driven by demographics, market economies and open markets — "globalization — is entering what will perhaps be its greatest growth period.

The General Aviation and business aircraft industry is beginning a recovery that will be permanent and long-lasting.

Technology, affordable and usable, is proliferating.

Talking Points
AVR "Administrator's Forum"
January 25, 1996

1) Welcome to participants

- Your job is one of FAA's most important. Because it is so important, the Administrator needs to hear first-hand how things are going, how we can help you do your jobs better.

- We know you have a tough job. Here in Washington, we carefully crafted this sweeping safety initiative. Now, you have to go out and enforce what we've created. I know you can do it — to everyone's benefit.

2)We can look back on a year of remarkable achievements

- Safety Summit a year ago agreed on Zero Accidents goal; follow-up in December.

- Crafting the Commuter Rule in record time for such a comprehensive regulation, and publishing it when we said we would.

- Safety audit of carriers.

3)Can't overstate the importance of Commuter and Operator Training Rules, plus NPRM on Flight Duty Limitations, on goal of Zero Accidents.

- Commuters are fast-growing segment of industry; regional/commuter traffic expected to double in next 20 years.

- Rules balance the interests of small communities and smaller businesses without sacrificing the higher safety standard.

- New safety approach essential; cite Boeing hull loss projections if same accident rate persisted. We have already done the "easy" things in aviation safety.

- There will be a direct cause-and-effect relationship between your work and this higher safety standard. You are key people in achieving Zero Accidents.

4) Throughout the process, our strategy has been that we can't regulate our way to Zero Accidents; we must cooperate our way to that goal.

- Shared responsibility.

- Partnership — involving all parts of the aviation community in the safety effort gives everyone a stake in the outcome.

- This will take a solid commitment from all involved.

- Real question about our ability to be full partners unless we get long-term FAA financing reform.

5) Budget & reform update

- FY96 budget is good news/bad news situation. We got what we wanted in some areas, less than what we needed in others.

- FY96 appropriation gives us unprecedented opportunity to reinvent FAA personnel and procurement systems. We have 200+ people working to develop concepts by April 1. FAA is the envy of every other government agency.

- We believe financing reform of some type will be enacted — question is when...and how do we manage in the meantime?

6) The broader vision; recap some Aero Club themes:

- Safety is "Job 1." Inspectors are in the front lines of that effort.

- Our greatest challenge is how to handle a "tidal wave" of growth in aviation when we know our resources will diminish.

- Affordable and usable technology is our key tool in handling this growth.

- Partnership is and will remain the foundation of our progress toward all our goals.

7) Conclusion

- These are challenging times. The FAA — as well as the whole government — is being asked to do more with less.

- We actually are in a better position than many others. All you have to do is read or listen to the news: some agencies may no longer exist when budget battles are over.

- Not so with aviation safety. We here in Washington have been fighting to increase, not decrease, inspection capabilities and workforce.

8)Bottom line as we go to Q&A: Tell us the straight story on what you need to do this critical job of implementing the new commuter safety regulations. We'll see that you get it.

Talking Points
AVR "Administrator's Forum"
January 25, 1996

1) Welcome to participants

- Your job is one of FAA's most important. Because it <u>is</u> so important, the Administrator needs to hear first-hand how things are going, how we can help you do your jobs better.

- We know you have a tough job. Here in Washington, we carefully crafted this sweeping safety initiative. Now, you have to go out and enforce what we've created. I know you can do it — to <u>everyone's</u> benefit.

2)We can look back on a year of remarkable achievements

- Safety Summit a year ago agreed on Zero Accidents goal; follow-up in December.

- Crafting the Commuter Rule in record time for such a comprehensive regulation, and publishing it when we said we would.

- Safety audit of carriers.

3)Can't overstate the importance of Commuter and Operator Training Rules, plus NPRM on Flight Duty Limitations, on goal of Zero Accidents.

- Commuters are fast-growing segment of industry; regional/commuter traffic expected to double in next 20 years.

- Rules balance the interests of small communities and smaller businesses without sacrificing the higher safety standard.

- New safety approach essential; cite Boeing hull loss projections if same accident rate persisted. We have already done the "easy" things in aviation safety.

- There will be a direct cause-and-effect relationship between your work and this higher safety standard. You are key people in achieving Zero Accidents.

4) Throughout the process, our strategy has been that we can't regulate our way to Zero Accidents; we must cooperate our way to that goal.

- Shared responsibility.

- Partnership — involving all parts of the aviation community in the safety effort gives everyone a stake in the outcome.

- This will take a solid commitment from all involved.

- Real question about our ability to be full partners unless we get long-term FAA financing reform.

5) Budget & reform update

- FY96 budget is good news/bad news situation. We got what we wanted in some areas, less than what we needed in others.

- FY96 appropriation gives us unprecedented opportunity to reinvent FAA personnel and procurement systems. We have 200+ people working to develop concepts by April 1. FAA is the envy of every other government agency.

- We believe financing reform of some type will be enacted — question is when...and how do we manage in the meantime?

6) The broader vision; recap some Aero Club themes:

- Safety is "Job 1." Inspectors are in the front lines of that effort.

- Our greatest challenge is how to handle a "tidal wave" of growth in aviation when we know our resources will diminish.

- Affordable and usable technology is our key tool in handling this growth.

- Partnership is and will remain the foundation of our progress toward all our goals.

7) Conclusion

- These are challenging times. The FAA — as well as the whole government — is being asked to do more with less.

- We actually are in a better position than many others. All you have to do is read or listen to the news: some agencies may no longer exist when budget battles are over.

- Not so with aviation safety. We here in Washington have been fighting to increase, not decrease, inspection capabilities and workforce.

8)Bottom line as we go to Q&A: Tell us the straight story on what you need to do this critical job of implementing the new commuter safety regulations. We'll see that you get it.

Remarks Prepared for David Hinson
Administrator, Federal Aviation Administration
Lehman Brothers Transportation Conference
Palm Beach, Florida
January 31, 1996

INTRODUCTION

When the closing bell sounded on Wall Street on December 31st, rising prices for airline stocks reflected rising expectations for the industry. Credit for this turnaround can be widely shared ... by management willing to do what had to be done to restore profitability, by unions agreeing to make the necessary concessions, and by the Federal Government for pursuing the right policies at the right time. An industry capable of such a rebound, from staggering losses and bankruptcy to record-breaking profits, proves that it is still one of the most promising in the entire American economy.

Some prominent investors may believe that no airline is going to be a wonderful business, but judging from all the startups, it's clear that many disagree. Aviation still draws some of the best and the brightest of our nation's entrepreneurial talent. And several of the most impressive success stories in American business during the past few years have been aviation stories. As an industry, we're as innovative as telecommunications, computers, and biotechnology.

The success of Southwest Airlines has inspired imitators around the world. And even long-established carriers are staking their futures on some fairly unorthodox ideas. United's experiment with employee-ownership is not what you'd expect from a mature market leader.

Government has been a catalyst for productive change as well -- through deregulation at home ... through open skies agreements with other countries ... by shifting to a space-based system of air traffic management ... and by acting decisively to eliminate the few remaining hazards to air travel. For as we all know, aviation safety is the one essential precondition for industry vitality.

It is hard to find a sector of our economy that has been more affected by the robust forces which are shaping the next century: global competition, deregulated markets, and the advances in information technology.

It's a wonderful time to be in the aviation business. And it's an exciting subject to talk about.

This evening I'm going to cover three points.

First, I will review the reasons why I, along with many others inside the business, expect aviation to be a growth industry in the years ahead.

Second, I will point out the underlying assumptions in these forecasts which may be open to serious question.

Then, for my third and final point, I will suggest some changes that must be made in the FAA, if we are to take advantage of the opportunity for growth in the years ahead.

AVIATION IS A GROWTH INDUSTRY

My optimism about aviation is based, in part, on predictions for the global economy. We look to aviation statistics to give us an early indication of more general economic trends. One of these is the accelerating growth in world income.

I'd like you to compare two graphs.

[Graph 1: World Population Growth]

This one shows the projected growth in world population over the next quarter century. We see a steady increase, reaching an estimated eight billion people by the year 2021, more than two billion more than are living today. Compare the relatively steep climb shown in this graph with the one I'm going to show you now -- which is even steeper.

[Graph 2: Worldwide Income]

This plots the growth in aggregate world income, starting in 1980 and projected out to the year 2016. You can see that beginning about now, the rate of growth is expected to accelerate, with total income doubling over the next twenty years. The implication is extremely important: wealth will be growing faster than population for the next two decades. Especially in Asia, where new centers of economic power are emerging.

[Graph 3: Top Ten Countries in Market Size]

By the turn of the century ... just four years from now ... four of the top ten markets will be on the other side of the world from us. And these markets are increasingly open to global competition.

Today 112 nations are members of the World Trade Organization, which requires -- as a condition of membership -- a formal commitment to free trade. The advantages of WTO membership are so significant that there is a waiting list of 27 nations which have made application to join.

The countries in the queue include China, Russia, Saudi Arabia, Taiwan, and Vietnam ... all important customers for aircraft manufacturers. Stable and more liberal trade regimes would make these potentially lucrative markets even more attractive.[1]

With expanding world trade and rising incomes, air transport will also increase...creating an unprecedented demand for new aircraft.

All the long term indicators point up.

[Graph 4: World Passenger Traffic: Billions of Revenue Passenger Kilometers, 1993 - 2016]

Air travel is expected to more than double over the next 20 years, with an average annual growth rate of 5.7 percent. By the end of the period for which we're forecasting, airlines around the world will be carrying two and a half billion passengers each year. Air cargo will also grow, averaging 6.6 percent a year over the next two decades.[2]

[Graph 5: Growth in Passenger Traffic, 1991-1995]

Domestic air travel will participate in this growth, but at a somewhat slower pace than in the past. During the first half of this decade, the U.S. market was restructured as the major carriers stabilized, or reduced, capacity; the commuters found new opportunities for expansion; and international routes attracted more and more passengers.

[Graph 6: Growth in Passenger Traffic, 1995-1998]

Over the next three years, the FAA is forecasting a growth rate of 5.7 percent for international travel and 4.9 percent for domestic.

[Graph 7: Major Airlines - Domestic Operations; Change in RPM, Revenue, and Yield]

Another consequence of the restructuring within the airlines is a return to profitability. A year ago this month, the decline in yields seemed to bottom out. By April, yields were growing and continued to build through the summer and early fall. Even though fare hikes contributed to a drop in revenue passenger miles ... total revenue was not adversely affected.

---

[1] The Economist, January 13, 1996, page 72.

[2] "Boeing foresees air cargo growth, end to long-term profit slide," Journal of Commerce, September 7, 1995

Perhaps a degree of economic order and earnings predictability has at last returned to the U.S. market. But elsewhere, we may expect the volatility that comes with rapid growth.

[Graph 8: Population and Airline Traffic: United States and China 1995]

Much of that growth will occur in Asia. In China and India today, the average number of annual air trips per person is about one percent of the corresponding number in the United States. But air travel in China will be growing by an average annual rate of more than 10 percent, twice the rate worldwide.[3]

[Graph 9: Jet Aircraft Deliveries]

To handle this heavy volume of passengers and cargo, airlines will have to double the size of the existing fleet, buying 15 to 17 thousand new planes by the end of 2016. As many as 10 thousand of these new planes will be needed just to meet future growth.[4]. Here we see that aircraft deliveries are expected to double by the year 2002 or 2003, then double again within 20 years.

[Graph 10: Dollar Value of Jet Aircraft Deliveries].

The aircraft manufacturers are at the threshold of a long, sustained period of increasing sales. In dollar terms, the cumulative value of these aircraft deliveries will far exceed a trillion dollars. Even the long-dormant general aviation sector is showing signs of growth. Deliveries last year topped the 1,000 mark ... the highest since 1990. Dollar volume was up more than 20 percent ... from $2.4 billion to $2.8 billion ... the best its been since 1981.[5]

One industry forecast for general aviation predicts a 5.5 percent annual increase in sales for the coming decade.[6]

---

[3]"Carriers to spend $1,000 billion on aircraft in next 20 years, "The Financial Times, March 22, 1995.

[4]"Boeing predicts gradual recovery for aircraft orders," Journal of Commerce, June 8, 1995; and "McDonnell Says airlines will need 13,300 jets, "Wall Street Journal, June 9, 1995. It predicts an offsetting retirement of 4,800 airliners. Boeing's forecast calls for 15,400 new jets, retiring 5,400. Prudential forecasts a tripling of today's fleet, to about 12,500 by 2008 (Aviation Daily), March 28, 1995)

[5]"Market Review and Outlook" by Edward W. Stimpson, president, General Aviation Manufacturers Association, January 25, 1996.

[6]From Allied Signal's annual forecast for general aviation aircraft sales, Journal of Commerce, September 27, 1995.

With projections like these, it is easy to understand the enthusiasm of the industry analyst who spoke of the coming "age of nirvana for aircraft production."[7]

FORECAST ASSUMPTIONS

This brings me to my second point. ***Forecasts are not self-fulfilling prophecies.*** While there are solid grounds for optimism, there is a basis for concern as well. The forecasts I've been citing all assume that both industry and government will have the resources to handle the expected growth. It is assumed that the airlines will be able to finance new plane purchases and that airports can add capacity to keep pace with demand. It is assumed that the FAA will find the money to upgrade its air traffic control technology and continue to provide its essential services. If we fail to fulfill any one of these assumptions, we may forfeit the gains which are forecast.

In the investment world, forecasts are the basis for action. They justify decisions to invest or to liquidate positions. But forecasts can also provide a plan of action. They can help us identify what must happen if the forecasts are to be realized. They give us some insight into what we must do to make the forecasts come true.

Forecasts are about limits -- the factors which impose a ceiling on our hopes and lay a foundation for our worst fears. The challenge is to know what those limits really are and to overcome them.

In the early days of aviation, engineers saw themselves constrained by what they believed to be the limits of their science. One of the constraints was a mathematical equation which stated that the power needed to achieve a certain speed increases as the third power of that speed. This formula was found in all the engineering textbooks of the 1920s. And nobody questioned it. It was, they believed, a law of nature.

It meant that if a 400 horsepower engine could produce a speed of 100 miles per hour...then to double that speed -- boosting it to 200 miles per hour -- would require 3,200 horsepower. Sixty or seventy years ago, that kind of speed seemed about as improbable as today's science fiction about spaceships cruising at "warp speed." In the 1920's, no one could anticipate the rapid progress to come ... and not because they lacked imagination.

---

[7]Gary Reich of Prudential Securities, quoted in Aviation Daily, March 28, 1995.

The novelist Nevil Shute -- author of *On the Beach* -- worked, for a time, on one of England's large dirigibles. His job was "chief calculator", and he was very much aware of the physical constraints in aviation design. In 1929, he wrote that the airplane would eventually reach its upper limit of development around the year 1980. And that this ultimate airplane would have top speeds of 110 to 130 miles per hour, a range of 600 miles, and have a total weight of 20 tons.[8]

Lack of vision is one common failing in trying to anticipate the future. But there is also a risk in being too visionary. David Sarnoff, writing in the 1950's, had no doubt that by 1980, airplanes would be powered by atomic batteries.[9]

We need to have a clear sense of the limits which constrain what we can do.

The principal constraint on aviation is, of course, the state of the overall economy. A growing economy makes almost every problem more manageable. An economic slump makes every problem more difficult to solve. The current optimism of our aviation forecasts reflects an underlying optimism about our nation's long-term economic prospects.

Bullish economic projections foresee a 15-year period when our productivity gains and demographic trends almost guarantee a low-inflation environment. The surge in productivity may rival that of a century ago, when electrification transformed our way of life.[10]

These favorable economic trends have been reinforced by the policies of the President. The "revolution" in Washington did not begin with the last Congressional elections. It began with the election of President Clinton. For it is this Administration which has reduced the deficit for three years in a row. We haven't seen that kind of fiscal discipline since Harry Truman's day.

We have seen the deficit fall to 1.4 percent of the gross domestic product -- about half of what is was at the beginning of the President's term. The President can also be credited for reducing the size of the federal government by 200 thousand people. And, I might add, 5,000 of those were employees of the FAA. This is the smallest the federal workforce has been in 30 years. And as a percentage of the civilian work force, the smallest it has been since 1933.

---

[8]T.A. Heppenheimer, Turbulent Skies; The History of Commercial Aviation. Wiley, 1995, page 17. See also the discussion of the Liberty engine by Bill Siuru and John D. Busick, Future Flight: The Next Generation of Aircraft Technology, (McGraw-Hill, 1994, pages 59 and 60).

[9]Rose DeWolf, "Yesterday's Tomorrow," New York Times Magazine, December 24, 1995, page 46.

[10]Don R. Hayes, Director of Investment Strategy, Wheat First Butcher Singer, writing in Investor's Spectrum, January 1996.

These figures point to a major reversal of historic proportions. Certainly, none of us in this room tonight have seen -- in our lifetimes -- such a determined and successful effort to shrink the size of the federal government.

This austerity contributes to the current environment of low inflation. During the President's term, it has averaged just 2.7 percent annually -- the lowest it has been since John F. Kennedy was in the White House. The rate at the end of 1995 was even lower -- about 2.5 percent. And for 1996, quite a few economists see inflation dropping to two percent or even less.[11]

Low levels of inflation, coupled with the lowering of interest rates which many expect this year, will be especially beneficial to aviation. The costs of new aircraft and the cost of financing their purchase, can be kept low. This sets the stage for the vigorous growth we expect for the industry. As one trade association executive puts it: "The U.S. economy has created a positive climate for aircraft sales."[12]

And the effects will spread throughout the entire U.S. economy. Today, aviation -- and its value added components -- contribute about six percent to our gross domestic product. In the aggregate, aviation supports more than 8 million jobs, earns more than 200 billion dollars annually, and generates about 700 billion dollars of economic activity. And aviation contributes strongly to the export side of our balance of trade. Boeing is our largest single exporter, and travel and tourism generates more than a 20 billion dollar trade surplus each year.[13]

All of this growth means that there will be many more planes in the air. Here in the United States, we must expect between three and four thousand additional aircraft in our busy airspace and at our already crowded airports.

Passenger delays due to congestion increased about five percent a year in the 1990s. According to one market survey, the typical air traveler in the U.S. now spends an average "dwell time" of 59 minutes in airport terminals due to flight delays, the usual connection problems, and scheduled layover time.[14]

---

[11]Bernard Wysocki, Jr., "The Outlook: Few Economists Expect Deflation in the U.S.," Wall Street Journal, January 15, 1996.

[12]Edward W. Stimpson, in "Market Review and Outlook," General Aviation Manufacturers Association, January 25, 1996.

[13]"The Economic Impact of Civil Aviation on the U.S. Economy," Wilbur Smith Associates, April 1993.

[14]Source: Air Marketing Services, quoted in The Wall Street Journal, June 1, 1995.

Delays are, of course, more than just an inconvenience. They are a heavy economic burden both on the industry and on the traveling public. After safety, one of the highest priorities at the FAA has been to find a way to cut delays while, simultaneously, handling an ever growing volume of traffic. The solution, we found, was not to add on to the existing system, but to radically redesign it.

We are fortunate that at this point in aviation history ... when a totally new approach to air traffic control is becoming an urgent necessity ... most of the necessary technologies are already here, or on the way. One is the Global Positioning System, which our Government has nurtured to the point where it is a de facto international utility, creating a market that is doubling every two years. Another critical technology is digital data link for fast, error-free communications between the cockpit and the ground. A third "just-in-time" technology is advanced automation, which we are continuing to introduce into our air traffic management system.

The fact that these three technologies were emerging when we needed them was fortuitous. We were able, for example, to take advantage of years of DoD-sponsored research which led to the development of GPS. But what today is a technological marvel, tomorrow is merely mundane. Technology will move on just as certainly as it will become more costly.

The troubling question before us is will the FAA be able to keep up with each successive advance in high technology?

My third and final point concerns this question.

THE NEED FOR FAA REFORM

Aviation has a unique relationship to government ... a relationship dating back to the very beginnings of our industry. The National Airline Commission defined it like this: "The airlines are the only commercial industry whose minute-by-minute operating efficiency is capped by the operating efficiency of the Federal Government".

Aviation can grow only if the infrastructure is in place to accommodate that growth. And, historically, much of the expansion of capacity has been publically funded. We now face the almost certain prospect that public funding will fall short of what we need. The result could significantly constrain the future growth of the industry ... and eventually have a depressing effect on the entire economy.

No one who has looked seriously at our situation believes that the present way we finance the acquisition of new technology is adequate. It doesn't work well now, and it is going to become even more of a handicap in the years immediately ahead.

The President faced up to the difficulty and initiated a broad examination of our options -- starting with the President's Airline Commission, and continuing with proposed legislation for reforming the FAA.

Congress has also taken up the issue, and last year acted to give the FAA greater flexibility in personnel and acquisition policies. This is an opportunity for constructive change, and we are working to take full advantage of it. By April, we will know in detail how we plan to put these changes into practice. And they will help. But this is only a partial solution. The financing issue -- which is the most critical -- remains thus far unresolved. A clear consensus within the industry itself has yet to emerge.

What is clear is that the financing mechanisms available to the FAA are institutional relics from earlier, simpler times ... unable to keep pace with the investment requirements of high tech industry. Our very structure is an impediment when it comes to raising funds for long-term projects -- especially in a time when the federal budget is under severe pressure.

Among the many proposals being considered are some which would allow the FAA to tap the capital markets. Governor Gerald Baliles, who chaired the President's Airline Commission, had this in mind when he proposed the creation of an Air Traffic Control Authority within the FAA with the power to issue bonds to finance capital improvements.[15]

It is also what President Clinton hoped for when he proposed the Air Traffic Services Corporation two years ago. Now the bipartisan reform bill introduced by Senators McCain, Ford, and Hollings comes the closest, I believe, to giving us the reforms we need.

CONCLUSION

There is an important role which the private sector can and should play in this debate. The objective is to create a mechanism which would encourage the inflow of private capital to supplement the dwindling resources of the federal government. But neither private investors nor the federal government can shoulder the entire responsibility. We must find a balanced formula.

The European experience with Eurotunnel has shown that while global capital markets were large enough to build the tunnel, the need for a quick return on investment meant that the economics didn't work out once operations had begun.

---

[15]Letter to Editor, Journal of Commerce, September 20, 1995.

The long history of monumental projects -- dating from the Suez and Panama Canals, and extending to our more recent experience with new airports -- teaches us that they tend to come in over budget and short of projected revenue, at least for the early years. There are limits to what we can reasonably expect of the market. Projects of this magnitude require some degree of public partnership as well.[16]

Today, building new airports and developing modern air traffic control systems are ambitious engineering feats. They require decades to plan, and enormous sums to finance. My concern is that projects on this scale may not be feasible in the future -- unless we succeed in finding a rational way to pool public and private resources.

At this point, no one can claim to know the right formula for mixing the two. The new rail link between the Chunnel and London is one attempt at an answer.[17] But this is a largely untested, untried concept.

As I said at the outset, aviation has never lacked for innovation. But new ideas in aircraft design or airline marketing strategy are no longer sufficient -- in themselves -- to assure continued growth of the industry. We must have the same quality of innovative thinking about how to underwrite essential infrastructure.

For this, we must look to the investment community. My hope is that in this room tonight, there are ideas just as promising as our forecasts.

Thank you.

---

[16] "Chunnel investors did not heed history; backers of Eurotunnel could lose their shirts," Wall Street Journal, May 26, 1995.

[17] "Eurotunnel and the banks," The Economist, January 20, 1996.