Draft Remarks for Monte Belger before Washington Chapter of Black Coalition of FAA Employees
June 8, 1993

It's a pleasure to be with you this morning. Thanks for inviting me.

I like the theme of your conference--"focus on the future." That's where we all need focus our energies--on the future, preparing ourselves to meet the challenges that lie ahead.

Many people spend too much time worrying about the past. Somebody once said that's like sitting in a rocking chair, rocking back and forth. It gives you something to do but it doesn't get you anywhere.

I also like what I see in terms of the workshops you are offering. I think you are on the right track. What I like about these sessions is that they seem to be oriented toward taking control of your own destinies and not waiting around for good things to happen to you.

What you are doing with this training is an important part of what the agency should be doing to prepare for the technical challenge facing us. Too often, we think of this technical challenge only in terms of procuring the right mix of equipment, facilities and technologies. These are the items that seem to get all the visibility, all the publicity, and frankly all the money. Just as daunting a task, though, in my judgment, is getting the right people to manage and operate these technical systems. And that's primarily a matter of recruiting and training that needs to take place--not in the year 2000, but starting right now.

You will never see a headline accusing the FAA of being late and behind the power-curve in terms of hiring and recruiting for the future. But, it's common to see a headline like that whenever a program slips behind schedule. I am not suggesting we are looking for more adverse headlines, but I am suggesting

that we all need to regard recruitment and hiring of the work force as a vital part of our preparations for the future. And at the moment, I don't think we do. And I submit that the Black Coalition--the Washington chapter as well as the National Coalition--can play a greater role in helping the agency focus its attention on this need. That is the challenge I offer you today which I will expand on in just a minute.

As you can see, I didn't come down here today to tell you how much we have done over the past x number of months. I know it's traditional to do that and it's not without a certain value. But, my problem with this approach is that it tends to reduce this whole effort to a score card--inducing complacency in some and perhaps false expectations in others.

What concerns me most of all is that this approach tends to promote divisiveness by creating an "we versus them" environment. "What have *you* done for *us*" becomes the rallying cry instead of what have we all done, pulling together, to move this thing forward.

It's not that I don't believe management bears a special responsibility to lead the way in helping create a more diverse work force. It clearly does. But, I also don't believe that diversity is a program that management is solely responsible for, that Human Resource Management is solely responsible for, or that Civil Rights is responsible for. I think it is something we are all responsible for.

Nobody should be off the hook and be able to say, that's not my job. It's everyone's job--and more than than a job. It's got to be a way of life, a mode of thinking. And until we get to that point, I don't think we should be satisfied, no matter how many boxes we have checked off, no matter what progress we might have made in a particular area.

However, if you will allow me a moment of reflection on the past, I must say that significant progress has been made over the last few years in making some

of the institutional changes needed to make workforce diversity happen. To cite just one example, SESers now have to show that they have taken positive, concrete steps to ensure that minorities and women within their organizations are developed and prepared for management and executive positions. It's one of their critical job elements.

At the same time, it would be dishonest to say that we have come a long way. We haven't. We've barely begun. For example, the numbers over the past four or five years show a significant percentage growth in the number of African Americans at FAA. However, most of that increase is at the lower levels. But, we haven't done nearly well enough in hiring and promoting Blacks, women and other minorities into higher-level management positions, including the SES ranks. So, we can't take much comfort in raw numbers.

Yet, I still believe the right climate is there, as there has been for the past four or five years, to make significant progress. I think most would agreee that the commitment of Jim Busey and Barry Harris to workforce diversity was unequivocal. And I think the extraordinary efforts the Clinton Administration is making to ensure diversity in its appointments shows where the President stands on this issue.

When Dr. Paula Bagasao, from the White House personnel office, was here at FAA for an Asian/Pacific American Heritage ceremony a few weeks ago, she indicated that only about one-fourth of the appointments had been made to date. The reason for this is that the President was insisting there must be diversity in the list of candidates submitted for his review or the list would be returned until there is.

So, as much grumbling as there has been about the slowness of the Administration in making its appointments, I think they are making a good-faith effort to put in place an Administration that looks like America.

I think Secretary Pena is a perfect example of a Clinton appointment who is committed to diversity. If you heard the Secretary's deputy chief of staff, Katherine Archuleta, when she was here at FAA recently, you'll know what I am talking about. I also urge you to read the Secretary's recently-issued policy statements on workforce diversity, civil rights and sexual harrassment.

Over the years, I have seen these policy statements issued by the various Secretaries and, frankly, some of them appeared pretty perfunctory, giving the impression that the previous one were merely dusted off, retyped and reissued. But, there's a freshness in the Pena policy statements that strongly suggest personal commitment. And, I can tell you from our dealings with the Secretary's office that this is indeed a fact, as I feel confident we will all see more clearly in the months ahead.

My purpose in all this is to make the point once again that the climate is favorable and it's now up to us to figure out how to take advantage of these conditions in our part of the world--here at the FAA.

In other words, what can we all do to take this up a notch or two? Not what can this administration can do, what Secretary Pena can do, or what the new Administrator can do. The question should be--what can we do? What can I do? More specific to today's audience, what can this coalition do?

Let's go back for a moment to issue of women and minority representation in the SES rank at FAA. Of the latest crop of candidates to make it through the CDP process, 27 percent are women and 20 percent are minorities. Compared to the percentages of minorities and women who made it successfully through the CDP process earlier, this doesn't look too bad. But, from the perspective of the existing pool of SESes at FAA, it's a drop in the bucket. Of the 173 SES positions currently filled in the FAA, only 11 percent are minority and 9.6 percent are women. That's not nearly good enough and we all know that.

I don't like the numbers game. But, as I have told my children, grades may not be everything, but they are one strong indicator of how they are doing and we can't ignore them. That's the way I feel about the numbers of women and minorities in the higher echelons of the FAA. Something isn't quite right and we've got to figure out why we aren't doing better in this regard.

Now, I am sure everyone has a theory, but I don't think it is particularly helpful to begin pointing the finger--unless it is at ourselves. I think we need to focus, as you are doing with this conference, on the future and think in terms of what we can do better down the road.

I don't have a lot of pat answers but I do have some questions that we need to ask ourselves. As far as the coalition goes--this particular chapter of the coalition--I think it should be reassessing its mandate and role. It should be asking itself: what can we as a group do to become more effective?

And, while you're in the process of addressing that question, let me suggest that you don't need to think necessarily about doing *more* but about doing *better*. Sometimes, here in Washington, we do an enormous amount of work, individually and as an agency, but we don't necessarily work effectively. We don't always work smart.

So, I would suggest what what you need to do is pick off a few major agenda items where you think you can do the most good and devote your resources and energies to accomplishing them over the next year.

One area where I can see coalition involvement is in identifying candidates

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REMARKS BY JOSEPH M. DEL BALZO
ACTING ADMINISTRATOR, FAA
PRESS BRIEFING: "FAA APPROVES USE OF GPS FOR
NON-PRECISION AIRPORT APPROACH NAVIGATION
JUNE 9, 1993
WASHINGTON, D.C.

1. THE ANNOUNCEMENT:

A. Two years ago a satellite-based navigation system for civil aviation was only a concept. Today, we are announcing an important step toward making this concept a reality.

B. Beginning today, the FAA has approved the supplemental use of the Global Positioning System navigation system for all phases of flight, down to non-precision approaches to airports. (Transport Canada will shortly make a similar announcement.)

C. This is a significant milestone for the FAA and for aviation. For the first time in history we're going to have one basic system that could handle all phases of flight: oceanic, en route, terminal area, and non-precision approach. Whether GPS can provide Category II/III landing capability has yet to be determined.

D. The approval we are announcing today includes authorization to use GPS to fly existing VOR, NDB, and RNAV approaches.

1) Instrument approach overlay procedures have been completed that will allow aircraft equipped with approved GPS receivers to use them at over 5,000 published non-precision approaches at 2,500 airports in the United States.

2) With GPS, virtually every airport in the world can become an "instrument approach".

3) Testing began in July of last year. Transport Canada provided a commercial aircraft and flight crew; AOPA provided its Bonanza aircraft and crew for general aviation.

The results show that GPS provided better guidance than VOR and NDB.

4) Certification criteria for GPS receivers issued last December. Units will be available for purchase this Fall.

5) GPS constellation will become operational in this Fall, when all 24 satellites are functioning in their assigned orbits.

FACT: FAA IS READY TO IMPLEMENT BEFORE THE EQUIPMENT IS AVAILABLE.

II. NEXT STEPS:

A. Future milestones include feasibility demonstration of GPS to support Category III precision approaches (1995) and development of a wide area differential network planned for Category I precision approaches (1998).

III. BENEFITS TO U.S. AVIATION:

A. GPS combined with advanced telecommunications and higher levels of automation offers virtually unlimited opportunities for improvements in aviation safety, capacity, and efficiency.

In the En Route Environment - GPS provides navigation capabilities never before possible. These include:

1) Instantaneous position reports and updates that will give us major capacity increases, particularly in remote areas and over oceans.

2) Flexible, direct routings for fuel and time savings

3) High quality navigation services without investing in expensive ground facilities. We may no longer need to replace aging primary radar, or to buy, install, and maintain VORs and Category I instrument landing systems. (Fact: A category I ILS (full system) costs approximately $1.7 million.

The U.S. operates and maintains 200 older Cat I systems that are nearing the end of their life cycle. The U.S. also owns 1,000 VORs and 658 NDB's which cost $34 million dollars a year to maintain. To replace an aging VOR costs roughly $800K.

4) Increased controller flexibility for sequencing

In the Oceanic Environment - benefits include: _

Real Time Control
Optimum Wind Routing Flexibility
Reduced Separation
Enhanced Safety
Increased Capacity

IV. BENEFITS OF GPS USAGE TO WORLDWIDE AVIATION:

The U.S. has made the Global Positioning System available to civil aviation throughout the world, with no direct user charge, as an element of a worldwide Global Navigation Satellite System.

A. For air carriers, GPS offers a way to realize real cost savings (fuel and time).

B. Developing nations that cannot afford to install expensive ground systems will be able to offer services that otherwise would be unavailable.

C. All air traffic service providers and system users will benefit from higher levels of safety, capacity, and efficiency.

V. CONCLUSION:

A. Thank members of press for attending

B. Acknowledge AOPA/Transport Canada participation in flight testing

1) Private pilots were first to advocate the use of GPS. As it turns out, they are the first beneficiaries.

2) Introduce Phil Boyer. Acknowledge his personal leadership and participation. Example of government/industry partnership to realize the benefits of this new technology.

C. Goal is to achieve same level of cooperation and participation with the international community.

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REMARKS BY JOSEPH M. DEL BALZO
ACTING ADMINISTRATOR
FEDERAL AVIATION ADMINISTRATION
PARIS AIR SHOW
JUNE 11, 1993

I. INTRODUCTION

A. Thank representatives for coming.

B. Two years ago, on the advice of the ICAO Future Air Navigation System Committee, the worldwide aviation community endorsed the concept of a future air traffic management system which will take advantage of more powerful computers, the communications technology revolution, and satellite technology.

1) The FANS Committee, which included many of the world's top experts in the aviation technical infrastructure, spent seven years developing the overall concept for the future system. It was a truly remarkable collaboration.

2) The FANS concept envisions satellites as the primary means of navigation for en route, trans-oceanic, and the terminal area.

C. The United States offered, and ICAO accepted, the use of our NAVSTAR Global Positioning System as an element of the global navigation satellite system (GNSS).

1) We have offered the Standard Positioning Service of GPS to the world for the foreseeable future, without cost to the user, with a minimum of 6 years notice if we should have to withdraw the offer.

2) Twenty-four months after this remarkable offer was made, the worldwide aviation community finds itself in the throes of a transition between the kind of industry we have been for the last 50 years and the kind we will be...or want to be...for the next 50 and beyond.

3) Meetings like this are important because they give us all a sense of the direction we are moving...a chance to join in the debate about the critical choices ahead.

II. IMPLEMENTATION OF SATELLITE-BASED NAVIGATION IN THE U.S.

A. On June 9, the FAA announced that we have approved the supplemental use of the Global Positioning System navigation system for all phases of flight, including non-precision approaches to airports. (Transport Canada is expected to make a similar announcement very shortly, if they have not already done so.)

1) The FAA announcement included authorization to use GPS--the U.S. contribution to the ICAO Global Navigation Satellite System--to fly existing VOR, NDB, and RNAV approaches. This equates to nearly 5,000 GPS approaches at 2,500 airports in the U.S.

2) Testing began in July of last year, with Transport Canada and the Aircraft Owners and Pilots Association--a general aviation trade organization--providing the aircraft and flight crews.

3) Certification criteria for GPS receivers were issued last December and units will be available for purchase this Fall.

4) The GPS constellation will become operational this Fall. At that time, all 24 satellites will be functioning in their assigned orbits.

B. Next steps include feasibility demonstration of GPS to support very low minimum precision approaches (By 1995) and a GPS/GNSS differential correction system planned for Category I precision approaches and other uses. (By 1998).

III. STATUS OF MLS IMPLEMENTATION

A. Message is: We at the FAA have NOT turned our backs on the commitments we made to the international community concerning the Microwave Landing System.

1) ICAO Member States agreed at the 29th Assembly to proceed toward meeting the 1998 target date. We further agreed to re-evaluate the details of the MLS transition within the next three years, taking into account developments in satellite-based landing technology.

2) We will continue the active development of the Microwave Landing System because it is by no means certain that MLS will not have a role in final approach and landing.

IV. CURRENT AVIATION POLICY ON GPS-GNSS

A. I would like to make five points concerning what I believe is the current aviation policy on GPS-GNSS, as developed through the FANS Committee and the U.S. IGIA process:

1) We have offered the Standard Positioning Service of GPS to the world for the foreseeable future, at no charge to the users, with a minimum of 6 years notice if we should have to withdraw the offer. (Only the Standard Positioning Service has been offered. The Precision Position Service was not offered.)

2) Value-added services, such as integrity monitoring or a differential system for higher accuracy may not be "free", but could be paid for by various countries using normal aviation funding mechanisms. An example might be route charges, or the Trust Fund as is the case in the U.S.

3) The Global Navigation Satellite System--the GNSS which has been described in ICAO--and which we support--can and should be made "backward compatible" with the already existing GPS. This strategy will allow the aviation community to take advantage of GPS in the near-term while GNSS is evolving.

(Estimates are that the GNSS definition process, including the definition of technical and operational issues, could take up to 10 years to complete.)

4) We expect to participate as a full partner in defining the GNSS system.

5) We recognize the large civil utility of GPS to many user groups and constituencies, and we are working together to find the means to ensure its long-term availability to all.

B. I know there are still many technical and institutional questions to be resolved. The reservations which some of you have raised about the risks of dependence on a military-controlled satellite system have been expressed just as forthrightly within the Department of Transportation and the FAA.

1) We all recognize that the question of control is a legitimate issue. It also is important not to overblow this old issue. I would remind you that other U.S. systems such as LORAN, Omega, and VHF communications have been accepted and used by civil aviation throughout the world for decades. In all this time, they have never been shut down.

2) Transportation Secretary Federico Pena and Defense Secretary Les Aspin have set up a task force to investigate how the Pentagon's GPS can best satisfy both military and civil needs. The study group is expected to report to the two secretaries by year's end.

C. I don't wish to minimize the complexities which are involved in any transfer of responsibilities from the Department of Defense to the Department of Transportation, or in providing the assurances sought by international aviation bodies.

1) My experience indicates that negotiations will progress much more quickly if GPS is actually being used by civil aviation.

2) The active participation and support of other countries will greatly strengthen our case for more civilian oversight.

o The FAA will provide technical training and implementation support to those countries seeking to use GPS as a civil aviation navigation aid;

o Technical courses explaining the concepts and theories of GPS will be made available to countries desiring to gain the immediate benefits of satellite technology;

o Technical Standard Order C129, Airborne Supplemental Navigation Equipment Using GPS, which we issued last December, is readily available for use by other nations.

VI. BENEFITS OF GPS EARLY IMPLEMENTATION TO THE WORLDWIDE AVIATION COMMUNITY

A. In the En Route Environment-- GPS-GNSS provides navigation capabilities never before possible:

High quality navigation services without investing in expensive ground facilities. We may no longer need aging primary radar, or to buy, install, and maintain VORs and Category I instrument landing systems. (A full category I ILS today costs $1.7 million dollars; a VOR costs about $800K. U.S. spends $34 million to maintain VOR's and NDBs.)

B. In the Oceanic Environment--

1) Accurate navigation and instantaneous position reports and updates will provide major capacity increases, particularly in remote areas and over oceans. (ADS)
2) Reduced separation
3) Enhanced safety and capacity

C. In the Terminal Area-- nonprecision approaches to any runway-end in the world.

D. Overall benefits are hard to overstate. GPS-GNSS, combined with advanced telecommunications and higher levels of automation offers virtually unlimited opportunities for improvements in aviation safety, capacity, and efficiency.

1) Developing nations that cannot afford to install expensive ground systems will be able to offer services that otherwise would be unavailable.

2) Even in Europe, GPS may offer immediate and tangible benefits. As Sir Colin Marshall (Chief Executive of British Airways) has pointed out--inadequate infrastructure is a major constraint to growth and competition in Europe. GPS provides a low cost way to expand capacity through the more efficient use of crowded air space and airports.

3) All air traffic service providers and system users will benefit from higher levels of safety, capacity, and efficiency.

4) Air carriers will realize significant savings. Delays affect the economies of air carriers, regardless of national boundaries. There was an item in the trade papers not long ago reporting that here, in Europe, there are 130,000 hours of delay each year. One of our air carriers told us that altitude and speed restrictions, together with inefficient routings, cost them 108 million dollars in wasted time and increased fuel consumption annually. The problem is universal and will become even more serious as air travel begins to pick up. On a global scale, the International Air Transport Association reports that worldwide, delays cost carriers on the order of 3 billion pounds sterling each year.

Even a partial implementation of GPS-GNSS would bring early aviation benefits such as reduced delays and more efficient routings. This would mean significant economic benefits for all carriers. _

VII. COST ALTERNATIVE TO GPS

A. Before FAA embraced GPS/GNSS as a prospective national system, we asked Lincoln Laboratories to conduct a study to determine what it would cost to launch our own civil satellite system. The answer was between 8 and 9 billion dollars.

B. The European Space Agency, which at that time was considering the acquisition of a European system, had a similar study done by a Canadian consultant, apparently with similar results.

C. What all this means is that a nation or group of nations would need to invest this much--probably more--to duplicate what already exists.

VIII. CONCLUSION

At a time when governments everywhere are hampered by tight budgets, any proposals for major new infrastructure projects must offer compelling arguments to justify the investment. Our case for GNSS will be much more credible if...instead of promising benefits far in the future...we can begin now to show pay-off. Let us begin

now to build a record of performance while we work to resolve questions about the long-term system.
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REMARKS BY JOSEPH M. DEL BALZO
ACTING ADMINISTRATOR
FEDERAL AVIATION ADMINISTRATION
INTERNATIONAL REPRESENTATIVES' BREAKFAST
PARIS AIR SHOW
JUNE 12, 1993

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REMARKS BY JOSEPH M. DEL BALZO
ACTING ADMINISTRATOR
FEDERAL AVIATION ADMINISTRATION
TECHNICAL WOMENS' ORGANIZATION ANNUAL MEETING
DENVER, COLORADO
JUNE 22, 1993

Good Morning. When Barbara and Nancy first asked me to participate in this meeting, I wasn't sure that I would be able to make it. It's been a great honor and privilege to serve this agency as the Acting Administrator for the past few months, but the obligations of the job don't let me get away as often as I'd like. Meetings like this are important to me. Because if you stay in Washington too long, you begin to think that nothing really meaningful takes place unless it starts at 800 Independence Avenue. We need to be reminded from time to time that much of the creative thinking about the problems which confront us takes place out here, far from Washington.

I'm sure most of you have heard by now that President Clinton has chosen David Hinson as his candidate to be the FAA's next Administrator. I've spent many hours with Mr. Hinson, and I can tell you that we could not ask for a more capable and accessible leader. He still has to confirmed by the Senate, but we're hopeful that will take place very soon. Mr. Hinson has said that once he's confirmed, he plans to spend the first few months getting to know the people of the agency. I think you will find him quite different, in outlook, from past administrators. I'm not talking about politics or personalities, but about the perspective he will bring to the agency.

As an aerospace executive and the former Chairman of Midway Airlines, he has first-hand experience with the kind of problems that are besetting the airline industry. He will be our first administrator with combined experience in military and general aviation, domestic carriers, and aircraft manufacturing. I, for one, am looking forward to working with him.

I'm sure Mr. Hinson will want to talk to all of us about his agenda for the agency just as soon as he can. I don't want to second-guess what that will be, so this morning, I'm going to focus instead on your priorities...and help you however I can to develop your own vision for the future of this organization.

Based on my own experiences, I can tell you that the greatest problem you will encounter is that of your collective will. For people, in general, are suspicious of plans...and often distrustful of planners. In the 35 years that I have worked for the FAA, I have been described in many different ways, even called a name or two. Some have even spoken of me like George Bush used to talk about "The Vision Thing". Clearly, the meaning of vision is hard to define. But let me give you an example of what I believe it to mean.

Legend tells us that in the siege of the ancient city of Troy, thousands of Trojans heroically laid down their lives. Taking part in the battle was a Trojan prince named Aeneas. As he watched the city going up in flames around him, Aeneas knew that all was lost. So he gathered up as many of his fellow citizens as he could find and they escaped over the sea. Aeneas promised his people that he would lead them to a new homeland, but ten years of searching and struggle lay ahead until it was found. Along the way there were many tempting places to stop.

One of the first Aeneas came upon was a colony which had been founded a short while before by another band of Trojans. Here on the coast of Greece, these earlier refugees had discovered a landscape that had reminded them of their Trojan homeland. Nearby rivers resembled those that had flowed near Troy during the days of its glory. Here they had built a replica of their former city, exact in every detail, even down to the homes they had left behind.

But despite these familiar surroundings, Aeneas and his people knew that they could not stay there. They knew they must find a new future...not a copy of the past. So they sailed on. Eventually, according to the legend, Aeneas led his people on to Italy, the land where they where they were destined to found the Roman Empire.

What this story teaches us is that however painstakingly we may try to hold on to the past, we may draw upon its memory to sustain us, but we cannot dwell in its shadow. The lesson is as fresh today as it was 3,000 years ago. I recommend that you consider it as you develop your plans for what you would like your organization to be in the 21st Century.

Today the world of aviation, like the world at large, is experiencing a period of unprecedented change and unparalleled opportunity. We find ourselves in the throes of a transition...a transition from the way we have done business for the last 50 years, to how we will...or would like to do business for the next 50 and beyond.

Three years ago, I asked a small planning group to develop a vision for the air traffic control system of the future. Building upon the modernization efforts already underway, they devised a bold, new concept. This concept makes full use of advanced telecommunications and higher levels of automation now available with more powerful computers. The concept also calls for the early implementation of space-based technologies that will become possible this Fall when the U.S. NAVSTAR Global Positioning System becomes operational. I'd like to tell you about this future system, and the features which will distinguish the next generation of technology from what we have today. I'd like to tell you about a new initiative to re-examine our management principles...to plan the many far-reaching operational changes which our new technology will force upon us.

Those of you who work in the centers know that the first phase of the Advanced Automation System--the replacement of the computer peripherals system--is now complete. The next phase is the replacement of the existing controller work stations in the en route centers. For those of you who haven't seen them at IBM's demonstration facility, the new work stations--the Initial Sector Suites as we are calling them--will have enhanced displays that offer color, higher resolution, and better depictions of weather conditions. But when they start to arrive in the Centers? Perhaps sooner than you think...our new management strategy calls for delivering the first new sector suites to Seattle in 1996. It's a goal we don't intend to miss.

These same workstations will go into several of our larger Terminal Radar Approach Control facilities where they will provide the computer architecture to support a further improvement called Terminal Air Traffic Control Automation...or TATCA. When TATCA is in place, controllers will have top-of-descent, approach spacing, and sequencing aids to handle higher levels of traffic in the terminal area with greater efficiency and safety. The payoff from TATCA will be additional capacity at those airports which today are choked with congestion.

Our research and development organization is working on a parallel effort...an adjunct of AAS called Automated En-Route Air Traffic Control, or AERA. With AERA, our air traffic managers will be able to dynamically reconfigure airspace...simply and quickly...to adjust to workload, to reroute aircraft around bad weather, and to provide pilots with the route of their choice.

The Advanced Automation System is one of the programs we "must have" program if we are to achieve our future system vision.

The second program we must have, for safety as well as economic reasons, is digital communications. At 31 airports in the United States, pilots can receive predeparture briefings today over a digital datalink instead of the old radio-based system. By the end of 1995, we plan to extend this service to 60 airports. We've just completed a datalink version of the Automatic Terminal Information Service which we intend to begin deploying at Houston, Texas, next year, to give pilots similar improvements in the flow of information during the terminal approach phase of flight.

By the end of the decade, if not sooner, data link will be available for every facet of flight, and for all users of the airspace. In a later, more complex form, datalink will become part of a vast, interlocking system of computers, satellites, sensors, and software called the Aeronautical Telecommunications Network or ATN. The ATN provides a communications architecture that takes those services which presently function through independent networks...air traffic control...fixed base operations...flight, airport, and airline operations...and integrates them into a single, coherent management system. The Network is being designed to create a seamless, borderless air traffic control system that can be used, worldwide, sometime after the turn of the century.

But the technology with the most revolutionary implications for air traffic control is the Global Positioning System, or GPS. Two years ago, the use of satellites was little more than a theoretical concept. Today, the transition to that system has begun. Two weeks ago, we announced that we have approved the supplemental use of the Global Positioning System navigation system for all phases of flight, including non-precision approaches to airports.

Our announcement included authorization to use GPS to fly existing VOR, NDB, and RNAV approaches. This equates to nearly 5,000 GPS approaches at 2,500 airports in the United States. This past December, we issued certification criteria for GPS receivers. We expect units will be available for purchase this Fall, along about the same time the GPS constellation becomes operational, we hope. Also, this September, we plan to request proposals for flight demonstrations to evaluate the ability of GPS to perform a Category-3 precision approaches. We looking at flight tests to begin late next year. The significance of these tests can't be overstated, for they will, most certainly, have a bearing on the decision to proceed with the deployment of the Microwave Landing System.

You don't have to be a visionary to see ahead to the very substantial savings that the use of GPS offers. We may no longer need to replace aging primary radar, or to buy, install, and maintain VORs and Category I instrument landing systems.

In the vision of the future which we have developed, computers will perform many routine functions, leaving the controller free to concentrate on matters which call for human judgement and decision-making. Aircraft will move through the airspace with a greater margin of safety, fewer delays, and with a wider choice of fuel efficient routes.

One of the major challenges facing us is to manage the transition of our workforce to the air traffic system of the future. In the final analysis, the principal contributor to a safe and

efficient air transportation system is an adequately staffed, well-trained, highly motivated and diverse workforce. Our challenge is not to become so preoccupied with the engineering aspects of modernization that we overlook the critical role of human resources. Even with the introduction of hardware designed for high reliability and low maintenance...even with our use of sophisticated automation...we will continue to depend on aviation professionals to keep the system up and running.

We have planned in micro-detail the engineering features of our complex new systems. But we have been slow to plan for the impact of this technology on the way we do our routine work...on the rules and procedures and decision-making apparatus...on the way we relate to each other in the day-to-day activities of the agency. The Operational Vision for 2010 which Dorothy (Berry) will discuss later this morning addresses this oversight.

It's not just our technology which is changing. The character of the FAA as an organization...as a place to work...is undergoing fundamental change as well. Like many other forward-looking public agencies, the FAA's approach to change reflects a fundamental rethinking of the role of government which has emerged in the nineties--a paradigm shift much like that documented in the book, Reinventing Government, by David Osborne and Ted Gaebler.

The message of the book is simple: there is a revolution under way in government, as people demand more from public services while being prepared to pay less in taxes. It's quite unlike the reigning political philosophy of the 1980s which sought to reduce, even eliminate, many government services. Today the emphasis is on providing better quality public services without increasing the cost to the taxpayers.

Recently, the FAA published a new set of concise management principles which will provide direction for the entire organization and define a radically new way of doing business. Our objective is to add value to the wide range of services the FAA offers to the public and the aviation community, while actually decreasing the unit costs of our operations. In part, this effort is driven by the cost containment measures and staffing reductions initiated by the Clinton Administration. But it also makes sense given the economic hardship within our industry and the burden of the federal deficit. In an era of dwindling resources and increasing demand for our services, we have to master the challenge of doing more with less.

As part of a long-term plan to simultaneously modernize both the technology and the organization of the FAA, we have established a set of specific performance goals, all of which are aimed at increasing our level of service, improving our efficiency, and upgrading our quality. And all to be achieved while we work to reduce our unit costs.

A commitment to service is, too often, a neglected virtue. Many government agencies have the reputation of being inward-looking and self-absorbed, oblivious to the needs of the public they are mandated to serve. While the FAA has never neglected its many obligations and responsibilities, we can nonetheless strive to become more customer-centered -- to be fully responsive to the diverse needs of those who use our services.

As an agency, we should be outward-oriented, ever alert to both the current and the changing needs of our customers, and careful to always evaluate our performance from the standpoint of what our customers think of us, rather than what we think of ourselves.

Efficiency is another attribute we seldom associate with government. In old-style bureaucracies there was often little incentive to shave costs, eliminate duplication of effort, trim redundant layers of management, streamline procedures and eradicate waste. Efficiency itself rarely figured as a major factor in the choice of those to be rewarded and promoted. But in the FAA which is emerging, cost-consciousness will be highly valued.

Our executives will be given much more flexibility in how they manage their staffs and allocate their resources. But they will also be held accountable for delivering products and services on schedule and within budget.

The third of our performance goals expresses the importance that we at the FAA are placing on quality. The push for quality which has energized American industry has now begun to transform American government. At the FAA, we recognize that if we are to succeed as a customer-centered organization, the quality of our service will depend not only on the advanced level of our technology but on the professional standards of our workforce.

We are committed, as an agency, to building a diverse workforce of highly competent, motivated, technically and managerially sophisticated professionals. We believe that our investment in human resources must match our investment in air traffic control technology.

There's an interesting parallel between what's happening in the FAA and another well-known institution--I'm talking about the television series, "Star Trek".

All of us know, from the late night reruns, that the original starship Enterprise was run almost exclusively by white males. True, there was a black female communications officer and an Asian helmsman. But the non-white skin colors usually belonged to exotic non-human species.

Star Trek: The Next Generation, the 1980s relaunch of the series, showed distinct signs of progress. The intellectual Captain Jean Luc Picard replaced the tough-guy, Captain Kirk. The ship's chief engineer is a visually impaired black male. The role of security officer is performed by another black male. And the ship's doctor is a woman.

Now, this year, a third series...Star Trek: Deep Space Nine...is being produced. The 90s version is set on a stationary space station rather than a roving starship. And the leading roles have been assigned to minorities and women. The commander is Ben Sisko, a black single parent. His deputy is a woman and another character is a fusion of genders -- a young woman's body with the memories of an old man.

The station is packed with aliens of all shapes and sizes, many of whom dislike and misunderstand each other...not unlike our own experience as members of a multi-racial, multi-cultural society.

One purpose of science fiction is to imagine possible futures. In this instance, the changing composition of the Star Trek cast has been an accurate advance look at the changing makeup of the FAA workforce. We're making steady progress toward our goal of achieving a balanced mix of races and cultures and genders at all levels of the FAA...in every part of our organization.

This year's candidate development program includes 6 women and 5 minorities. You may know some of them. Joann Kansier is the program manager for the Voice Switching and Control System. Alice Wong is the manager of the Performance Analysis Branch in System Maintenance. I congratulate all those who were selected. But we aren't there yet and we know it.

It's been said that each of us is a time traveler...moving from the past to the future. To achieve the broad objectives that I have outlined, the FAA must become an organization with a heightened capacity to learn and adapt -- one which sets ever higher standards for itself, measures the discrepancy between promise and performance, and seeks constantly to narrow the gap.

To succeed, we depend on the Technical Womens Organization, the Professional Women Controllers, and our employee coalitions to help us create new visions and to realize the best of all possible futures.

Thank you.

REMARKS BY JOSEPH M. DEL BALZO
ACTING ADMINISTRATOR
FEDERAL AVIATION ADMINISTRATION
NBAA ASSOCIATE MEMBERSHIP
ADVISORY COUNCIL
JUNE 28, 1993
WASHINGTON, DC

Good Morning.

I'm pleased to have this opportunity to talk with you about events taking place at the FAA. Serving as the Acting Administrator during these tumultuous times for our industry has been quite a challenge. Looking back, I can tell you that, even for a short period, it's a far more difficult task than I had imagined it would be. I'd like to thank Jack (Olcott) and the NBAA membership...and all the aviation associations...for your support over the past few months.

We're all fortunate that President Clinton has selected David Hinson, a man with first-hand experience in dealing with the kind of problems that are besetting both the air carriers and general aviation, to be the next FAA Administrator. I don't believe we could ask for a more capable, more accessible, leader.

When Jack invited me here today, he asked that I discuss two topics: One is what changes in access limitations and user charges do I foresee for business aviation. The other is how the traffic control system will evolve during the next five years.

I'd like to comment on the user charge issue first. Did any of you see President Clinton's press conference the other day--the one where the reporter asked the President what he planned to do about a U.S. naval ship entering the New Zealand harbor carrying nuclear materials? The President thought for a few seconds then replied that he didn't have any ideas at all about that, and anything he said would probably just get him in trouble.

The question of user charges for general aviation is almost as explosive as a nuclear rocket, and I'd be wise to follow the President's example. But I'll try to answer the question as best I can.

The cost of the U.S. airspace system in 1993 is over nine billion dollars. We attribute 62 percent of these costs to air carriers, 26 percent to general aviation, and 12 percent to public sector aircraft. This puts general aviation's share of the cost at about 2 billion dollars.

But the total amount that general aviation will pay, in the form of taxes on gasoline and jet fuel, will come to only 165 million dollars...that's about a 7 percent of the cost. The rest will come from the general fund and from interest on the cash balance in the trust fund. By way of comparison, we recover 97 percent or more of the costs attributed to air carriers.

I bring up these numbers...not to foment argument, but to make this point: General aviation in this country gets a very good deal. I think you know that. Given these austere times, will someone, someday decide that it's too good a deal and propose that general aviation pay on a direct basis for the services it uses? I don't know.

Driving to work last week, I heard a report over the radio that Andre Agassi, the 22 year-old tennis celebrity, had bought a 2 million dollar Lear Jet and hired a crew to fly him to his matches. There probably are few athletes that spend more time in airplanes than tennis stars. But the story wasn't about the rigors of getting to virtually every point on the globe from Las Vegas--and arriving fit to compete in a tennis tournament. It wasn't about competition, money, convenience, or lost opportunities. The purchase of the jet was reported as a self-indulgent extravagance. The NBAA and its leadership have done much to dispel this notion, and to promote business aviation as the "working persons' airlines". Yet far too many people still consider it the domain of rock stars, hollywood types, and overpaid corporate executives. It is this image that makes business aviation politically vulnerable.

A minute ago I said that general aviation gets a very good deal. It's important to say that it also gives back a very good deal. General aviation is a vital link in our national transportation system and in our national economy. It creates over half a million jobs and is one of the mainstays of the U.S. export trade. To those of us here, this is an old story, grown stale with the retelling--the standard rhetoric in speeches that we give to each other. But for the general public, it's still largely a story untold...a story unknown...a story not well understood.

This past October, our Flight Standards Office issued the first General Aviation Action Plan. This isn't just an FAA plan. It was developed in partnership with NBAA and other trade and industry associations. The coalition which grew out of this planning activity meets regularly for the express purpose of promoting general aviation safety and prosperity. A strong and thriving general aviation sector will create quality jobs and help America maintain its technical leadership. This is what we at the FAA are working with you to achieve.

I'd like to go back to the subject of user fees to mention, briefly where we stand with the MASSPORT proposal, although there is very little to report at this time. Most of you know, I'm sure, that MASSPORT has presented a proposal for airfield user charges at Logan Airport. The plan includes a revised weight charge, an operations charge, and a peak hour landing and take off charge. The proposal is presently undergoing review by senior personnel in the Office of the Secretary and in the FAA. We'll let you know of any new developments just as soon as we're able to do so.

I believe there is a sensible solution to the problem of user fees and limited access. That solution lies in providing adequate capacity to meet the demand. Our latest forecasts predict that, over the next decade, the number of passengers using U.S. commercial air services will increase from an average of 1.3 million a day to over 2 million.

If these forecasts are accurate, a 25 percent increase in air carrier operations may be needed to meet this demand. Today, the top 100 of the nation's busiest airports account for 95 percent of all air carrier passengers and 92 percent of all air carrier operations. Such concentration leads inevitably to delays and delays lead to calls limitations on access.

The FAA is presently engaged in a three-way effort to expand capacity and increase system efficiency. The first of these is through the continued modernization of the national airspace system. The second is by funding airport infrastructure improvements. And the third is by alleviating environmental and economic constraints at the local level. I'd like to talk briefly about all three, beginning with the evolution of the air traffic control system and the important features that will distinguish the next generation of technology from what we have today.

We're in the eleventh year of a multi-billion dollar program to improve safety, increase capacity, and ease pilot and controller workloads. The agency is literally reinventing itself with new technology, including an advanced automation system that's one of the most powerful and complex real-time computer systems ever built.

The first phase of the AAS, the replacement of the computer peripherals system, is complete. The next phase is the replacement of the old computer work stations in the en route centers. The new work stations--called Initial Sector Suites--will have enhanced full-color displays that offer higher resolution and better depictions of weather conditions. We expect the new work stations to arrive at Seattle Center in 1996.

These same workstations will go into several of our larger Terminal Radar Approach Control facilities where they will provide the computer architecture to support a further improvement called Terminal Air Traffic Control Automation...or TATCA. When TATCA is in place, controllers will have top-of-descent, approach spacing, and sequencing aids to handle higher levels of traffic in the terminal area with greater efficiency and safety. The payoff from TATCA will be additional capacity at those airports which today are choked with congestion.

The new workstations are also required before we can implement a program we call AERA--Automated En-Route Air Traffic Control. AERA will enable our managers to dynamically reconfigure airspace...simply and quickly...to adjust to workload, to reroute aircraft around bad weather, and to provide pilots with the route of their choice. Aircraft will be able to move through the airspace with a greater margin of safety, fewer delays, and with a wider choice of fuel efficient routes.

The Advanced Automation System is a "must have" program if we are to cope effectively with the future demands for air traffic control services.

Another technology that is evolving rapidly is digital communications. At 31 airports in the United States, pilots can receive predeparture briefings today over a digital datalink instead of the old radio-based system. By the end of 1995, we plan to extend this service to 60 airports. We've just completed a datalink version of the Automatic Terminal Information Service which we intend to begin deploying at Houston, Texas, next year, to give pilots similar improvements in the flow of information during the terminal approach phase of flight.

By the end of the decade, if not sooner, data link will be available for every facet of flight, and for all users of the airspace. In a later, more complex form, datalink will become part of a vast, interlocking system of computers, satellites, sensors, and software called the Aeronautical Telecommunications Network or ATN. The ATN provides a communications architecture that takes those services which presently function through independent networks...air traffic control...fixed base operations...flight, airport, and airline operations...and integrates them into a single, coherent management system. The Network is being designed to create a seamless, borderless air traffic control system that can be used, worldwide, sometime after the turn of the century.

But the technology with the most revolutionary implications for air traffic control is the Global Positioning System, or GPS.

We are committed, as an Agency, to bring the benefits of GPS and GNSS to users as quickly as we can...and to achieve an orderly, staged deployment of the technology consistent with our over-riding responsibilities for aviation safety.

On June 9th, the FAA announced that we have approved the supplemental use of GPS for all phases of flight, including non-precision approaches to airports. Our announcement includes authorization to use GPS to fly existing VOR, NDB and RNAV approaches. This corresponds to nearly 5 thousand GPS approaches at 25 hundred airports in the United States.

This step follows by less than a year, the beginning of GPS tests using aircraft and flight crews provided by Transport Canada and the Aircraft Owners and Pilots Association, a general aviation trade organization.

FAA certification criteria for GPS receivers were issued last December and units are expected to be available for purchase sometime this fall.

Another milestone event...one crucial for all that is to follow...also takes place late this fall when the full GPS constellation becomes operational. At that time, all 24 satellites -- 21 active and 3 "hot spares" -- will be functioning in their assigned orbits.

The first country to test GPS on a national scale will be the island nation of Fiji. It is an ideal environment in which to evaluate the technology because of the vast areas of low-density airspace. Fiji's 300 islands are spread over nearly 400 thousand square miles with 19 airfields serviced by only five navigation aids. A typical flight crosses as much as 150 miles of ocean in visibilities of less than 5 miles...and all without navigational guidance of any kind.

The FAA will work closely with the Fiji Civil Aviation Authority in setting up procedures for using and evaluating GPS in all en route and terminal operations. What we learn from this six month experiment will help us better understand the capability and reliability of GPS in actual day-to-day operation.

This project is preliminary to the next steps we are planning...a demonstration of the feasibility of GPS in very low minimum precision approaches is planned for 1995. A GPS-GNSS differential correction system is planned for Category I precision approaches in 1998. Both will mark significant advances in our program to move steadily but incrementally into the era of satellite-based navigation.

With all the excitement about the prospects of GNSS, there are some who would urge us to abandon the Microwave Landing System. But it would be premature to discard what was -- and still is -- a promising new technology. Prudence dictates that we keep an open-mind.

The international aviation community has agreed to proceed toward meeting the 1998 target date for implementation of the MLS. We further agreed to re-evaluate the details of the MLS transition within the next two years, taking into account the new developments in satellite-based landing technology. We at the FAA will not back away from this commitment to the international aviation community.

Until we know whether GPS is feasible for Category III approaches, we must continue the active development of MLS. Moreover, it is entirely possible that MLS may still have a role in final approach and landing. There is enough uncertainty surrounding this question that the final outcome could still involve a surprise or two.

But, assuming no major mishap or detour along the way, we have laid out a straightforward course for achieving a smooth implementation of GPS-GNSS.

One of the major challenges facing us is to manage the transition of our workforce to the modernized air traffic control system of the future. Even with the introduction of hardware designed for high reliability and low maintenance...even with our use of automated controller tools...we will continue to depend on air traffic control specialists and maintenance technicians to keep the system up and running.

In the final analysis, one of the principal contributors to system capacity is an adequately staffed, well-trained, highly motivated workforce. We must never become so preoccupied with the engineering aspects of modernization that we overlook the critical role of human resources.

Another major initiative to enhance capacity centers on the nation's airports. One promising possibility for adding airport capacity results from the military downsizing which is now underway. Former military airfields closed under the provisions of the Defense Base Closure Acts feature prominently in our capacity plans and will be a major source of new capacity to the nation's civil aviation sector.

Successful transfers to date include the Orlando Airport, formerly McCoy Air Force Base, and Stewart Field in New York. We've took over operation of the airport at Myrtle Beach Air Force Base after it was closed this past March. We're planning to take over the approach control radar at Grissom Air Force Base in order to continue service to satellite commercial airports in the Indianapolis area. We're developing Manchester Airport in New Hampshire to relieve congestion at Boston's Logan International, and to provide needed capacity in the New England area. We're doing the same thing at Scott Air Force Base in Illinois to relieve congestion at St. Louis International Airport.

There is substantial airport infrastructure available for conversion throughout the country, which can provide valuable added capacity to complement existing civil airports. But plans to build and expand airports must always contend with local concerns about the environmental and economic impact of new projects. Dealing fairly and effectively with such concerns define our third broad initiative to create capacity.

The capacity of the nation's airport and air traffic control system is increasingly dictated by the environmental and economic constraints at the local level. We at the FAA are acting to relieve potential constraints on capacity imposed by aircraft noise through research and through land use planning programs.

To date, more than 200 airports have initiated, and more than 100 have completed, reviews of their noise impacted areas and established programs to reduce existing non-compatible land uses. Our expenditures to date total 1.2 billion dollars for landside noise mitigation efforts.

These three initiatives to enhance capacity -- NAS modernization, airport infrastructure improvements and the alleviation of environmental constraints -- these three share a common premise: that the way to solve our problems is through growth, not through constriction. Vigorous growth, we are well aware, has its own penalties. But they are far less costly, in the end, than the devastating consequences of a shrinking economy and a dwindling demand for aviation services. The aim of the FAA is to give our industry the freedom it needs to search for whatever new opportunities a dynamic marketplace creates.

Thank you.

REMARKS BY JOSEPH M. DEL BALZO
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FEDERAL AVIATION ADMINISTRATION
(Delivered by Steve Zaidman, Director
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GLOBAL NAVCOM 93 SYMPOSIUM
SEATTLE, WASHINGTON
JUNE 29, 1993

Thank you. It's a great pleasure to participate in this prestigious meeting. The last time some of us got together was just two months ago in Reston, Virginia...at the first Symposium on Worldwide Communications, Navigation, and Surveillance. There were more than 500 people there, from a number of countries.

One comment was heard over and over again, at the technical sessions and in the hallways and around the dinner tables. The "main buzz" of the conference was the speed with which GNSS has gained momentum. The pace of developments has astonished everyone, I think. Even those of us who have been closely involved in the details of policy-making. We've had to continuously revise our long-range plans to accommodate the fact that GNSS is going to be a fully operating system earlier than any of us would have predicted, even a year or two ago.

There are three other observations I'd like to make about the Reston Symposium because they relate to themes which I expect will be running through the proceedings here in Seattle during the next three days. The first observation concerns the impressive quality of the technical research which is being done throughout the world. Advanced technology is no longer the monopoly of any single nation. It can no longer be hidden away in laboratory files. In fast-changing fields, knowledge knows no national boundaries and intellectual property is an international asset.

In no field is this more true than our own. For the essential scientific and engineering concepts which make GNSS possible are accessible to virtually everyone and are openly exchanged in the free market of ideas. All of us in aviation can only benefit from an open, unfettered flow of information. For the long-term success of GNSS will critically depend on our ability to find timely technical solutions to our problems, whatever their source.

The second observation concerns the expressions of urgency we heard from potential users. The commercial carriers have been especially vocal in advocating that the FAA speed up the process of transition. The ten year phase-in period we've outlined is

criticized as just another example of FAA inertia.

But, of course, there are others who feel that we're pushing too hard and too fast on GPS. That with all this momentum, we'll be led to make rash and premature decisions. I think that, given the gigantic scale of this innovation and our far-reaching responsibilities as a government agency...a ten year time frame cannot be reasonably faulted.

The third observation concerns the overall strategy for introducing GNSS. It was reassuring to see the formation of an apparent consensus at Reston in support of incremental implementation. Many pointed out the hazards of postponing the introduction until some time in the future...perhaps distant future...when a complete, total system could be put in place all at once. They feared that delay would increase the chance of endless haggling among governments and aviation authorities and result, eventually, in stalemate and lost opportunity.

These are all issues about which the FAA has taken clear positions, and today I'd like to take a few minutes to explain our thinking. We are committed, as an Agency, to bring the benefits of GPS and GNSS to users as quickly as we can...and to achieve an orderly, staged deployment of the technology consistent with our over-riding responsibilities for aviation safety.

On June 9th, the FAA announced that we have approved the supplemental use of GPS for all phases of flight, including non-precision approaches to airports. Our announcement includes authorization to use GPS to fly existing VOR, NDB and RNAV approaches. This corresponds to nearly 5 thousand GPS approaches at 25 hundred airports in the United States.

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The first country to test GPS on a national scale will be the island nation of Fiji. It is an ideal environment in which to evaluate the technology because of the vast areas of low-density airspace. Fiji's 300 islands are spread over nearly 400 thousand square miles with 19 airfields serviced by only five navigation aids. A typical flight crosses as much as 150 miles of ocean in visibilities of less than 5 miles...and all without navigational guidance of any kind.

The FAA will work closely with the Fiji CAA in setting up procedures for using and evaluating GPS in all en route and terminal operations. What we learn from this six month experiment will help us better understand the capability and reliability of GPS in actual day-to-day operation.

This project is preliminary to the next steps we are planning...the demonstration of the feasibility of GPS in very low minimum precision approaches is planned for 1995. A GPS-GNSS differential correction system is planned for Category I precision approaches in 1998. And both will mark significant advances in our program to move steadily but incrementally into the era of satellite-based navigation.

With all the excitement about the prospects of GNSS, there are some who would urge us to abandon the Microwave Landing System. But it would be premature to discard what was -- and still is -- a promising new technology. Prudence dictates that we keep an open-mind.

The ICAO member states agreed at the 29th Assembly to proceed toward meeting the 1998 target date. We further agreed to re-evaluate the details of the MLS transition within the next two years, taking into account the new developments in satellite-based landing technology.

We at the FAA will not back away from this commitment to the international aviation community. Until we know whether GPS is feasible for Category III approaches, we must continue the active development of MLS. Moreover, it is entirely possible that MLS may still have a role in final approach and landing. There is enough uncertainty surrounding this question that the final outcome could still involve a surprise or two. But, assuming no major mishap or detour along the way, we have laid out a straightforward course for achieving a smooth transition to GPS/GNSS.

I would like to make five points concerning our current policy -- one developed through the FANS Committee and U.S. IGIA process.

First, let me re-iterate what is now very well known. We have offered the Standard Positioning Service of GPS to the world for the foreseeable future, at no charge to the users...and with a minimum of 6 years notice should we have to withdraw the offer.

Second, there are an assortment of value-added services which may not be made available without cost, but which could be financed through the different aviation funding mechanisms which exist in various countries. I'm referring to such add-on services as integrity monitoring or a differential system for higher accuracy.

Third, the Global Navigation Satellite System, as envisioned by ICAO, can and should be made "backward compatible" with the already existing GPS. The technology of tomorrow should be designed to work with whatever technology we adopt today. This strategy will allow the aviation community to begin to profit immediately from GPS while we work out all the details for GNSS...a process which may take up to a decade.

Fourth, we expect to participate as a full partner in defining the GNSS system. For we recognize the necessity of developing a common worldwide approach to communication, navigation and surveillance... as an instrument of policy for promoting international trade and economic cooperation.

And fifth, we recognize the value of GPS to many potential users with diverse interests and requirements. The FAA is working with many of these constituencies in order the find the means of ensuring the long-term availability of GPS to all.

One of these users...one, obviously, with a very strong claim...is, of course, the military. And I know there are still many technical and institutional questions to be resolved. The reservations which some of you have raised about the risks of dependence on a military-controlled satellite system have been expressed just as forthrightly within the Department of Transportation and the FAA.

We all recognize that the question of control is a legitimate issue. But it is also well not to exaggerate its importance. For the situation is not without precedent. Other systems which we have used for years without interference or interruption -- systems such as LORAN, Omega and VHF communications -- all of these were developed originally under military auspices and only later made available for non-military use.

So the issue already has some history, and it is not one which should be cause for unnecessary alarm.

Transportation Secretary Federico Pena and Defense Secretary Les Aspin have set up a task force to investigate how the Pentagon's GPS can best satisfy both military and civil needs. The study group is expected to report to the two Secretaries by the end of the year.

I don't wish to minimize the complexities which are involved in any transfer of responsibilities from the Department of Defense to the Department of Transportation, or in providing the assurances sought by international aviation bodies. But experience with other systems indicates that negotiations will progress much more smoothly if GPS is actually being used by civil aviation..even while talks are proceeding. The active participation and support of other countries will greatly strengthen our case for more civilian control.

As an Agency, we seek international cooperation on a broad front. We stand ready to provide technical training and implementation support to any country with an interest in using GPS as an aid to navigation in civil aviation. But, in today's world, technical assistance is no longer one-sided. Everyone benefits because technical competence is now found everywhere.

The Reston Symposium last April was proof that our intellectual pool is now a global pond. So we invite collaboration during this still formative period in the development of GNSS technology...at a time when many key engineering and policy decisions are still to be made. We welcome any contribution from any quarter...because the unresolved issues are formidable, the unanswered questions perplexing.

Cooperation on GNSS is, of course, closely tied to another vital development in our evolving technology -- that of digital communication.

The one critical requirement in all our planning is the easy, efficient flow of information. This is the reason data link is perhaps the one central concept and why FANS has recognized that progress will be impossible without a agreement on a unified digital communications system. An ICAO panel is now at work on such an agreement, and the FAA has turned to the RTCA for help. Once we have consensus, we will see a burst of new developments.

By the end of the decade, if not sooner, the FAA's new digital data link communication system will be available for every phase of flight, and for all users of the airspace. In a later, more complex form, datalink will become part of a vast interlocking system of computers, satellites, sensors and

software called the Aeronautical Telecommunications Network or ATN.

The ATN will provide a communications architecture that takes those services which presently function through independent networks...air traffic control...fixed base operations...flight, airport, and airline operations...and integrates them into a single, coherent management system.

The Aeronautical Telecommunications Network is being designed to create a seamless, borderless air traffic control system that can be used...world-wide...sometime after the turn of the century. ICAO has taken the lead in deciding that this technology will be the international standard.

The ATN concept is a dramatic one because it emphasizes that the air traffic control system which is emerging is not a single technological development...but an intricately interwoven complex of technologies. It is the contention of one historian that there have been four great revolutions in the history of transportation.

The first was, of course, the invention of the wheel...sometime back in Neolithic times. The second was the simultaneous use of the stirrup, shoulder harness, and horseshoe during the Middle Ages. The third was the construction of sturdy ocean-going vessels by the Portuguese in the fifteenth century, simultaneous with the discovery of improved navigational and mapping techniques. The fourth was the invention...in the latter part of the nineteenth century...of the ball-bearing, the spoked wheel, and the pneumatic tire -- and thus the creation of the bicycle.

Three of these great revolutions were not the result of single inventions, but of several independent discoveries...each of which reinforced the historical significance of the other.

I believe that we find ourselves in just such a situation today. We are on the verge of an historic advance in air traffic control...and this is a moment made possible by a confluence of discoveries -- in computers, communications and satellite technologies. It is our privilege to be able to participate in this revolution and to work together to realize its potential.

Thank you.