Potential Cost Savings Ideas for FAA and Users

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Introduction: The intent of this paper is to catalogue potential cost-savings ideas which impact both the FAA and the aviation community. These ideas have come from various sources including MITRE, Coopers & Lybrand (C&L), FAA studies, General Accounting Office (GAO), user groups, and the insights of individual staff members. Some of these ideas are currently being implemented by the FAA to various degrees but might be expedited if certain implementation problems can be overcome, including additional capital investment funds.

These potential cost-savings ideas do not represent the position of the Commissioners or the staff. Most, if not all of these ideas, have opponents. Some have been proposed previously but have met resistance from stakeholders and/or customers (both internal and external to the FAA).

Due to the lack of supporting data, the Commission staff has a low level of confidence in many of the savings projections included in this paper. In some cases, where no information was available, savings projections are not represented. The Commission staff will continue to refine these estimates. No attempt should be made to add the potential cost-saving ideas for the following reasons: 1) overlap exists amongst the cost-savings ideas , 2) it would not be reasonable for the FAA to manage many of these ideas simultaneously, and 3) many of the ideas require large up-front investments. Most of the savings opportunities identified for airspace users, require significant implementation staffs and training of FAA personnel. At the request of the Commissioners, the staff is prepared to research subsets of the ideas presented in this paper (or other opportunities not identified).

Savings are separated into two categories: those impacting the FAA's operating and maintenance costs, and those cost-saving ideas that reduce the operating costs of airlines and other users. Some "savings" estimates are actually FAA cost avoidance (i.e., the FAA will not have to increase costs as much as originally planned or at all). Other "savings" ideas are actually realigning costs from the FAA to the private sector because of the nature of the activity. Cost saving opportunities for users in some cases require both up-front investments and additional follow-on operational and maintenance support.

Our approach is to lay out the cost-savings ideas and associated issues, describe the impacts on FAA and the aviation community, state the time frame in which savings might be achieved (near term being up to 2002, mid term being 2003 to 2007 and far term being 2008 and beyond), describe up-front investments required, and show projected savings (either annually or the total through 2002).

The costs and savings presented in this paper do not account for the savings already achieved by the FAA in a series of budget-reducing actions taken since 1992. From 1992 to 1997, the FAA's funding in constant dollars has decreased by more than 12%. The FAA's personnel levels have declined substantially in response to the National Performance Review's directive to reduce administrative and overhead functions. Overall, in non-safety areas, the FAA has reduced its work force by more than 15%; in some areas, such as administration, by more than 25%.

Additionally, in response to the Government Performance and Results Act (GPRA) of 1993, the FAA is preparing a comprehensive annual performance plan, beginning with FY 99 for each

program activity. The plan establishes objectives and measurable performance goals linked to resources need to accomplish those goals. FAA's budget submission in FY 99 will also include specific linking of expenditures to performance goals. Once completed, the plan serves as a benchmark in investment decision-making as well as a vehicle to measure opportunities for improvement. If there are questions regarding these initiatives, the staff would be happy to provide the commissioners with more information.

Finally, the FAA is in the process of developing a cost accounting system that is due to be on-line by the beginning of 1998 and collecting a full range of data by the beginning of 1999.

1. Cost Saving Ideas for the FAA

1.1 Rapid Navigation System and En Route Radars Transition:

The transition to a global positioning system (GPS)-based navigation system will significantly reduce the FAA's maintenance costs *after* the existing navigation systems are decommissioned. For decommissioning to occur, however, the FAA and user community must transition to new equipment. Under current planning, the FAA will develop and deploy the Wide Area Augmentation System (WAAS) to replace long range radars, VORs, non-directional beacons (NDBs), and Category I (CAT I) Integrated Landing Systems (ILSs). Until full transition occurs, the FAA must operate and maintain the old and new equipment. This section explores potential opportunities to both reduce the cost and implementation schedule of the WAAS system *and* reduce the time required to decommission.

1.2 Potential WAAS Cost and Schedule Reductions:

Effectively, GPS without WAAS, but with some form of GPS integrity monitoring, may be sufficient right now for all navigation needs through non-precision approach. Some concern exists today over the ability of WAAS to provide CAT I precision approaches at airports within the baseline costs (approximately $500M). Without CAT I capability, some believe the WAAS could be significantly down-scoped or scrapped altogether. CAT I capability would be picked up through the Local Area Augmentation System (LAAS). Development and implementation of LAAS would occur independently from WAAS. Without WAAS additional LAAS sites would be required. The programmatics of a down-scoped WAAS program have not been thoroughly addressed.

Issues: The FAA engineering community argues that the accuracy of "raw" GPS, even with the existing National TESTBED system, cannot support decommissioning of the (very high frequency omnidirectional range (VORs). Air Transport Association (ATA) supports the idea that using the National TESTBED system with minimal upgrades would suffice as a WAAS replacement (assuming no CAT I capability). A compromise might be achieved with a WAAS system of reduced cost and complexity or simply focus on delivering GPS integrity monitoring function.

WAAS might need redirection to focus on delivering only an integrity monitoring function. Some funds would be required for retirement/cleanup of navaid and radar sites.

- **Time Frame:** Near term
- **Up-front Investment Required:** Modest, users would need to purchase GPS receivers.
- **Potential Savings:** Up to $100M/year by canceling or redirecting the WAAS contract.

1.3 Accelerated Decommissioning of NAVAIDS:

For the FAA to reduce its cost of providing navigation data, existing radars, very high frequency omnidirectional ranges (VORs), (NDBs), and ILSs would have to be decommissioned. The sooner decommissioning takes place, the sooner the FAA will be able to reduce its maintenance work force. Acceleration can occur only if system users have equipped with the proper avionics. Until a "sunset" date is established, and replacement technology is available, the FAA will be required to support these navaids.

FAA is currently allowing 10 years for dual operations of old navigation systems (very high frequency omnidirectional range, co-located with distance measuring equipment (VOR-DME), etc.) with new systems (GPS/ WAAS). Moreover, the 10 year "clock" will not start until WAAS is fully operational. Conversely, the Coast Guard is decommissioning Loran-C and Omega in favor of GPS with only four to five years total elapsed time from announcement to decommissioning. A more radical FAA approach would be to start the clock now, and allow only five years to complete transition. (This may be more feasible for certain avionics if WAAS is descoped.)

Moreover, GPS avionics could be developed faster and be less costly if FAA forced a 5-year instead of 10-year transition; there is a "chicken and egg" problem, since the market will not develop unless there is a firm termination date announced by FAA for old navaids. However, once announced, avionics marketers would act quickly to produce low-cost GPS receivers. Most experts believe full decommissioning cannot occur before 2008. Current planning is for a 2012 "sunset" date. Decommissioning all navaids is estimated to save approximately more than $150M per year.

1.3.1 Partial Decommissioning:

Decommissioning could take place in phases starting with LRRs, followed by VORs, NDBs, than ILSs. Decommissioning ILSs will require implementation of LAAS.

Enroute primary radar could be phased out more quickly than current FAA plans would allow, since they are no longer required once next-generation weather radar (NEXRAD) weather data is available to en route controllers.

LRRs are composed of both primary (raw) radars and beacon interrogators. Until the FAA and users move to Automatic Dependent Surveillance Beacon (ADS-B) or "equivalent", the beacon portion of the en route radar cannot be decommissioned. Decommissioning only the primary radar would result in both cost avoidance (no upgrades) and maintenance cost-savings. Annual

savings estimates are approximately $30M per year. (Note: For purposes of national defense, the primary radars around the peripheral of the United States, would not be decommissioned in the near term).

VORs, and NDBs could be decommissioned sooner if WAAS could either be accelerated or descoped and users could be "forced" to equip with compatible avionics for the FAA's proposed ADS-B) positioning system. Decommissioning all but the ILSs would result in savings of nearly $60M per year.

1.4 Private Sector Capitalization:

A potential savings vehicle, in the short term, would be for corporations to capitalize development and lease back services/equipment to the FAA. ARINC and other corporations have approached the FAA with these strategies. Allowing corporations to control development costs may reduce overruns often blamed on "requirements creep".

The new automation system for flight service stations, Operational and Supportability Implementation System (OASIS), will be procured by the FAA through a lease. This approach will significantly reduce up-front costs and share maintenance costs with other system users.

Additionally, the FAA has considered letting the private sector finance the continued modernization of the Oceanic Air Traffic Control (ATC) system. A possible approach might be for the FAA to develop the system specifications and let the private sector provide the financing for development and implementation. The Integrated Terminal Weather System (ITWS) is another system the FAA considered for private financing. Both these systems are projected to provide large savings to the user community but both will actually increase the FAA's operating costs. With constrained Operations funding, the FAA cannot afford to continue existing services and provide new services, especially when older systems cannot be decommissioned because of user equipage.

Issues: In many cases the FAA would enter into lease agreements where they may become completely reliant on contractors to provide maintenance. Additionally, the FAA may have to accept capabilities which do not fully meet "requirements" but that are capability increases to today's baseline.

- **Time Frame:** Near term
- **Up-front Investment Required:** None
- **Potential Savings:** $50M+/ year

1.5 Regional Restructuring: Consolidation of nine regional offices into three:

The FAA is structured into nine regions who have geographic authority for products and service ranging from air traffic control, various internal administrative support duties, to numerous types of certification. There is a lack of standardization for product and service delivery causing customers to "region shop" in many instances. Duplication and redundancies exist which are draining an already declining budget.

The FAA has conducted several studies and reviews on regional restructuring over the past few years. Participants ranged from regional administrators to work groups of mid-level managers chartered under the personnel reform program. To date, very few of the recommendations on regional restructuring have been implemented. In those cases where implementation has taken place it has been in those areas categorized as “low hanging fruit." As noted in the Coopers & Lybrand report, “FAA’s willingness to only pursue “quick hits” or to go after the “low hanging fruit” have had limited impact.”

Issues: While the total amount of up-front cost for a clean sheet approach may be hard to realize, the FAA should consider an implementation scheme that aggressively pursues both long and short-term goals for consolidation and integration of duplicative regional functions. The issue must be looked at from a service delivery/operational perspective and let those needs drive the structure.

Opposition is likely to come from various community and congressional sources when six of the regions are closed. Another obstacle will be the relocation of FAA personnel.

- **Time Frame:** Midterm
- **Up-front Investment Requirement:** Permanent Change of Station (PCS) cost for transferred employees, severance pay
- **Potential Cost Savings:** Approximately $400M through FY 02

1.6 Realignment and Consolidation of the Aeronautical Center and the Technical Center:
Consolidating the Mike Moroney Aeronautical Center (FAAAC) in Oklahoma City with the Technical Center in Atlantic City and other facilities would perhaps enable the FAA to reduce its overall operating cost through reductions in support staff.

The opportunities exist to phase out logistics and maintenance functions currently performed by the FAA to a contract-based operation. The FAA uses in-house resources at the FAAAC to perform many of its logistics functions including the provision of spare parts across the nation and the computer hardware maintenance operations for all the machines used in the NAS.

Phasing out hardware maintenance operations at the FAAAC and transition to contractor provided maintenance could save the FAA as much as $30M over the period FY 98-FY 04. These savings primarily come from reductions in training for maintenance personnel, shorter hardware life cycles requiring less maintenance over the life cycle of equipment and a transition to an Operational Command Center (OCC) concept of maintenance.

Phasing out the logistics operations at the FAAAC could save the FAA as much as $20M from FY 98-FY04. Studies conducted for the FAA by the MITRE Corporation from 1993-1995 illustrate that there is little control over the logistics functions. As a result, local facilities routinely store multiple back-up systems just in case there is an eventual need.

Contracting out the logistics function similar to the IBM contract for logistics services with Federal Express would give the FAA a much cleaner picture of the true costs of the logistics and maintenance functions associated with system repair and replacement. Using a contract based system would further enable the FAA to develop a preventive maintenance program that addresses potential weak spots.

The remaining functions provided at the FAAAC could be consolidated at the Technical Center and or moved to other FAA locations as well contracting out all training currently offered at the FAAAC.

Issues: Constraints: 1) Congressional interest
2) Relocation or reduction of personnel
3) Sale/transfer of real estate at FAAAC

- **Time Frame:** Midterm
- **Up-front Investment Required:** PCS, Severance
- **Potential Savings:** Potential savings of $135M over five years

1.7 Consolidate Air Traffic Services (ATS) Management and Oversight:

The Air Traffic and Airway Facilities activities under the ATS line of business currently maintain separate hierarchical management and oversight structures from the national headquarters all the way down to individual field facilities. There are two managers, two deputy managers, and two administrative divisions, with associated managers and staff, at each facility.

There is the potential for significant costs savings and improved decision making through the consolidation of the individual management and administrative functions into a single ATS structure.

Issues: The two organizations are almost completely autonomous in their current operations so achieving such a consolidation will require a significant culture change. Service levels could drop due to the turmoil of rapid reorganization and reductions-in-force.

There is likely to be resistance from lower-level employees as well (and possibly the unions) because there will be far fewer management positions available for promotions.

This consolidation is already being studied in ATS. No decision is imminent at this time.

- **Time Frame:** Near term
- **Up-front Investment Required:** Relatively high up-front costs for severance pay, lower if buyout authority can be obtained. If done over a longer period of time, the resulting staff reductions could be handled through attrition with fewer up-front costs and less disruption to the work force.
- **Potential Savings:** Assuming a total of 200 people-approximately $20M/year

1.8 Consolidate/Privatize Automated Flight Service Stations:

The FAA currently maintains a network of 60 Automated Flight Service Stations (AFSS) which provide pre-flight and in-flight aviation information (weather, notices to airmen (NOTAMS), etc.) and in-flight communications; receive/update VFR flight plans for pilots, perform search and rescue functions, and control visual flight rules (VFR) traffic for some nontowered airports.

Preflight briefings cost the FAA approximately $5.00-$9.00 per briefing. Providing the same briefings through the Direct User Access Terminal System (DUATS) leased system costs the FAA $1.50-$3.00 per briefing. Since its introduction in 1990, DUATS has provided a steadily increasing share of the number of flight service transactions.

Transferring preflight services (weather briefings/flight plan filings) to private industry would provide significant savings to the FAA. It would also allow for consolidation of the remaining AFSS functions (flight following, in-flight briefings, broadcast preparations, and search and rescue) into fewer facilities and closing the remaining AFSS facilities. The FAA could also save facilities and equipment (F&E) dollars by reducing or canceling the OASIS program.

Issues: Variations of this idea have previously been studied by FAA and rejected as too difficult to achieve. FAA experience has been that there is too much resistance to change in the general aviation (GA) community which translates into congressional pressure to maintain the status quo.

There will likely be resistance, as well, from the two controller unions, (NAATS) and NATCA. NAATS represents flight service controllers and will resist any effort to downsize staff. NATCA represents terminal and en route controllers and would be concerned about the possibility of flight service controllers "bumping" their members if subjected to normal "RIF" procedures.

- **Time Frame:** Near term
- **Up-front Investment Required:** Significant investment required for severance pay, termination and retermination of communications lines, and decommissioning of facilities. These costs would be offset by savings from operation and maintenance of the closed facilities and by cancellation of F&E projects.
- **Potential Savings:** Up to $200M/year

1.9 Accelerated National Airspace System Infrastructure Management System (NIMS):

Phase I of NIMS was recently approved. This program will make more efficient use of FAA's maintenance staff through remote monitoring of FAA facilities and strategically consolidating field maintenance offices.

Issues: Some questions remain regarding the cost effectiveness of outfitting older systems with remote maintenance monitoring (RMM). Sometimes the cost of sensors, and remoting data, can be more than a complete replacement system. For this reason, some argue that accelerating the NIMS program will have large up-front costs which will not be recouped.

The FAA is relying on NIMS as new systems are fielded. The savings will allow the FAA to field additional systems to meet capacity demands . In addition, NIMS will help absorb the dual maintenance required during transition from existing (legacy) to modern systems.

- **Time Frame:** Near to midterm
- **Up-front Investment Required:** Requires an accelerated investment of approximately $100M between FY 98-FY 02.
- **Potential Savings:** Estimated at $20M per year at current funding levels. Accelerated investment could double savings or offset would allow airway facilities (AF) staff to accelerate other system implementations.

1.10 Leveraging New ATC System Development:

For much of its modernization, the FAA could potentially reduce costs by engaging in joint development efforts with foreign countries. Additionally, the FAA could take advantage of ATC systems and standards developed by other countries. To some degree, the FAA is attempting to take advantage of foreign development efforts by promoting commercial off-the-shelf (COTS) acquisitions. The Host/EDARC replacement and advanced ATC functionalities will be an opportunity for the FAA to leverage investments.

Issues: Some would argue that the FAA's mission is far more complex than any foreign country's ATC environment. There are, however, similar problems faced by controllers and maintenance staff. The FAA will need to change its requirements generation process to capitalize on foreign developments.

- **Time Frame:** Near term
- **Up-front Investment Required:** Some process reengineering
- **Potential Savings:** $50M+/year

1.11 Peak Period Pricing:

ATC facilities are staffed to peak traffic flow. This causes under-utilization of staff during non-peak periods.

Peak period pricing is a concept which attempts to spread traffic flow more evenly throughout the day by providing cost disincentives during what are now peak travel times.

This potentially could allow the FAA to reduce the number of controllers now needed to maintain peak shifts and would keep controller "down time" to a minimum. It is also expected to increase controller productivity during off-peak shifts.

This concept requires further study to quantify the full time equivalent (FTE) and dollar savings.

Issues: Conceptually, this action might also allow the airlines to save money by reducing the number of airplanes needed through evening out passenger flow. They might also realize savings in flight crew and maintenance crew savings.

Recreational travelers will have the most flexibility in selecting travel times during the lowest cost periods. Business passengers will most likely oppose this type of pricing mechanism since they will be subject to higher ticket prices during the times most convenient for business travel.

1.12 Contract the Operation of Level 2 Air Traffic Control (ATC) Towers:

The FAA will complete a very successful program to contract out the operation of all Level 1 ATC towers in FY 98. When completed, this program will save approximately $28M in controller pay and benefits, annually, over the cost of federally owned and operated towers.

There is potential to achieve similar or greater savings through contracting the operation of Level 2 towers

FAA currently operates 106 Level 2 towers. The Air Traffic (AT) staffing standard provides an average of 13 controllers per Level 2 tower versus 10 controllers, average, per Level 1 tower. This would provide an estimated savings of $300 thousand per tower (versus $250K for Level 1s). This equates to annual savings of approximately $32M on a cumulative basis.

Issues: This option has been discussed at various levels within the FAA, but has not been pursued. The reason is that some in air traffic argue that there are many Level II towers that are instrument flight rules (IFR) and, as such, are part of the air traffic "system" and should therefore not be considered for conversion to contract towers. In reality, there are 71 VFR and 35 IFR towers. Assuming that the argument against contracting IFR towers is valid, $21M could still be saved, annually, by contracting the VFR Level II towers.

Note: The GAO is just beginning an audit of the contract tower program and will look at contracting all Level II towers as part of that audit.

- **Time Frame:** Near term
- **Up-front Investment Required:** Assuming that all Level II towers are contracted over a period of four years (as were Level I towers), approximately $40M would be needed for severance pay or for Permanent Change of Station (PCS) moves.
- **Potential Savings:** $21-$32M/year once fully implemented.

1.13 Special Pay Provisions:

The FAA has a number of unique pay components that augment base federal salaries, particularly for air traffic controllers. Examples include a 10 percent premium for training other controllers; a 10 percent premium for working in New York, Oakland and Chicago facilities; and an "Operational Responsibility" 5 percent premium because of employees' role in promoting aviation safety. Other premiums are not unique to FAA, but are instead available to federal employees in general, such as overtime pay, holiday pay, pay differentials for Sundays and nights, hazardous duty pay, etc. In FY 96, FAA spent over $245M on special pay, with 90 percent of this amount caused by Pay Differential-Operational Responsibility, Pay Differential-Nights, Pay Differential-Sundays, Holiday Pay, Overtime Pay, and Pay Demonstration.

Issues: Reining in these costs could provide substantial cost-savings. The Pay Differential - Operational Responsibility alone costs $90M per year. This differential was created by the Air Traffic Revitalization Act of 1981 with the intent of motivating and revitalizing ATC ranks after the PATCO strike. One could argue that the legislation has accomplished its purpose and the pay differential is no longer essential. In fact, rehired PATCO controllers are now receiving this differential. Better management of employees' schedules could lead to savings in overtime, holiday pay, night pay and Sunday pay, which together account for $140M each year.

- **Time Frame:** Near term
- **Up-front Investment Required:** More a question of leadership and cooperation than of funding.
- **Potential Savings:** Estimated at $90M per year, or $450M in FY 98-FY 02.

1.14 Staffing Standards:

FAA uses a process called staffing standards to estimate personnel levels needs for workload. The standards are mathematical models developed for five categories: (1) air traffic controllers, (2) airways facility maintenance, (3) safety inspection, flight standards, and aircraft certification, (4) civil aviation security, and (5) flight service stations. FAA headquarters uses the standards to allocate positions among the regions. In turn, the regions may, but are not required to, allocate staff to field locations according to the standards.

The Congress, Office of Management and Budget (OMB), GAO, Department of Transportation (DOT) Inspector General, and contractors have looked into FAA's staffing standards and found them to be outdated and deficient. In particular, the standards appear to lead to consistent overstaffing of air traffic controllers.

Issues: One possible result of revising FAA's staffing standards for productivity savings would be split shifts for air traffic controllers.

- **Time Frame:** Near term
- **Up-front Investment Required:** Funds to study alternative staffing models
- **Potential Savings:** If productivity within the air traffic controller work force alone were improved by 10 percent, the savings would be $21M/year, or $105M in FY 98-FY 02.

1.15 Contract-Out Virtually all Maintenance and Logistics Services:

A-76 comparisons of in-house vs. contractor performance of maintenance and logistics services would likely show that life-cycle contractor performance is cheaper, whether performed by the original equipment manufacturer (OEM) or by a third-party supplier with cross-vendor support responsibility. This is likely to be particularly true of site maintenance. Moreover, FAA is beginning to find it impossible to perform maintenance because of proprietary data it cannot get from vendors (i.e. drawings, source code, etc.), and the nature of new technology which makes local repair not feasible and economically unsound.

Issues: May require a significant reduction in the FAA maintenance work force. May lose expertise.

May require Permanent Change of Station (PCS) costs or severance pay for maintenance work force. NIMS (Phase 1) already funded; can be used by FAA or contractor work force. If transition is long enough and planning okay, no adverse attrition or layoffs to older AF technician work force.

Contract maintenance could carry some risk if a company were to go out of business or decided to stop supporting a particular product. U.S. air traffic control needs are unique, therefore some systems may have no international or commercial counterparts.

Additionally, FAA maintenance allows for cross training among various systems. With contract maintenance we may have multiple vendors supporting different systems. Both in-house and contract maintenance approaches have inherent economies of scale.

- **Time Frame:** Near to long term; need long enough transition from current AF technician work force to future contractor work force. Depends on human resource policy/union agreements or resistance.
- **Up-front Investment Required:** May require PCS costs or severance pay for maintenance work force.
- **Potential Savings:** Estimate 20 percent of AF operating costs today or more than $100M/year. Again, these "savings" may be applied to new functions requiring additional staffing (New functions include new systems and tools to meet capacity requirements and reduce delays).

1.16 Business Process Reengineering:

As stated in the Coopers & Lybrand report, "The FAA has had numerous reorganizations and changes in the headquarters and field relationships. However, it has not developed a consistent approach to reexamining its business processes to fundamentally improve them."

The FAA would benefit from reengineering and activity-based costing initiatives. These initiatives would identify those nonvalued added processes that currently waste time and valuable resources. Reengineering and activity based costing efforts at large government agencies typically reduce costs by at least 10 percent. The initiatives should also include developing measurements and benchmarking tools by which productivity improvements can be measured and best business practices implemented.

Additionally, the Congressional Research Service (CRS) Report for Congress on the Government Performance and Results Act, (GPRA) P.L. 103-62 submits that the GPRA is intended to encourage greater efficiency, effectiveness, and accountability within the Government by directing agencies to adopt new planning, budgeting, and reporting procedures. Because of anticipated obstacles and the need to change traditional procedures and budget reporting systems, Congress recognized that GPRA will require major changes in agencies' cultures and processes if it is to be successfully implemented.

Issues: By accomplishing business reengineering, the FAA will be able to identify wasted time in current processes. The FAA can then begin to assess the cost of doing business. Reengineering will serve as a foundation in the FAA's ability to recoup cost through a fee for service methodology and an accurate cost allocation system. To date, the FAA has not calculated the cost of a business reengineering effort.

GPRA legislation does not require agencies to provide performance plans or information until the first annual performance plan, due for FY 99. Nevertheless, the OMB has attempted to accelerate these requirements. No new funds are authorized to implement GPRA. It is likely that large amount of operating budgets will have to be devoted to GPRA as implementation continues.

- **Time Frame:** Near term
- **Up-front Investment Required:** Undetermined
- **Potential Savings:** Undetermined

1.17 Create "Just in Time" (JIT) Inventory System for Spare/Repair Parts:
Centralized storage of spare/repair parts, combined with air freight delivery, is much more cost-effective than distributed/local site storage. If FAA were to co-locate its depot with a major hub cargo carrier (FEDEX, UPS), it could substantially reduce the inventory size and the inventory carrying cost without a substantial impact on operational availability.

Issues: Same as 1.6 (Contract Maintenance).

- **Time Frame:** Near term
- **Up-front Investment Required:** JIT computer-based inventory system is needed , but should be a COTS product with modest costs. May require PCS or severance pay.
- **Potential Savings:** TBD

1.18 Gainsharing:
The Coopers & Lybrand report indicated that, "The FAA would benefit from a mandate created by the Administrator that addresses specific expectations for the Productivity Work Group. In the FAA's environment where redundancy is the rule, there are few incentives for managers to save money through productivity improvements. Managers question whether or not the risk to their department is worth the effort. For effective changes to take place, managers need positive incentives to initiate reform."

Gainsharing is a method to achieve the requirements necessary to provide, not only the managers but also every employee in the FAA, with incentives. Gainsharing developed in partnership with the unions could prove to be an excellent opportunity and provide the basis for long-term productivity improvements. It is important to give management and the work force the authority and the reason to reduce costs. To date, the FAA has not implemented any gainsharing programs.

Issues: The savings have not been calculated, however, a possible scenario is the potential for one third of the savings to the employees as either pay raises or a one-time cash payment, one-third to the managers of the organization to invest in future cost savings, and one third to the congress/treasury (users).

In order to develop a gainsharing model, the FAA must develop a system that shows the costs for doing business for example task by task. The FAA can then develop a matrix for measuring gains.

The personnel performance system may need changing in order to reward true participation that leads to gains and not performance of regularly expected duties.

Legislation is necessary in that under the current budget treatment all savings go to the treasury.

- **Time Frame:** Midterm
- **Up-front Investment Required:** Minimal
- **Potential Savings:** Goals set at 10 percent-20 percent of acquisition costs. Overlaps with other savings ideas.

1.19 Increased Attention to Workers Compensation Costs:

FAA's Workers Compensation costs totaled almost $78M in 1996. That figure has declined for the past two years and is now lower than the total in 1992. The number of workers compensation cases has remained steady--in the mid-to-low 3,000 range--since the 1980s. FAA's workers compensation costs totaled 0.9 percent of its overall costs in 1996, higher than the 0.7 percent devoted to workers compensation government-wide and 0.3 percent in a 622 data point sample of organizations across all industries. The majority--76 percent--of FAA's workers compensation costs are paid to air traffic personnel, with significant numbers of cases focused on stress and back problems. Over one third of FAA's workers compensation recipients are past the eligible age for retirement, and 78 percent of the cases are over 10 years old.

Issues: FAA, like all other Federal agencies, does not adjudicate the validity of workers compensation claims and cannot challenge a case accepted by the Department of Labor, nor can FAA switch disabled workers from workers compensation status to the less expensive retirement status upon age qualification.

FAA can, however, monitor the filing, payment and disposition of claims and may challenge a case before its acceptance by the Department of Labor. Some recent steps have increased the pressure on FAA to take advantage of this role: the FAA has begun to charge workers compensation costs back to the individual business units of the claimants, rather than account for them in a single general administration line item, and OMB in recent years has required agencies to absorb any workers compensation cost increases within their existing budgets, rather than support increased requests for congressional appropriations to cover these costs. FAA, with the help of a contractor, has begun to better monitor the validity of claims. Lines of business within FAA are being asked to identify positions that could be filled by their workers' compensation recipients.

- **Time Frame:** Near term
- **Up-front Investment Required:** Nominal. Some internal or contractor staff could increase monitoring of workers compensation claims.
- **Potential Savings:** If the FAA, through heightened challenge and monitoring efforts, could manage to bring down to the government-wide average the percentage of its budget devoted to workers compensation, it would realize an annual reoccurring savings of $17M (0.9 percent to 0.7 percent is a 22 percent reduction, and 22 percent of $78M is $17M). Even if the projected savings of $17M could be achieved by the end of FY 1998, those savings would not be realized until the FY 2000 budget. Thus, the accumulated savings over the three fiscal years 2000 to 2002 would be $51M.

1.20 Reform of FAA's Travel Costs:

Travel costs, including permanent change of station moves, totaled $154.6M in FY 1996, or $3,228 per employee, which is in the middle-high range of DOT modal administrations. A Travel Reform Task Force issued a report in June 1996, recommending 28 changes to travel procedures.

Issues: Many of the cost-savings would be squeezed out of Permanent Change of Station procedures and allowances. PCS itself, which is controlled by government-wide regulations, cannot be denied to eligible employees.

- **Time Frame:** Near term
- **Up-front Investment Required:** $1.09M
- **Potential Savings:** Savings are estimated at 3.8 percent of FY 96 actual travel expenditures. The savings amount to $5.91M annually, totaling $29.55M in FY 98-FY 02.

2. Cost Saving Ideas for Users:

The capital investment opportunities listed below provide benefits to users through reduced operating costs (fuel, etc.)*. Most of these ideas are part of the FAA's Capital Investment Plan today. The implementation time frame will depend on the FAA's available resources.

For the cost-saving ideas below, we have shown the likely impacts on costs and schedules for three possible funding streams:

1) Current Funding - represents the FAA's '97 appropriation and assumes an average yearly capital investment funds (F&E) of approximately $1.9B per year.
2) FAA Requirements - represents the FAA "official requirements" of approximately $59B in total funding over the 6 year period from FY 97-FY 02. The capital investment funding under this scenario was approximately $2.4B/year

* Note: *These systems may also reduce FAA operating costs.* The programs below all provide controllers with tools which will allow more efficient use of the airspace, saving users fuel and other operating costs. Many of these tools will also allow controllers to handle more aircraft without impacting safety. As a result, the controller workforce will be able to handle more operations without an equivalent increase in staffing.

3) Acceleration - represents potential acceleration of capital investments to meet recommendations of the Gore Commission. Aggregate costs estimates have not been completed.

The actual mix of programs at the funding levels above is dynamic. The FAA constantly struggles over the proper mix of investments to meet the needs of stakeholders, customers and its own budget constraints. The existing budget environment does not support FAA investments in some user-benefit programs which require *additional* operating and maintenance costs downstream. The FAA's operations budget is often capped independently of new user services.

In the FAA's Architecture -Version 2.0, the near-term focus was on modernization and "user-benefit" programs were initially deferred. Given the FAA's funding constraints, priority was given to programs which would sustain or replace infrastructure and mitigate projected increases in operating costs. Since that time, in response to much criticism from users, the FAA has accelerated some user-benefit programs. The accelerations will be at the expense of upgrading major infrastructure pieces like the Host computer. Version 3.0 of the Architecture is expected to be published in late 1997 and will contain the FAA's best effort of an optimal mix of capital investments.

It must be made clear that investments in infrastructure do benefit the users through reduced equipment outages which reduce delays. Even though FAA equipment outages are not currently a major driver of delays, many key components are reaching the end of their life cycle. The Display Control Channel (DCC) is an example of antiquated equipment, which when it fails, can cripple air traffic flow in an en route center. The DCCs are currently being replaced. Systems like the HOST computer and ARTS are also reaching the end of their life cycles and need to be replaced.

2.1 Accelerated Host/EDARC:

The Host/EDARC system is the backbone of the FAA's air traffic control system. It manages all ATC flight information within a center and manages the transfer of flight data both between en route Centers and TRACONs. The Host is the primary system and EDARC is the backup. The Host and EDARC are not planned to be replaced until 2005 under constrained funding levels. There is concern that the Host/EDARC should be replaced sooner for several reasons. First, the Host is on an antiquated hardware platform which IBM maintains solely for the FAA. Second, a replacement system for the Host/EDARC will be required as supporting infrastructure to some of the additional benefits described in other user benefit investment opportunities. Prior to Host/EDARC replacement, a subset of user benefits can be achieved. The Host/EDARC contains over a million and a half lines of software and serves as the backbone to the Air Traffic Control system. (e.g. all flight data processing and radar data processing). Host/EDARC is the platform for future enhancements.

Issues: With additional funding the Host/EDARC replacement could be accelerated thereby reducing the risk of system outages. Early replacement of Host/EDARC could also establish a common platform for new functionalities like Conflict Probe and the Center TRACON Automation System (CTAS). Delaying the Host/EDARC replacement would allow for

development of potential replacement segments required in a new Host to mature. The majority opinion in the FAA is that the Host replacement (development work) must begin immediately.

- **Time Frame:** Near to midterm

  Current Funding: Rehost partially funded as insurance without deployment; replacement in kind funding delayed until FY 00; Initial Capability 2005

  FAA Requirement: Rehost partially funded as insurance without deployment; concurrently replacement with minimal enhancements fully funded beginning in FY 99; Initial Capability 2004

  Accelerated: Rehost fully funded and deployed; Initial Capability 2002; concurrently replacement with full enhancements funding to begin in FY 98 and add additional capabilities for NAS Information System

- **Up-front Investment Required:**

	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02
Current Funding				10.0	68.2	173.4
FAA Requirement			10.0	68.2	173.4	115.5
Accelerated (ROM estimate)		50.0	100.0	150.0	150.0	150.0

- **Potential Savings to Users:** Not quantified*; serves as platform for future user benefit programs.

*Failure to replace the Host or EDARC systems could result in system outages. A Host outage results in significant delays to the airlines. In 1995, a two-hour outage in the en route automation system of the Chicago Center cost the airlines an estimated $12M in delays.

2.2 Accelerated Aeronautical Data Link (ADL):

Data Link will allow routine messages between pilots and controllers to be sent automatically. Improvements will include better pilot-controller coordination, fewer repeats or missed instructions, and reduced wait time for clearance. Benefits have been projected at nearly $500M/year but achieving these benefits will require other controller tools like CTAS and the Conflict Probe.

Additional benefits of Data Link may be achieved in the future when the FAA is able to provide real-time ATC data directly to the cockpit. Under this scenario, airplanes would begin to "self separate." In this later stage of free flight, pilots would have maximum flexibility and controllers may become monitors of the ATC system. Many technology advances will be required to achieve the "free-flight" concept of operation. Development and research will need to begin soon to put into place the infrastructure required. Many of the systems in the FAA's current architecture support the free flight vision. One area requiring more investment will be for the NAS Information System which would store national and international data from both the FAA and airlines in a central database (including situation displays, weather, forward route projections, enhanced flight plan 4-D trajectories, special use airspace, automated terrain, automated NOTAMS, etc.). This information would be accessible by pilots through data link

and would be updated throughout the route of flight. The FAA has just begun to analyze the requirements for this central database.

Cost and benefit estimates for a NAS Information System have not been completed.

- **Time Frame:** Far term
  Current Funding: Partially funded; Initial Capability with NEXCOM for en route Controller to Pilot Data Link Communications (CPDLC) (no FIS-Flight Information System))
  FAA Requirement: Additional Funding for early implementation of limited en route CPDLC over service provider; Initial Capability 2001 (one year after DSR)
  Accelerated: Accelerate for full CPDLC via service provider then NEXCOM; aggressively pursue additional Terminal and en route capabilities including FIS
- **Up-front Investment Required:** Approximately $300M; significant additional cost for the NAS Information System.

	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02
Current Funding	17.4	8.0	13.8	8.6	8.1	8.4
FAA Requirement	17.4	8.0	18.6	9.6	8.2	8.4
Accelerated	17.4	25.0	40.0	35.0	35.0	35.0

- **Potential Savings to Users:** Up to $500M/year; more under a "free-flight" environment.

2.3 Accelerated Oceanic Automation Program:

Program designed to decrease separation standards over Oceanic routes. Current separation is 100*100 miles. Reduced separation would greatly increase flexibility of routes. This program requires additional equipage by airlines for satellite data link of position information. The FAA will also require system upgrades.

- **Time Frame:** Midterm
  Current Funding: Funding for Build 1; hardware problems still an issue; limited improvement to today's oceanic service
  FAA Requirement: Funding for Build 1.5; includes replacement of aging system; achieves 50/50 separation (50/50 in 2001)
  Accelerated: Fully funds replacement of aging hardware; Achieves 30/30 separation; integrates with NAS Information System (30/30 in 2003)
- **Up-front Investment Required:** $60M-$120M + $500K per aircraft

	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02
Current Funding	38.0	32.0	11.0	23.2	2.0	3.6
FAA Requirement	38.0	32.0	29.0	5.2	2.0	3.6
Accelerated (ROM)	38.0	50.0	50.0	40.0	35.0	25.0

- **Potential Savings to Users:** $500M/year+ at accelerated funding levels.

2.4 Conflict Probe:

Decision-support tool for controllers. Includes automatic conflict detection and flight planning capabilities. Allows controllers to grant user preferred routes.

- **Time Frame:** Midterm
  - **Current Funding:** Continue support of prototypes; delay Full Scale Develop (FSD) funding in FY 99; Initial Capability 2002 (two years after DSR)
  - **FAA Requirement:** Begin funding in FY 99; Initial Capability 2001 (one year after DSR)
  - **Accelerated:** Accelerate and begin FSD in FY 98; Initial Capability 2000 (six months after DSR)
- **Up-front Investment Required:** $250M

	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02
Current Funding	4.7	6.6	5.8	53.8	62.5	45.1
FAA Requirement	4.7	31.2	51.8	70.3	45.4	31.5
Accelerated	12.5	46.5	69.5	62.8	36.7	13.7

- **Potential Savings to Users:** Potential of $150M+/year at accelerated funding levels. Implementation in 2001.

2.5 Center TRACON Automation System (CTAS):

Provides controllers with planning tools which make more efficient use of transition and terminal airspace through metering and final approach spacing. Supports maximum use of runways and fuel-efficient descents and departure climbs.

- **Time Frame:** Midterm
  - **Current Funding:** Fully fund TMA Single Center; delay funding for TMA Multi-Center for one year; delay funding for FAST until FY 01; delay STARS P3I 1 year (Initial Capability approx. 2005)
  - **FAA Requirement:** Fully fund TMA Single Center; increase funding for TMA Multi Center for 1 year; delay funding for FAST until FY 01; restore funding STARS P3I (Initial Capability approx. 2004)
  - **Accelerated:** Fully fund TMA Single Center, TMA Multi-Center, and FAST; accelerate STARS P3I; (Initial Capability approx. six months earlier)
- **Up-front Investment Required:** $100M

	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02
Current Funding	17.4	4.2	16.0	20.3	30.1	34.5
FAA Requirement	17.4	14.2	16.0	20.3	30.1	34.5
Accelerated (ROM)	17.4	24.2	26.0	30.3	40.1	44.5

- **Potential Savings to Users:** $50 - $200M/year.

2.6 Collaborative Decision Making (CDM):

Supports exchange of information between airlines and FAA Flow Control. Provides benefits to users.

- **Time Frame:** Near term
- **Up-front Investment Required:** $30-50M

	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02
Current Funding	3.4	4.6	9.6	16.4	18.0	15.3
FAA Requirement	3.4	4.6	9.6	16.4	18.0	15.3
Accelerated (ROM not available)						

- **Potential Savings to Users:** $100M year

2.7 Surface Movement Advisor (SMA):

SMA is currently being demonstrated as a prototype in Atlanta's Hartsfield Airport. The system provides airline "ramp" controllers and FAA tower controllers with runway demand projections that can improve the utilization of runways, sequencing departures, and airport taxi areas. In trial runs at Atlanta, departure time in que were estimated to have decreased by an average of two minutes with SMA.

SMA development is software intensive and requires site adaptation for runway configurations.

Issues: To date SMA has received more support from the airline ramp controllers than FAA tower controllers. SMA's effectiveness will be site specific. SMA has been low on the FAA's priority list because its effectiveness is limited to particular airports. The ramp controllers portion of SMA could be funded by the airlines based on projected effectiveness of the tool.

With the success at the Atlanta trials (FAA has not completed an independent assessment of the results), SMA could move up the priority list. Current planning has been for SMA to be part of a complete tower automation system. Today's ATC towers have numerous systems running on independent displays. The time frames below are based on SMA becoming part of a national tower automation system. It is possible that SMA, as a standalone system, could be implemented cheaper and quicker.

- **Time Frame:**
  Current Funding: Not funded
  FAA Requirement: Not funded before 2004; Initial Capability approximately 2008
  Accelerated: Pursue national capability on integrated tower display; Initial Capability approximately 2003
- **Up-front Investment Required:** $35M through FY 03 for 13 sites.

	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02
Current Funding	0.0	0.0	0.0	0.0	0.0	0.0

FAA Requirement	0.0	0.0	0.0	0.0	0.0	0.0
Accelerated (ROM)		5.0	10.0	10.0	5.0	5.0

- **Potential Savings to Users:** Approximately $15M/year if implemented at 13 sites.

2.8 Local Area Augmentation System (LAAS):
The LAAS system will provide high fidelity, high reliability positioning data from GPS for use in Category 1 through Category 3 landings. The LAAS system will allow for decommissioning ILSs at airports. LAAS will also allow for more efficient approach paths to airports.

Issues: To achieve a benefit from LAAS, aircraft must equip with new avionics and the FAA must decommission ILS systems. In the FAA's planning, funding for LAAS is assumed to come from the airports. The FAA will develop standards. Once developed, the cost of a LAAS system at a airport is projected to be under $1M.

- **Time Frame:**
  Current Funding: Development of standards funded, but full-scale development and deployment not funded (assume users/airports pay)
  FAA Requirement: Development of standards funded, but full-scale development and deployment not funded (assume users/airports pay)
  Accelerated: Development of standards funded; full-scale development and deployment fully fund beginning in 2000; Initial Capability 2002
- **Up-front Investment Required:** Development plus up to $1M per site plus the cost of avionics for aircraft (estimate not yet determined).

	FY 97	**FY 98**	**FY 99**	**FY 00**	**FY 01**	**FY 02**
Current Funding	6.0	6.5	2.7	2.1	2.1	
FAA Requirement	6.0	6.5	2.7	2.1	2.1	
Accelerated	Not available					

- **Potential Savings to Users:** TBD

3. Other Cost Saving Ideas

3.1 Work force Information Next Generation System (WINGS):
The FAA has embarked on an effort to modernize its automated personnel and payroll systems. The current, mainframe-based systems will be replaced with an integrated client/server-based system which will provide the flexibility that managers will require in order to hire and pay employees under Personnel Reform.

WINGS will also support the FAA's cost accounting effort by providing a simpler process for time collection and a comprehensive labor distribution system to facilitate costing of services.

- **Time Frame:** Near term

- **Up-front Investment Required:** Total investment cost for WINGS is estimated to be $39M.
- **Potential Savings:** WINGS is projected to save the FAA $15M/year once it is fully operational.

3.2 Integrated Terminal Weather System (ITWS):

Weather is the number one cause of delays for the airlines. ITWS provides airlines and FAA with integrated weather information including advanced predictions of thunderstorm, wind shear and front movement.

System will allow more efficient use of airspace during bad weather.

- **Time Frame:** Near term
- **Up-front Investment Required:** $200M

	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02
Current Funding	19.9	23.0	23.4	33.7	25.2	11.0
FAA Requirement	19.9	23.0	26.9	33.8	25.3	14.4
Accelerated (ROM not available)						

- **Potential Savings to Users:** Estimated $200M-300M/year

3.3 Aviation Safety Management Program (ASMPT):

ASMPT initiative is intended to provide an automated database driven safety risk management approach to continued operational airworthiness.

The Aircraft Certification Service safety management program aims to develop concepts, standards, and processes for the safety assessment and management related to design and continued airworthiness of aircraft, aircraft engines, propellers, and systems. The goals of this program are:

(1) Seek industry participation in program development;
(2) Assess the adequacy of existing FAA policies and procedures;
(3) Initiate appropriate research and development related to the management program;
(4) Investigate means to assess the impact on safety from a total system perspective;
(5) Specify data requirements and tools necessary for an effective safety management program;
(6) Identify training needs related to safety assessment principles, tools and databases.

Issues: The benefits of the ASMPT initiative include quicker, more cost effective methodology to analyze and discern the truly safety significant issues. The ability to more efficiently focus limited resources on the "critical few" issues will both reduce operating costs and enhance safety.

- **Time Frame:** Near to midterm
- **Up-front Investment Required:**

Year	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03
($K)	3119	4000	4922	4922	5100	5300	5400

- **Potential Savings:** Significant cost savings to society will be realized by transforming from a corrective approach to a preventive approach. A high-level of safety is necessary to ensure public confidence in aviation. An estimate of cost-savings/avoidance is not available at this time.

3.4 Accelerated Safety Performance Analysis System (SPAS):

Program will provide aviation inspectors with analytical and trend data, and real time history on aircraft and airlines including inspection frequencies and past problems.

- **Issues:** Will allow inspectors to focus their inspections on potential problem areas and therefore increasing effectiveness of inspections.
- **Time Frame:** Near term
- **Up-front Investment Required:** An additional $10M from FY 98-FY 02. ($20M identified at current funding levels)
- **Potential Savings:** The draft cost-benefit analysis indicates that the potential for a cost avoidance exists. The amount is being evaluated. The real dividends will be increased effectiveness of inspections with a potential for decrease in accidents or incidents. Inspectors will be able to increase their productivity with the use of automation. Accelerated funding would begin savings approximately one year sooner.