APPENDIX A
RESEARCH, ENGINEERING AND DEVELOPMENT ADVISORY COMMITTEE

The FAA values the ongoing involvement of the R,E&D Advisory Committee in reviewing its current and planned R,E&D programs. A formal process has been established whereby the agency replies to the Committee's reports. This document summarizes recent Committee recommendations and FAA responses.

FAA's R,E&D Advisory Committee and NASA's Aero-Space Technology Advisory Committee will continue joint meetings to establish a framework that allows FAA and NASA to communicate, coordinate, and manage their R&D goals in the areas of safety, efficiency, and environment and energy.

Since preparation of the 2000 *FAA National Aviation Research Plan*, the Committee submitted the following reports:

- Committee's Recommendations on Fiscal Year 2001-2005 R,E&D Investment Portfolio, dated June 11, 1999 (Updated FAA response-Sept. 1, 2000)
- Committee's Guidance on FY 2002 Budget, dated December 17, 1999 (FAA response-Sept. 1, 2000)
- Committee's Recommendations on Fiscal Year 2002-2006 Investment Portfolio, dated July 13, 2000 (FAA response pending)

In 2001, FAA expects to receive the Committee's recommendations on FAA's planned research and development investments for fiscal year 2003, including detailed recommendations from the standing subcommittees.

Also in 2001, the Committee will be receiving recommendations from two ad hoc Subcommittees: the Tiltrotor and Advanced Rotorcraft Technology in the NAS (TARTNAS) and the Small Aircraft Transportation Systems (SATS).

COMMITTEE'S RECOMMENDATIONS ON FISCAL YEAR 2001-2005 R,E&D INVESTMENT PORTFOLIO (DATED JUNE 11, 1999)

At the April 21, 1999, Committee meeting, the Committee reviewed FAA's planned FY 2001-2005 R,E&D Investment Portfolio and provided recommendations to FAA in a letter dated June 11, 1999 from Committee Chairman Mr. Robert Doll to Administrator Jane Garvey. The FAA provided an interim response at the September 14, 1999, Committee meeting and an updated response at the April 11, 2000 meeting. FAA provided a formal response by letter dated September 1, 2000. The recommendations and FAA's responses are provided below.

COMMITTEE RECOMMENDATIONS:

We recently concluded our first round of meetings for 1999 of the Research, Engineering and Development Advisory Committee and its Subcommittees. Another round of subcommittee meetings will be held between now and September 14, 1999 when we will convene our last REDAC meeting for this year. We hope that you will be able to attend the opening session of the September meeting when perhaps you could share your views on the Agency's progress in RE&D and particularly about free flight and its attendant programs.

We are now working with the appropriate people in NASA to assure the maximum coordination of our respective advisory committee efforts and RE&D programs we are charged to oversee. A coordinating committee composed of members of the REDAC and NASA's ASTAC has been formed for the purpose of coordinating the goals of the agencies. An initial meeting of the new committee will be held June 22 through June 24.

All of the concerns that have been underlying the REDAC's efforts for the past few years are still prevalent and, in fact, growing in many areas. Of particular concern is the continuing lack of funds appropriated to the FAA and NASA to support research for aviation and the shift of significant RE&D budget allocations to F&E accounts.

Not a meeting goes by without a discussion of the serious consequences of the continued under funding of the RE&D aviation budget. The comparative level of RE&D expenditures within the European Union continues as a topic of interest to the REDAC. The U.S. aviation industry produces hundreds of billions of gross revenue dollars annually and accounts for a large proportion of our foreign trade revenues. The percentage of the gross revenues that the U.S. aviation/aerospace industry spends on RE&D is scandalously small. The responsibility lies with both the government and the private sector.

If we do not pay attention to developing the systems, facilities and equipment needed to handle the growth that our economy demands of the air transportation system, the growth of our economy will be adversely affected. This is a very simple equation.

I understand from industry sources that a major new study of European aviation related expenditures, including RE&D expenditures, is about to be released. I believe that this report will show that the US continues to be dramatically outspent in absolute terms by the EU in all areas of aviation RE&D.

We face the very real prospect of losing our lead in air traffic management systems and standards and the related hardware that we have traditionally supplied to the global aviation community. The potential impact to our economy of the loss of industry leadership is difficult to estimate.

A visit by a high level FAA team will take place with European leaders this month. We understand that US interests are entitled by treaty to share in the results of European RE&D efforts. We need to take advantage of this right to access the RE&D work in Europe. We strongly support this meeting.

The idea that the portion of RE&D expenditures funding needed for facilities and equipment is not related to RE&D but to project implementation is a bad idea. Equipment and facilities acquisitions are an integral part of the RE&D process. To remove these expenditures from the RE&D budget incurs a high risk of the money disappearing from RE&D availability over the longer term. It is imperative that any RE&D funds that have been moved to the F&E Budget be effectively “fenced” for RE&D like activities.

In our eyes, the acquisition of facilities and equipment for RE&D outside of the purview of RE&D personnel is fraught with danger. We fear that the research requirements for specific features of that equipment could be lost on F&E acquisition personnel.

This is a major concern in the Airport Technology RE&D budget where all of the dollars were moved to F&E. What may not be apparent to the decision-makers is that the Pavement Test Facility is completed. There will be very little spending required on F&E in the future for Airport Technology RE&D. Therefore there is no rationale for having Airport Technology funding in the F&E budget.

The REDAC supports the FY 2001 RE&D budget as constructed by the roll-up of the individual RPD requirements. We believe that a strong effort to meet this funding level is required of the FAA before the GAO and Congress. We hope that the idea of Flagship Initiatives is pursued to provide a significant boost to FY 2001 funding.

The high-level budget requirements for FY 2001 were presented to us in our April meeting. The FY 2001 requirements and the comparable previous year request and authorizations appear in the table on the following page.

Category	FY 1999 Appropriation	FY 2000 President's Budget	FY 2001 RPD Requirements
Aircraft Safety	$ 34.9	$ 39.6	$ 60.0
Aviation Security	$ 51.7	$ 53.2	$ 66.3
Environ & Energy	$ 2.9	$ 3.5	$ 7.4
Human Factors	$ 25.1	$ 26.2	$ 29.7
R&D Management	$ 2.2	$ 2.7	$ 2.7
ATM	$ 90.9	$ 94.0	$ 132.2
Safe Flight 21*	$ 16.0	$ 16.0	$ 30.0
Airport Technology**	$ 5.0	$ 7.2	$ 10.0
CAASD ATM R&D***	$ 31.8	$ 35.8	$ 37.4
Total	$ 260.5	$ 278.2	$ 375.7

* FY 1999 Safe Flight Funds are in the F&E Account

** All Funding is in the F&E Account

*** Funds are provided from the RE&D and F&E Accounts

Congress has essentially mandated the level of the Aviation Security expenditure. The explicit Human Factors portion of the entire budget is significant and includes monies dedicated to Aircraft Safety and ATM RE&D projects. We would like to see more money spent in Human Factors but the practicalities of anticipated funding and mandates do not allow reallocation of money from other RPDs into the explicit Human factors efforts. We believe that industry must step up to supporting efforts such as Human Factors and Aircraft Safety to bring themselves more in line with the benefits they derive from those efforts.

The severe budget cuts proposed for NASA are truly alarming to the REDAC. The prevailing view in the industry is that NASA may need to be renamed NSA, dropping any reference to "Aeronautics" in their name if the present budget cuts are sustained. NASA's leaders have stated that they will eliminate efforts related to aeronautics in order to maintain their space program expenditures.

The REDAC believes that progress on aircraft engine emissions and noise-related research will be severely impacted as NASA is forced to wind down current research efforts. The cessation of funding for noise and emission research is not in the public interest. The FAA will be hampered in its future efforts to effectively certify new systems and to produce effective regulation for the air transport system.

Discontinuities in basic research can't be recovered. The simple fact is that, even if money could be transferred from the NASA research budget to the FAA RE&D budget, the money would not be effectively spent as the FAA is not equipped or staffed to accomplish basic R,E&D.

FAA RESPONSE:

Your first recommendation expresses a concern over lack of adequate R&D funding, which threatens the U.S. lead in Air Traffic Management (ATM). FAA shares the Committee's concern about the lack of adequate R&D funding compared to that within the European Community (EC) and its impact on U.S. leadership in ATM. Our overtures to the EC about sharing in the results of European R&D efforts have not been fruitful. EC programs require matching funds from European industry teams; therefore, results are held closely to provide a competitive advantage. It is unlikely that any EC funded results will be shared with the U.S. other than information made available to the general public. We will continue working with Europe on ATM technology through the FAA/Eurocontrol R&D Committee, which has already proven beneficial to the U.S. and Europe. The EC participates in this forum, providing us an avenue for exchanging information.

Your second recommendation expresses concern over the movement of programs from the R,E&D to the Facilities and Equipment (F&E) appropriation. Similarly, your third recommendation questions the rationale for moving the Airports Technology program from R,E&D to F&E. In FY 1999, Congress moved the R,E&D programs in Capacity and ATM Technology, Communication, Navigation and Surveillance, and Airport Technology from the R,E&D to the F&E appropriation. The FY 1999 Conference Report created the "Advanced Technology Development and Prototyping" budget item in Activity 1 of the F&E appropriation and allocated the former R,E&D items into this line item. The FY 1999 House Report stated the following:

"The Committee recommends $45,857,000 for a new activity, 'Advanced technology development and prototyping'. Previously these activities were budgeted in the Research, Engineering and Development (R,E&D) appropriation under activities titled 'Capacity and air traffic management technology' and 'Communications, navigation and surveillance'. The Committee believes that, because these activities fit closely with follow-on activities funded in F&E, management could be improved if they were funded together in F&E. These activities are funded at the budget request levels, except for the 'Flight 2000' project, for which no funds are provided. The Committee does not intend for this budget adjustment to change the authorizing committee of jurisdiction in the House, which has historically been the Committee on Science. For that reason these activities are recommended in a single new program, rather than dispersed throughout the F&E appropriation."

Congress made the decision to move these programs from the R,E&D to F&E appropriation, and FAA must follow the legislation resulting from that decision. Although the appropriation has changed, we have been able to manage the programs within the new line item. First, the programs within the new F&E line item are essentially the same programs that were under the former R,E&D line items. Second, the new line item has retained a consistent level of funding since the move, so the programs have not suffered from lack of funding. Third, we have modified and are continuing to improve our internal budget process for managing our R&D investment portfolio, which includes both the R,E&D and F&E Activity 1 programs. Finally, the Integrated Product Teams (IPT) have "cradle to grave" responsibility for programs. That means that an IPT manages a program from its initial research to its implementation. Therefore, the same personnel continue to manage these programs even though the programs have moved from the R,E&D to F&E appropriation, so there is no change in personnel or any loss of knowledge.

Your fourth recommendation points out the potential for FAA to share the results of the European Union (EU) R&D program. As your letter indicates, a high level FAA team met with European leaders in June 1999. FAA conducted a second, follow-up meeting with the European Commission (EC) in Brussels in October 1999. Dr. Aaron Gellman, a member of the R,E&D Advisory Committee at the time, attended the meeting. As a result of the meeting, FAA and EC agreed to share information from R&D efforts of mutual interest. Both organizations identified the crashworthiness area as a candidate program for further mutual cooperation. Since October, FAA and EC have shared specific program plans in that and other areas. Although FAA has shared R&D results with the EC, there are complications related to FAA accessing EC R&D results as mentioned previously. The EC restricts its R&D results through proprietary rights designations to protect industries within the EU and promote the global competitiveness of the EU throughout the world. This makes it difficult and often prohibitive for FAA, a U.S. Government agency, to access EU R&D results.

Your fifth recommendation provides approval for our FY 2001 R&D program. The table below [next page] provides the President's FY 2001 budget compared to the figures in your table, which show our total requirements in FY 2001. As shown in the table, the FY 2001 President's budget includes a total of $257.5 million for R&D programs in the categories listed, which include R,E&D, F&E and Airport Improvement Program (AIP) appropriations.

		President's Budget			
	FY 2001	FY 2001			
Category	RPD Requirement	R,E&D	F&E	AIP	Total
Aircraft Safety	$60.0	$49.4			$49.4
Aviation Security	66.3	49.4			49.4
Environment & Energy	7.4	7.4			7.4
Human Factors	29.7	25.1			25.1
R&D Management	2.7	1.3			1.3
ATM	132.2	41.2	$40.8		82.0
Safe Flight 21	30.0		25.0		25.0
Airport Technology	10.0			$7.4	7.4
CAASD ATM R&D	37.4	5.0	*32.4		37.4
Information Security		5.5			5.5
Total	$375.7	$184.3	$65.8	$7.4	$257.5

* Total of $63.4M in F&E for CAASD in FY 2001 President's Budget

Your sixth recommendation indicates concern over the alarming cuts in the National Aeronautics and Space Administration (NASA) budget. We have forwarded the Committee's concerns to the NASA Associate Administrator for Aerospace Technology. As you know, FAA and the U.S industry is critically dependent on NASA research in several areas, including aircraft engine emissions and noise. FAA has strongly supported NASA's environmental research to the Office of Management and Budget (OMB) and Congress. It appears that some of NASA's environmental research funding is now supported by Congress and may be increased in FY01.

Your comments specifically address concern over the lack of funds for NASA engine emissions and noise-related research and the impact of this on FAA's ability to effectively certify new systems and produce effective regulation for the air transport system in the future. This is a difficult issue because of evolving priorities within the executive and legislative branches of the U.S. Government. As you know, the NASA Advanced Subsonic Technology (AST) and High-Speed Research (HSR) programs were terminated in FY 1999. However, a new NASA Quiet Aircraft Technology program has begun in FY 2000 as a result of Congressional action, and it is planned to continue that effort in the President's FY 2001 budget request. New emissions work has also begun in FY2000 within the NASA Ultra Efficient Engine Technology program. Both new programs are currently included in budget plans through FY 2005. These programs are currently funded at lower levels than the earlier AST and HSR programs and will not develop technology at the same rate or to the same high readiness levels. This is a concern that must be addressed by the entire aviation community, and we are not convinced that the program priorities as evidenced by projected funding levels are entirely appropriate to meet the real needs. To help lead the necessary discussion, the FAA and NASA have requested the National Research Council (NRC), through its Aeronautics and Space Engineering Board, to assess whether appropriate research policies and sufficient programs are in place to foster technological improvements that ensure environmental constraints do not become a significant barrier to growth of the aviation sector. The final report of this respected authority will likely be available in about two years, and we hope that R,E&D Advisory Committee will closely follow the NRC deliberations in the meanwhile.

COMMITTEE'S GUIDANCE ON FY 2002 BUDGET (DATED DECEMBER 17, 1999)

Each year in September, the Committee provides recommendations on how the FAA should invest its R,E&D funds. The Committee provided guidance on FAA's FY 2002 budget in a letter to the Administrator dated December 17, 1999. The Committee received a formal response by letter dated September 1, 2000. The recommendations and FAA's responses are provided below.

COMMITTEE RECOMMENDATIONS:

At the meeting, NASA made a most effective presentation on their concept of a Small Aircraft Transportation System (SATS). We feel that SATS has potential as a significant new opportunity to increase air transport efficiency. It is evident to the REDAC that SATS will provide many new challenges for the FAA in the next decade that must be met if the program is to mature from the NASA research phase. Funds will be needed to begin RE&D work in the FAA. NASA's Gen. Sam Armstrong informed us that the FAA/ NASA Executive Committee wishes to study SATS further, since aspects of the SATS program are not yet defined. We approved an ad hoc group to work jointly with NASA on the developing SATS program and to review a Transportation Research Board (TRB) charter. The ad hoc group has been busy organizing a joint meeting with NASA to be held on January 18, 2000.

Our techical discussions centered on the continuing problem of funding the research and development of critical aeronautics initiatives. Of continuing priority are the programs that are critically needed to meet the rapidly growing demands for air travel that sorely taxed the system this past summer. The problems that were experienced by air travelers are the classic symptoms that arise when a server system is reaching its true capacity.

Several ideas were discussed as to how, as individuals, we might help deliver a message of the REDAC's deep concern regarding aeronautics R&D funding to Congress and to the Administration. We concluded that it would be most effective to carry the message back to the organizations represented by the members of the REDAC. We agree that the FAA and NASA should charter a "blue ribbon" group from the National Research Council. This group would solicit and synthesize the views of all of the stakeholders. The result will be a consensus vision of the civil aviation system of the future. They would be tasked to make a first order estimate of the resources required to enable this vision. With this NRC report, the FAA and NASA would have a basis for their individual budget requests for the next several years.

In October the REDAC Air Traffic Services (ATS) Subcommittee and the NASA ATM Executive Steering Committee held a joint meeting. Based on the information received at the meeting, the ATS Subcommittee sent a letter on December 10 to Steve Zaidman recommending that the FAA should become more involved with NASA's ATM efforts at all levels of the FAA but particularly at the top levels of the organization. Involvement must include the FAA's operational organizations as well as the Research and Acquisition organization. Top level involvement is necessary to support funding for NASA's aviation program with the Congress and the Administration. Of equal importance is the harmonization of the FAA's implementation capabilities with the NASA program to assure NASA's resources are used most effectively. We urge that you support Steve Zaidman in this effort.

The REDAC reiterates that the system capacity issue involves more than just the efficient use of the airspace. Unless airport facility issues, ground handling issues and noise and emission issues are pursued with equal vigor, the system will not be able to meet traveler's demands in the very near future. The frustration that the REDAC finds is that there are not any funds visible in other areas such as human factors, security or aircraft safety that could be reallocated without affecting critical programs in those areas. With the looming phase out of the current NASA noise and emissions program, it becomes ever more urgent that Congress and the Administration understand that these issues are real and need a bipartisan solution.

FAA RESPONSE:

Your first recommendation is that we apply funds to begin R&D work on the Small Aircraft Transportation System (SATS). As you mentioned in your letter, SATS is a National Aeronautics and Space Administration (NASA) research program. Currently, FAA is working with NASA through the FAA/NASA Executive Committee to determine an appropriate and achievable level of participation by the FAA in the SATS Program. Although we do not have contract funds assigned to SATS in our FY 2000 or 2001 programs, we do have personnel working on planning efforts related to SATS and are working to include contract funds for SATS in our FY 2002 R,E&D budget. However, like all federal agencies, FAA must operate within budget constraints; therefore, we cannot assure you that this effort will move forward in our FY 2002 budget. We can assure you that we are monitoring the NASA SATS program and working to accommodate it to the extent that our resources allow.

Your second recommendation is for FAA and NASA to charter a Blue Ribbon panel from the National Research Council (NRC) to develop a consensus vision of the civil aviation system of the future. We appreciate your support in our effort to work with NASA to formulate the Aerospace Transportation System After Next, with an objective to define the aerospace transportation system required in the years 2020 to 2050. We expect to use the result to plan future research efforts. At your April meeting, I presented our proposal to work with NRC on this effort. As we discussed at the meeting, we plan for REDAC along with the NASA Aero Space Transportation Advisory Committee (ASTAC) to lead a large part of the effort. We appreciate your approval to form a joint task force with the ASTAC to guide the vision development process.

Your third recommendation addresses the need for all levels of FAA, and particularly top-level managers and operational organizations, to become more involved with NASA's Air Traffic Management (ATM) efforts, with a focus on harmonizing FAA's implementation capabilities with the NASA program. We agree with your recommendation. We believe that having more involvement at all levels in the operational organizations would improve the harmonization of the R&D and its implementation. However, the operational side, in particular, requires Operations and Facilities and Equipment (F&E) resources to participate. This is a challenge, because resources in these budgets are limited. New requirements must compete with very high-priority operational and NAS modernization programs. One area where we are working to identify increased NASA and operational organization involvement is Free Flight Phase 2. Although planning is still underway, the structure will clearly identify increased involvement between NASA and FAA operational organizations. We consider this an important step toward increased harmonization.

Your final recommendation expresses concern over lack of funding designated to address noise and emission issues, which if unresolved could constrain future growth of the aviation system. We are working to increase our Environment and Energy program. In the FY 2001 President's budget, we more than doubled our request for Environment and Energy from the $3.4 million received in FY 2000 to $7.4 million. Most of this increase is in the noise area, which supports our rulemaking, standards setting, and modeling to assess noise impacts. Although the FY 2001 appropriations process is not complete, both the House and Senate have indicated the amount will be close to that provided in the current year. Thus, we will not likely be able to enhance our Environment and Energy program as you have advised.

COMMITTEE'S RECOMMENDATIONS ON FISCAL YEAR 2002-2006 R,E&D INVESTMENT PORTFOLIO (DATED JULY 13, 2000)

At the April 11-12, 2000, Committee meeting, the Committee reviewed FAA's planned FY 2002-2006 R,E&D Investment Portfolio and provided recommendations to FAA in a letter dated July 13, 2000 from Committee Chairman Mr. Robert Doll to Administrator Jane Garvey.

COMMITTEE RECOMMENDATIONS:

The majority of the REDAC supports the requirements shown in the table below. Some members of the committee feel that the sub committees are not given enough detail to make such a decision. We are working on procedural changes to assure that all of the sub committees feel comfortable with the depth of information they receive. We believe these funding levels accurately reflect the appropriations required by each line of business to advance its programs and achieve important goals.

These include the strategic plan goals of safety, security, and efficiency as well as the enabling environmental goals.We note the disparity between the requirements and the Office of Management and Budget (OMB) target level funding. The OMB target falls significantly below the required funding level. Therefore, we strongly support an effort by FAA to develop Flagship Initiatives to supplement the OMB target level funding in order to bring it closer inline with the required funding level. We believe a strong R&D program is essential to our future aviation system, and the required funding level is a step toward strengthening the R&D program that will contribute to achieving the goals of your strategic plan.

The majority of the committee endorses the "Aviation System After Next" effort to develop a longer-term vision for the aviation system beyond the year 2020. The FAA and the National Aeronautics and Space Administration (NASA) propose it as a unified effort including government and private-sector stakeholders led by a joint working group of our Committee and the NASA Aero Space Transportation Advisory Committee (ASTAC). Currently, we are participating with the NASA ASTAC to develop a plan for accomplishing this effort. We feel that it is our responsibility to ensure that future generations of Americans will have the quality of life and economic prosperity that the current national aviation system affords our generation today. A minority of the committee felt that this effort was too far reaching and could not produce meaningful results. They felt the industry would be better served with an effort to better define what comes after Free Flight I/II before efforts are spent going beyond 2020.

We support the congressional direction under the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (AIR-21) to create a Chief Operating Officer (COO) for the air traffic control system, appointed by the Administrator and reporting directly to the Administrator. We believe that this action is long overdue and have been recommending it for some time now. In April 1997, we presented our National Airspace System (NAS) Air Traffic Management R&D report to Acting Administrator Barry Valentine. One of our primary recommendations in this report was to establish a Deputy Administrator position responsible for the air traffic control system – including the creation, operation, and maintenance of the NAS but not the regulatory obligations. As we said in our 1997 report, the new COO will help breakdown the walls between the engineering and operational organizations and, thereby, focus the necessary actions to achieve a successful NAS. Therefore, we support this important initiative.

Program Area	FY 2002 Requirement ($M)	FY 2002 OMB Target ($M)	Delta ($M)
Aircraft Safety	78.6	66.0	12.6
Aviation Security	92.8	50.2	42.6
Environment & Energy	7.7	7.7	--
R&D Management	2.5	2.5	--
Information Security	10.5	5.5	5.0
Air Traffic Systems	164.8	128.6	36.2
Safe Flight 21	45.0	25.0	20.0
Airport Technology	10.0	7.5	2.5
TOTAL	411.9	293.0	118.9

We recommend separating the aviation security R&D program from the balance of the R&D program, because its requirements are so demanding that it is draining funds from the remaining R&D program. In the next decade, the aviation security program will require several billion dollars to achieve the zero-tolerance goals established by both Congress and the White House. This puts a tremendous financial burden on FAA as the sole agency responsible for fighting terrorism in our aviation system, because significant increases to the R&D budget to accomplish this mission have not been forthcoming. As the security portion of the R&D budget has increased, the total R&D budget has declined.

This has exhausted the balance of FAA's R&D program including air traffic systems, airports, aircraft safety, human factors, and environment and energy. Furthermore, the trend threatens to continue over the next decade unless something is done to correct it. We do not believe the security program goals are unimportant. Our citizens should expect to travel safely in our aviation system. They also should expect to travel in a timely fashion, but the security program alone does not provide these services. There are other efforts within the R&D program that contribute to safety and efficiency. Therefore, we recommend segregating the aviation security R&D program from the balance of your R&D program to protect the continued existence of these programs.

Although we support the goals of the environment and energy program, we believe the program is grossly under funded and may not meet its goals at current funding levels. I have asked Mr. James DeLong, Chairman of our Subcommittee on Environment and Energy, to investigate and report on this issue in more detail. In the meantime, I would like to share some of the subcommittee's preliminary findings. FAA invests $7.7 million per year in its environment and energy program. This is grossly out of proportion to what the rest of the community spends each year. For example, Louisville spent an average of $75 million per year for 10 years to expand its airport. A large part of that expenditure was related directly to environmental concerns, primarily noise. Compare FAA's $7.7 million to Louisville's $75 million: that is one airport and one investment. It seems out of proportion. Denver built a new airport for no other reason than environmental concerns, specifically noise and emissions. The price tag was $4.5 billion. In the first year, Denver violated noise restrictions with fines of $35 million for that year alone. These were levied as landing fees, which resulted in higher airfares. We all pay when airfares increase. Studies show that a 10 percent increase in airfares results in a reduction in air travel by as much as 27 percent. That is quite an elastic demand curve compared to automobile travel, which reduces only 2-3 percent for a 10 percent increase in gasoline prices. When air-

fares increase, the economy suffers and so does our quality of life.

Another example is Seattle Tacoma, which plans to build a new runway to access the Far East. It should cost $60 million, but it probably will cost $300 million after addressing environmental concerns. These concerns include relocating 10 acres of wetlands and 700 homes and businesses; sound proofing historic sites, schools, and 170 homes; and using staged construction due to environmental restrictions, which will delay completion of the project, thereby, increasing cost.

Historically, the FAA has set aside about 12% of its annual airport budget for noise abatement or mitigation. This will amount to $300 million in FY 2002. This type of expenditure will continue for the foreseeable future for sound proofing and acquiring homes. As stated above, the $7.7 million allocated to environmental and energy research programs pales in comparison. The Subcommittee on Environment and Energy will consider a detailed recommendation at their next meeting for the FAA to fund a feasibility study for the development of a "green" engine focusing on how some of the abatement funds might be better directed toward a potential solution to the noise problem rather than building ever larger buffer zones.

Environmental impacts extend beyond our national borders. They threaten our global competitiveness. Europe is attempting to eliminate acoustically treated aircraft from operating in Europe. This action would restrict our aircraft from that market. The FAA's environmental R&D provides the regulation, certification, and policies that the industry needs both in the U.S. and worldwide. We recommend more funding for environment and energy, because we see it as perhaps the greatest inhibitor to the growth of our industry.

We want to direct your attention to the fuel problem facing general aviation. There is a worldwide trend to phase out leaded general aviation fuel. The European Union plans to ban leaded fuel after 2005. We believe that the effort to find a replacement for leaded fuel will require R&D funds of $4 million in FY 2002. Current general aviation fuel supplies are drying up and represent such a small percentage of the petroleum industry that the industry may stop producing it. These factors drive the need for alternative fuels for general aviation.

However, new fuels require new engine technology, and this requires retrofitting the fleet with new engines, which could take 30 years or more. There is compelling need for an alternative fuel that is transportable, adaptable to the existing fleet, and available in large quantities. Without it, we risk losing general aviation. Without it, we risk losing the primary training-arena that feeds pilots to the regional and commercial fleet. Without it, we fear fatalities as aviators attempt to use unapproved alternative fuels. Therefore, we recommend $4 million in R&D to upgrade the FAA research lab that certifies general aviation fuels. One of our members describes the current facility as shockingly archaic.