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Resources, Community, and
Economic Development Division

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The Honorable Glenn M. Anderson
Chairman, Committee on Public Works and
Transportation
House of Representatives

The Honorable Norman Y. Mineta
Chairman, Subcommittee on Surface Transportation
Committee on Public Works and Transportation
House of Representatives

The Honorable James L. Oberstar
Chairman, Subcommittee on Aviation
Committee on Public Works and Transportation
House of Representatives

As requested, we are providing information on the status of the Federal Aviation Administration's (FAA) West Coast Plan and related environmental and management issues. The Plan is a major effort to increase airspace capacity, reduce flight delays, and enhance air safety in the western United States. Specifically, we are providing information on

- changes in procedures and air routes FAA is contemplating, the time period over which FAA expects to implement the West Coast Plan, and the cost of these changes;
- FAA's plans to involve the public in any changes it proposes and the status and/or results of any environmental assessments FAA has made or is making related to new air routes on the West Coast;
- the status of FAA's discussions with the Department of Defense (DOD) for new routes and flight procedures through airspace assigned to the military; and
- the effectiveness of FAA's overall management of its West Coast Plan.

Results in Brief

For the 10 projects comprising FAA's West Coast Plan, we found the following:

- FAA has completed three projects and plans to implement the other seven by late 1994. As the projects are completed, FAA expects to make some air route changes, particularly after 1994, when final improvements to Los Angeles airspace have been completed.

- FAA's November 1988 environmental assessment of a proposed change to a Long Beach Airport departure procedure did not appropriately take into account Council on Environmental Quality (CEQ) regulations, which require that alternatives to the proposed action be discussed briefly and that the public be involved in the assessment to the extent practicable. FAA officials said, however, that field personnel would be made better aware of environmental considerations and that the public would be involved in future environmental assessments of airspace changes.
- After 2 years of seeking solutions to airspace problems, FAA and DOD have reached agreement on some proposals for more effective commercial use of military airspace, but work on other proposals has been temporarily suspended. To facilitate progress in their discussions, FAA ceased managing West Coast Plan projects as a coordinated group and began managing each project independently.
- Project management was not as effective after FAA began managing the Plan's projects independently. We found instances of potential procurement redundancy, ineffective communication, and insufficient emphasis on project accomplishment to ensure timely completion.

Background

In 1985, FAA identified the West Coast states as an area in which air traffic management needed improvements. Two major, interrelated problems were (1) costly delays caused by air traffic congestion and (2) greatly increased growth in air route traffic, which created congestion. Through its West Coast Plan, FAA intends to accommodate this growth by making airspace and equipment changes that it believes will reduce delays, relieve airspace congestion, and lessen controller work load.

To oversee development of the plan, FAA formed a steering committee. During 1986 and 1987, steering committee work groups, composed of members from FAA, the airline industry, and the military, identified problems and proposed solutions, many of which have been adopted.

The location and use of "special use" airspace surrounding the Los Angeles basin significantly contributes to the Los Angeles area's air traffic congestion and complexity.[1] FAA assigned the special use airspace to the military for training purposes as long ago as the 1940s; within its airspace boundaries, flight restrictions may be imposed on aircraft not participating in the training. FAA attributes other Southern California air traffic control problems to an inadequate air route structure, much of

[1] Airspace Use: FAA Needs to Improve Its Management of Special Use Airspace (GAO/RCED-88-147, Aug. 5, 1988).

which the agency believes could be remedied by installing new ground-based navigational aids.

The West Coast Plan is FAA's second set of airspace changes in recent years—the first was the Expanded East Coast Plan, most of which was implemented in February 1987.[2] While this plan relieved flight delays at New York area airports, it also resulted in significant public controversy over aircraft noise. FAA plans to make additional airspace changes of this kind and magnitude in other parts of the country. A "mid-continent" plan to increase airspace capacity in the Chicago/Detroit/Cleveland area and throughout the Midwest is being considered, and other efforts have been proposed in other areas of the country, including Florida and the Dallas-Fort Worth and Boston areas.

Ten Projects Being Implemented

West Coast Plan projects involve installing new navigational aids, enhancing the efficiency of FAA-controlled airspace in the vicinity of airports in the Los Angeles basin, establishing new high-altitude air routes in the western United States, and increasing arrival capacity at San Francisco Airport. Several of the proposed routes involve expanding the existing civil air corridors into military airspace. After completing projects to enhance the airspace around airport terminals in the Los Angeles area, FAA expects to establish additional high-altitude, arrival, and departure routes in the area.

FAA estimates the total West Coast Plan cost to be about $143 million. Of this amount, four projects account for about $138 million. This includes one project to consolidate several air traffic control facilities in the Los Angeles area into a single facility estimated to cost about $112 million.

Project implementation has been staggered: three projects are complete, others are now being implemented, and implementation of others—in particular, the facility consolidation in Los Angeles—will not be complete until 1994. (App. I summarizes the purpose, cost, expected environmental impact, and status of the projects; app. II provides additional details on each project.)

[2]Aircraft Noise: Implementation of FAA's Expanded East Coast Plan (GAO/RCED-88-143, Aug. 5, 1988).

Potential for New Air Routes After 1994 Focuses Attention on Environmental Assessments

The National Environmental Policy Act of 1969 (NEPA), as amended, requires a comprehensive analysis of the environmental consequences of major federal actions as part of each federal agency's decision-making process. Council on Environmental Quality regulations implementing NEPA permit federal agencies, such as FAA, to prepare an environmental assessment before determining whether a proposed federal action will require a detailed Environmental Impact Statement (EIS) or will have no significant impact on the environment (a Finding of No Significant Impact (FONSI)). CEQ regulations require that an environmental assessment involve the public, to the extent practicable, and briefly discuss the need for the proposal and alternatives considered. The regulations also permit FAA to categorically exempt certain types of actions from any environmental review if the actions do not normally cause a significant environmental impact. For example, FAA Order 1050.1D uses this authority to categorically exempt flight routing at or above 3,000 feet, but the order stipulates that if a change is likely to be "highly controversial on environmental grounds" or to "have a significant impact on noise sensitive areas," it "shall be the subject of an environmental assessment."

First Environmental Assessment Related to West Coast Plan Did Not Take NEPA Regulations Into Account

Under Order 1050.1D, FAA made an environmental assessment of a proposed flight procedure change at the Long Beach Airport as part of the West Coast Plan. The assessment resulted in a FONSI, allowing the changes to take place without further study. FAA regional officials did not appropriately take into account CEQ regulations applicable to such assessments. These regulations require that FAA involve the public, to the extent practicable, and that the assessment briefly discuss the alternatives to the proposed action. As a result, the Long Beach environmental assessment was inappropriately abbreviated and the FONSI may have been based on incomplete information.

Regarding public involvement, FAA regional officials did not believe it necessary to involve the public in an assessment that was expected to result in a FONSI. However, a FONSI is the end result of a complete environmental assessment, not an alternative to it. We believe that in this instance one of the essential ingredients for an informed assessment was missing because FAA regional officials did not have the benefit of the public's views.

In describing the proposed revision, the assessment did not provide information regarding the geography the revised procedure would cause aircraft to traverse, the altitudes to be flown, or the estimated changes

in noise levels that would occur along the proposed route. Although the assessment discussed one alternative to the proposed procedure in terms of safety differences, it did not compare, on an environmental basis, alternatives as called for in CEQ regulations.

Finally, FAA field staff did not request headquarters assistance in preparing or reviewing this assessment. Although it is not specifically required by FAA Order 1050.1D to review environmental assessments, FAA's Office of Environment is responsible for, among other matters, overall review of FAA's environmental policies and procedures, including ensuring compliance with NEPA and evaluating activities to implement the act, one of which is the preparation of environmental assessments. However, the Director of the Noise Abatement Division in the Office of Environment said that FAA's Western-Pacific Regional Office did not provide him or others in his division opportunity to review the assessment because no agencywide guidance specifies how the regional office should seek review of an assessment. Moreover, FAA officials refer to another paragraph in FAA's Order 1050.1D, which states that "findings of no significant impact" shall be reviewed by pertinent field level staff and program offices and may be approved by the regional or center director or their representatives.

Nevertheless, Office of Environment officials believe that a review of the assessment by headquarters staff more familiar with environmental issues and NEPA provisions would have highlighted the assessment's deficiencies. This also would have increased the likelihood that the assessment included a more complete description of the proposed procedure change and provided for public involvement, as intended by NEPA. Environment officials also told us they would make field personnel more aware of environmental considerations and of the need to involve the public in future assessments.

Additional Environmental Assessments Will Be Needed If Controversy Is Expected With New Routes

The two West Coast Plan projects that could result in route changes in the Los Angeles basin—the Southern California Terminal Airspace Realignment (STAR) and the Terminal Los Angeles Basin Service (T-LABS)—could also increase traffic volume on existing routes in the Los Angeles basin. FAA does not know at this time, and will not know until after T-LABS is complete in 1994, how many new routes or what additional air traffic volume, if any, could result. An environmental review of any proposed airspace changes will need to be done at that time.

Once it is determined that an environmental assessment should be prepared, all of the NEPA regulations concerning such an assessment should be appropriately taken into account, including public involvement in the assessment process. FAA's environmental review of the Expanded East Coast Plan determined that an assessment was not needed because the new routes were above the 3,000-foot threshold. Because of this plan's broad scope and the strong public opposition to it, we concluded in an earlier report that FAA would have acted more prudently if it had prepared an assessment.[3] Moreover, involving the public in the assessment process would have provided FAA with more comprehensive evidence of the environmental effects of its plan and an evaluation of possible alternatives to the proposed route changes.

Stalled Problem-Solving Between FAA and DOD

FAA is authorized to develop plans and policy for using airspace and to assign airspace use under conditions deemed necessary for efficient airspace use. Moreover, although FAA has assigned certain portions of airspace to DOD to use for national defense purposes, under Public Law 85-726, FAA can revoke such assignment when it is required in the public's interest. In practice, however, FAA respects DOD's national defense mission and economic investment in facilities, especially in the southwestern region of the country. Thus, discussions regarding FAA's access to special use airspace typically resemble negotiations between two parties with significant interests in the outcome.

After more than 2 years of identifying problems, proposing solutions involving special use airspace, and negotiating alternatives, DOD and FAA have resolved some, but not all, important points of disagreement. DOD officials say that FAA has neither presented a convincing case for greater commercial access to military airspace nor adequately recognized the potential cost to the military of relocating its test ranges to accommodate commercial air routes through currently restricted airspace. Also, DOD will need to review FAA's most recent delay analysis to more fully understand the benefits to commercial carriers from gaining this access.[4] To enable discussions with DOD to occur on a case-by-case basis, thereby facilitating agreements, FAA removed the "West Coast Plan" label from its set of projects in April 1988.

[3]GAO/RCED-88-143, Aug. 5, 1988.

[4]FAA's recent delay analysis, "The Los Angeles Airspace Capacity Project," was provided to us as part of the agency's comments on a draft of this report. We have not evaluated the analysis and cannot comment on the validity of its results.

According to FAA and DOD officials, discussions also could have been facilitated earlier by guidance from FAA and DOD top management to local-level negotiators concerning acceptable compromise positions. FAA recently established a headquarters staff that should be able to provide management oversight and technical support for major national airspace plans. This staff plans to coordinate with corresponding units in the military services. This will be important because discussions such as these will continue to occur as FAA improves its airspace management in other parts of the country. (See app. II for additional details on problems posed by military airspace.)

West Coast Plan Needs Better Oversight and Coordination

FAA's action to decentralize the West Coast Plan's management also reflected FAA officials' belief that the projects no longer needed a coordinated management approach in the regional office. However, after the Plan was dissolved, instances of ineffective project management occurred which we believe could be avoided in the future if coordinated project development and implementation were reestablished in the field. Three such instances stand out as indications of a need for better oversight and coordination of the West Coast Plan.

First, duplication occurred in two instances between FAA's Western-Pacific and Southwest regions in planning and budgeting for four navigational aids costing an average of $1.7 million, including equipment procurement and installation and land acquisition. In January 1988 both regions submitted fiscal year 1990 budget requests to FAA headquarters to fund two navigational aids at the same general location in Arizona to serve the same purposes. In addition, both sets of equipment were in support of the West Coast Plan and were intended to improve the traffic flow within and between Arizona and California. Since then, budget cuts for facilities and equipment have occurred, and the FAA project manager in headquarters responsible for procuring the navigational aids does not know whether both regions are still requesting all of the duplicate equipment. Further, the project manager was not aware of the duplicate equipment requests from the regions and said that it is a regional responsibility to ensure that this does not happen.

Second, consistent information did not exist within the regional office regarding the planned installation of a navigational facility near the San Francisco airport. This project is an example of a complex undertaking involving three Western-Pacific Regional Office divisions: Air Traffic, Airway Facilities, and Flight Standards. Information these divisions provided us on the timing and status of the project varied from division to

division. We believe that FAA officials monitoring this project's status would experience similar frustrations. The Western-Pacific Regional Office Manager of Airspace and Procedures Branch stated that an overall project manager in the region could facilitate coordination among the divisions.

Third, according to the Assistant Manager for Military Operations of FAA's Los Angeles Air Route Traffic Control Center—a key FAA facility in the negotiations with DOD—a more coordinated approach to negotiating with DOD would hasten this otherwise lengthy and difficult process. Since FAA ended the Plan's central management, the region has continued to negotiate for specific route changes with individual military facilities. While some compromises and agreements have been achieved, the assistant manager said that negotiations with local military installations for individual routes have proved more difficult and time-consuming than expected. The assistant manager—who is also the chief negotiator with the military—also believes that since the coordinated management of the Plan within the regional office was terminated, FAA may not be giving its local officials the financial and administrative support they need to develop their projects. He said that this could be especially true for those projects that FAA had not fully developed at the time the "West Coast Plan" designation was discontinued.

DOD officials also believe that FAA would be more convincing in discussing airspace changes if the agency used a more coordinated approach. They reason that FAA would have more leverage in each separate case if all special use airspace negotiations were coordinated at least on a regional level, rather than pursued one-at-time on the local level. Several newly created mechanisms now exist in FAA headquarters that should enable better central and strategic oversight of inter-regional coordination. However, they cannot adequately coordinate at the local level an effort as complex as the West Coast Plan. For example, as noted earlier, in April 1988 FAA established the National Airspace Capacity Staff. But because of this staff's limited size and broad charter, it cannot stay abreast of all that happens in the field daily in connection with every major airspace change. Another important administrative change is FAA's implementation of a new organizational alignment on July 1, 1988, that allows divisions in a region to report directly to their corresponding associate administrator in headquarters, instead of to the regional administrator. While this more direct reporting to headquarters is intended to allow more headquarters involvement in field operations than has occurred in the past, it also could make worse the ineffective coordination among divisions we found in the Western-Pacific region.

expanding weapons system deployment, combat training, and flight testing. This has created a problem of competing priorities—commercial airlines are clogging the remaining airspace, and the military wants to increase its airspace for expanding missions.

FAA has proposed various commercial uses of the special use airspace, including establishing new routes and navigational aids within the perimeters of the military-assigned space. FAA's proposals to relieve congestion in the Los Angeles basin would have a detrimental impact on special use airspace located in the desert regions of California, Arizona, and Nevada and around Edwards Air Force Base, the Naval Weapons Center at China Lake, Nellis Air Force Base, the Marine Corps Air Ground Combat Center at Twentynine Palms, and the Yuma Proving Grounds. Three major choke points are defined by these military installations' special use airspace. They are 10, 24, and 45 miles wide, respectively, and en route flight operations through these points totaled over 1.2 million in 1987.

FAA is seeking both short-term and long-term solutions to the choke-point problem. In the short run, FAA is negotiating with individual military facilities to obtain use of certain slices of special use airspace during peak commercial traffic periods. In the long run, FAA is seeking to obtain and install navigational equipment that create new jet routes through special use airspace. These new routes would be at a specific altitude, and their use as jet routes would range from 24 hours a day to only a few hours during peak periods. Some of these negotiations have proved fruitful. For example, a third flight corridor has been established through one of the choke points. According to DOD officials, this has increased traffic on this route by about 30 percent.

In discussions over the past 2 years with the military, FAA and DOD positions have been far apart. FAA and DOD members of the West Coast Plan work group addressing air traffic problems were unable to agree on greater use of special use airspace to accommodate commercial needs. At its fourth and last meeting beginning on September 22, 1987, the work group adopted a proposal for making a series of route changes and installing navigational aids. However, the DOD member of the work group rejected the proposal that would have required the military to release special use airspace at specified hours and altitudes and to allow navigational aids on military installations. According to DOD officials, the proposal was not developed with military concurrence, did not fully recognize the military's mission, and would have a significant, detrimental impact on combat training, weapons testing, and military research

and development. Thus, without a compromise position and with a dissenting opinion from DOD, the steering committee in October 1987 issued its report recommending that FAA's Associate Administrator for Air Traffic accept the work group's proposals.

Much of the disagreement between DOD and FAA has been that the military has not been convinced of FAA's stated need for access to military airspace. According to DOD officials, the work group could not show that it had adequately considered other factors that might improve the air traffic system, such as concessions in airline scheduling to relieve the "rush hour" effect and changes in the controller work force. Recognizing this and after being briefed by the steering committee and not endorsing its report, four FAA regional managers directed that a study be conducted to estimate the cost of delays that would be relieved by the work group's proposal. When the study became available in January 1988, DOD officials asserted that the study's results were faulty on several grounds. First, the data used to describe the severity of delays were not accurate. For example, FAA presented aggregate delay information derived from air carrier data—all individual flight delays of more than a minute over a specific period. Most of these delays were less than the standard 15-minute delay that FAA uses to classify an official flight delay.[2] Further, DOD officials said that FAA's data were not congestion-related, but weather-related, and that FAA could not identify which airspace sectors were responsible for the delays. Finally, the officials said that FAA's analysis does not recognize the potentially large cost to the military of relocating its training and testing ranges to allow for the establishment of new commercial air routes through airspace currently assigned to the military. For example, an Air Force airspace manager estimated the cost of relocating the low-level test range near Edwards Air Force Base in California at about $1 billion.

FAA has conceded that although its case for large current savings could be made stronger with better data, the work group's proposal is aimed at the longer term when demand for air travel will be even higher. Thus, DOD's arguments notwithstanding, the work group continued to favor its proposal for making route changes and installing navigational aids.

According to DOD officials, none of the alternatives to the work group's proposal presented by DOD work group members was acceptable to the

[2]Although we did not verify this study's methodology or results, we have questioned FAA's methodology of aggregating many small amounts of delay time to derive a large dollar-value passenger time-savings benefit for such major system acquisitions as the Microwave Landing System and the Advanced Automation System.

work group. One called for joint FAA-DOD use of special use airspace when not in use by the military, but this was considered more or less a continuation of the status quo and did not provide FAA consistent access to the airspace. Another proposed restructuring air carriers' commercial flight schedules, but this was not feasible because it was not within FAA's immediate control.

FAA's Director of Air Traffic Operations Service and the Air Force's Chief of Air Force Representatives at FAA facilities believe that more substantive, early involvement by both FAA and DOD top management might have ensured more successful problem-solving discussions between FAA and DOD field personnel. They believe that the discussions might have been more productive if FAA and DOD top management had articulated an overall policy for establishing new air routes that might have included specific points at which each side was expected to compromise. DOD officials say, however, that this coordinated, top-down guidance was not possible because the West Coast Plan was not formally presented to either FAA or DOD top management for review or approval until April 1988. Thus, top officials in the two organizations had no official basis for policy-making.

In April 1988, as part of a West Coast Plan briefing for the FAA Administrator, FAA officials proposed the creation of a joint DOD/FAA oversight committee at the policy and decision-making level to arbitrate any disputes that could not be resolved at the technical level. This proposal was not acted on, however. Instead, FAA top management directed the Western-Pacific region to restructure and manage West Coast Plan projects independently—in effect, terminating the West Coast Plan as a coordinated set of projects. According to some FAA officials, this action was aimed at facilitating future negotiations with DOD by demonstrating that FAA was willing to start from scratch to convince DOD of the merit of FAA's proposals for greater and more consistent commercial use of special use airspace.

In another action taken in April 1988, FAA established the National Airspace Capacity Staff to serve as a focal point for all major national airspace plans involving permanent changes to traffic flows, airspace realignment, and boundary changes. The staff of six professionals has broad responsibilities; two that relate to DOD involve (1) ensuring coordination and understanding of all major airspace projects within FAA, the aviation community, and other government offices, such as DOD, and (2) working with the FAA offices and services that maintain liaison with the

military on airspace matters. Thus, an office now exists in FAA headquarters that is charged with providing management oversight of and technical support to regional activities related to major airspace plans.

Navigational Aids

According to an FAA special projects specialist, a lack of navigational aids precludes the utilization of parallel, two-way routes through choke points to accommodate air traffic safely and efficiently. This results in air traffic delays, increased user costs, and periods of extremely heavy work load for controllers. To address this problem, FAA has proposed installing nine new navigational aids at a cost of about $11.7 million.

Phoenix Metropolitan Area

Two West Coast Plan projects affect the Phoenix area. The purpose of the first project, which was completed in January 1989 and discussed in an earlier section of this appendix, is to fill gaps in radar coverage in Arizona that are caused by mountains blocking radar signals. The purpose of the second is to reduce traffic congestion in the Phoenix area by establishing a new navigational aid near Carefree, Arizona.

Carefree, Arizona, Navigational Aid. The Salt River navigational aid currently guides all air traffic into and through the Phoenix area. It is an extremely congested area, with air traffic consisting of military jet trainers, commercial air carriers, and corporate and general aviation. Controller work load is compounded by having to reroute most low-altitude en route traffic (not landing in the Phoenix area) around the Salt River guidance station. To relieve the air traffic control burden that this situation places on the system, FAA plans to install another navigational aid station named "Carefree" at a point in the north Phoenix area. This station will guide all nonjet traffic for Scottsdale, Deer Valley, and Falcon Field. Jet traffic will continue to use the Salt River navigational aid. According to FAA, congestion will be mitigated, controller work load will be eased, and departure/arrival delays will decrease, all while enhancing aviation safety and at a cost of approximately $3 million.

If fiscal year 1990 budget requests are approved, FAA estimates that the project will not be completed until 1992 because of the time needed to obtain and install the equipment. In addition, the site location itself is in doubt because the land value is so high.

Objectives, Scope, and Methodology

On April 26, 1988, Chairman Glenn Anderson of the House Public Works and Transportation Committee, and Chairman Norman Mineta, who was then Chairman of the Subcommittee on Aviation, asked us to provide information on the status of FAA's efforts to improve airspace management on the West Coast. These efforts have become known as the West Coast Plan. In subsequent discussions with the Chairmen's offices, we also agreed to review and provide information on FAA's negotiations with DOD for greater commercial use of military special use airspace and FAA's overall management of the Plan.

Thus, our specific objectives were to

- identify changes in procedures and air routes being contemplated by FAA and the time period over which FAA expects to implement the West Coast Plan;
- assess FAA's plans to involve the public in any changes it proposes and discuss the status and/or results of any environmental assessments FAA has made or is making related to new air routes on the West Coast;
- provide information on the status of FAA's negotiations with DOD regarding special use airspace; and
- review FAA's overall management of the West Coast Plan and provide our observations on how that management could be improved.

To achieve our first objective, we reviewed documentation and interviewed officials in FAA's Western-Pacific Regional Office in Los Angeles, California. We collected descriptive, cost, and potential environmental impact information on the 10 projects comprising the West Coast Plan. Because several of these projects related to the missions of specific DOD facilities, we met and discussed these interfaces with appropriate DOD officials assigned as liaison officers to FAA.

We addressed our second objective by comparing an environmental assessment related to the West Coast Plan with applicable federal guidance for preparing such documents. This guidance included Council On Environmental Quality regulations implementing the National Environmental Protection Act of 1979, as amended, and FAA Order 1050.1D, Policies and Procedures for Considering Environmental Impacts. While we did not evaluate the merits of the airspace action proposed in the environmental assessment, we did review the assessment's adherence to the applicable guidance.

To develop information on the status of FAA's negotiations with DOD, we reviewed documents related to these negotiations, including minutes of

work group meetings and a summary report prepared by the West Coast Plan steering committee, and interviewed both FAA and DOD officials in the field involved in these negotiations. We also discussed the status of FAA's proposals for making greater commercial use of military airspace with Navy, Air Force, Army, and Marine Corps special use airspace officials in the Pentagon.

Our review of FAA's overall management of the West Coast Plan focused on the effects of a key action taken by FAA top management shortly before Chairmen Anderson and Mineta requested this review. This early April 1988 action caused the Plan to be dissolved so that the coordination among the projects in effect up to that time was effectively terminated. We discussed the effects of this termination with FAA officials in the regional office and in headquarters.

Our review was conducted between July 1988 and February 1989 and adhered to generally accepted government auditing standards.

Major Contributors to This Report

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Finally, FAA established the position of Program Integrator for STAR and T-LABS to facilitate the coordination required between headquarters organizations and regions to ensure program consistency and smooth implementation for these two projects.

Conclusions

Because FAA expects some West Coast Plan projects to result in new, revised, or more heavily traveled existing air routes at relatively low altitudes and near populated areas, it needs to closely review the expected environmental impact that these changes could have. Moreover, if the review shows that an environmental assessment should be prepared, FAA should adhere more closely to its own internal guidance than it has in the past and take into account NEPA regulations concerning public involvement in the assessment process. In this way, project costs and benefits are opened to public scrutiny, and alternatives, if necessary, can be developed.

FAA, through a West Coast Plan work group, attempted to define and solve problems associated with West Coast special use airspace for more than 2 years. During much of this time, FAA and DOD officials were proposing solutions to the problem of how commercial and military needs can be met with a limited amount of airspace. These efforts might have been more successful, however, if the results of FAA's study of delay cost had been more convincing to DOD. FAA, on the other hand, believes that many of the benefits to solving today's airspace problems will accrue in the future as air traffic volume grows. In addition, discussions might have been more successful if both sides' top management had provided early, specific guidance on acceptable compromise positions.

To facilitate discussions between DOD and FAA regarding proposals for greater commercial use of special use airspace, FAA removed the "West Coast Plan" label and associated project coordination from the set of 10 projects. This was accompanied, however, by project management inefficiencies that might have been avoided with better oversight and coordination. A program of this magnitude, composed of many separate projects sharing similar goals, needs to be coordinated. Although establishing the National Airspace Capacity Staff to coordinate airspace changes on a national basis and having regional divisions report directly to headquarters will help, FAA needs to consider how to ensure coordination of related airspace projects, especially those focused on a specific part of the country or carried out in a single regional office.

Recommendations

To ensure that FAA's plans for making airspace and flight procedure changes adequately reflect the concerns of those entities that will most be affected by those changes and that the plans are effectively managed, we recommend that the Secretary of Transportation direct the Administrator, FAA, to do the following:

- Develop a means to facilitate and evaluate regional office adherence to FAA Order 1050.1D, particularly in preparing environmental assessments.
- Consider ways of ensuring coordination and integration of related airspace projects that are focused on a specific geographic part of the country or are carried out substantially by a single FAA regional office. In the case of the West Coast Plan, this might necessitate reestablishing the position of a West Coast Plan manager in the Western-Pacific region.

Views of Agency Officials

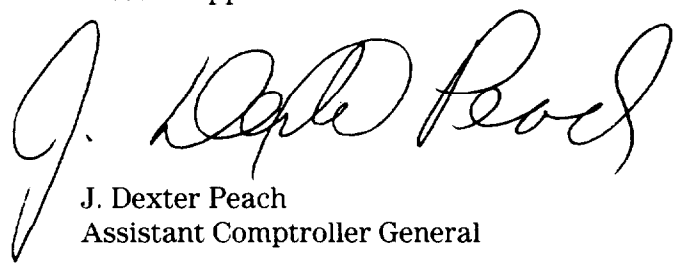
Department of Transportation and FAA officials provided us with official oral comments on a draft of this report. DOD officials also provided comments that were characterized as unofficial but were provided by responsible military officers assigned to manage special use airspace and coordinate its use with FAA. Officials of the three agencies agreed with our recommendations and, for the most part, our conclusions. We have incorporated their comments as appropriate.

However, FAA and Department officials disagree with us that FAA did not appropriately take into account CEQ regulations regarding public involvement in the environmental assessment for the revised Long Beach departure procedure. They contend that two of the criteria necessary for making the assessment available to the public were not present in this case: (1) the proposed action normally results in an environmental impact statement or (2) the action is without precedent. However, the two examples cited by the Department apply to when a FONSI has to be made public—they do not refer to when an environmental assessment should involve the public. In addition, we also believe that the environmental controversy, as noted in 40 C.F.R. 1506.6, exists or can be assumed to exist at the Long Beach Airport because FAA's Western-Pacific Regional Office prepared the environmental assessment in anticipation of this controversy. However, FAA cannot determine the extent of the controversy, or resolve it if necessary, until the public is made aware of the proposed action.

In preparing this report, we reviewed documents and interviewed FAA and DOD officials located at FAA's headquarters in Washington, D.C., and its Western-Pacific Regional Office in Los Angeles, California. (See app. III for details on our scope and methodology.)

As arranged with your offices, unless you publicly announce its contents earlier, we plan no further distribution of this report until 15 days from the date of this letter. At that time, we will send copies to the appropriate congressional committees, the Secretary of Transportation; the Administrator, FAA; the Secretaries of the Air Force, Army, and Navy and the Commandant of the Marine Corps; and to other interested parties. We also will make copies available to others upon request.

This work was performed under the direction of Kenneth M. Mead, Director, Transportation Issues. Major contributors to this report are listed in appendix IV.



J. Dexter Peach
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Abbreviations

CEQ	Council on Environmental Quality
DME	Distance Measuring Equipment
DOD	Department of Defense
EIS	Environmental Impact Statement
FAA	Federal Aviation Administration
FONSI	Finding of No Significant Impact
LDA	Localizer Directional Aid
NEPA	National Environmental Protection Act
STAR	Southern California Terminal Airspace Realignment
T-LABS	Terminal-Los Angeles Basin Service
TRACON	Terminal Radar Approach Control
TVOR	Terminal-Very High Frequency Omnidirectional Range Station

Summary of West Coast Projects

Project	Description/Benefits	Status	Environmental Impact	Cost
San Francisco Bay Area				
Expanded Visual Approach Procedures	Less stringent visual flight rule weather conditions have been proposed to increase airport capacity under cloudy conditions.	Implementation scheduled for April 1989.	No impact expected.	$199,400
Localizer Directional Aid (LDA) Approach	Installation of this precision approach equipment will reduce delays by allowing use of parallel runways for arrivals under cloudy conditions.	Requires equipment and staffing. Implementation scheduled for end of 1990 to mid-1991.	Possible impact, noise study recommended.	$1.8 million
Distance Measuring Equipment (DME) for Merced, CA	DME installation increases safety and efficiency by allowing pilots to determine their distance from the navigational aid without communicating with the air traffic controller.	DME installed June 30, 1988.	No impact expected.	$ 24,000
Los Angeles Basin				
Southern California Terminal Airspace Realignment (STAR)	Modifies airspace controlled by air traffic control facilities to reduce complexity of air traffic management and increase airspace capacity.	Project underway with completion date unknown.	Possible impact; new air routes expected after 1994.	$7.7 million
Terminal Los Angeles Basin Service (T-LABS)	Consolidation of four air traffic control facilities into one to coordinate air traffic management better.	Advanced engineering underway. Completion scheduled for 1994.	Possible impact; new air routes expected after 1994.	$111.7 million
North-South Route				
Expanded Offshore Route	Offshore route proposed between San Francisco and Los Angeles to reduce delays and controller work load and enhance safety.	FAA must negotiate with military for necessary airspace for proposed route. Completion date unknown.	No impact expected.	$6.8 million for navigational aids
East-West Traffic Flows				
East-West Flows	Creates new routes by obtaining military airspace and installation of 9 navigational aids. New routes will enhance safety and reduce delays and controller work load.	Negotiations with military ongoing. Navigational aids requested in FY 1990 budget. Completion date unknown.	No impact expected.	$11.7 million for navigational aids
Phoenix Metropolitan Area				
Arlin Arrival to Phoenix, AZ	Established arrival route into the Phoenix area to separate arriving air traffic from through-traffic to reduce complexity of air traffic management.	Implemented June 30, 1988.	No impact expected.	None
Terminal-Very High Frequency Omnidirectional Range Station (TVOR) for Carefree, AZ	TVOR installation will guide nonjet traffic to general aviation airports, reducing area air traffic and complexity.	Funding requested in FY 1990 budget. Completion scheduled for 1992.	No impact expected.	$3 million

(continued)

Project	Description/Benefits	Status	Environmental Impact	Cost
Yuma Radar Remoting to Alburquerque, NM	Receiving radar signals from Marine Corps radar facility will alleviate gaps in radar coverage and allow low-altitude tracking.	Installation funds are available, but equipment is unavailable. Completion date unknown.	No impact expected.	$113,000

Ten Projects Comprise West Coast Plan

West Coast Plan projects are in varying stages of implementation: 3 of the 10 projects are complete, and FAA plans to implement the others between now and 1994. Some projects involving greater commercial use of airspace assigned to the military have been delayed because FAA has not reached agreements with DOD over how to increase commercial use of this airspace.

Completed Projects

As of March 1, 1989, three projects have been fully implemented. The first involved adding distance measuring capability to the existing navigational equipment near Merced, California, to assist arriving flights to the San Francisco Bay area. The second project established a new arrival route into the Phoenix, Arizona, airport. The third project involved working with the Marine Corps in Yuma, Arizona, to fill gaps in radar coverage caused by mountains blocking the radar signals.

Distance Measuring Equipment at Merced, Ca

This project was implemented on June 30, 1988, at an approximate cost of $24,000. Before implementation, the navigational aid near Merced, California, allowed aircraft to establish their direction but not their distance from Merced. As a result, controllers frequently had to provide pilots with distances from Merced. The distance measuring equipment (DME) now installed at the Merced navigational facility allows pilots to determine their distance from Merced without asking controllers. According to FAA, the primary benefit of this is enhanced air traffic controller efficiency because controllers can issue a single navigational instruction to pilots using a DME position without having to establish where the aircraft is located. To the extent that controller work load is decreased and the system is made more efficient, a secondary benefit of this change, according to FAA officials, is enhanced safety. Officials also said that this project did not change aircraft routing and had no environmental effects.

Arlin Arrival to Phoenix

Increased air traffic through the Phoenix, Arizona, area has increased the amount and complexity of controllers' work load in these air sectors. To reduce this complexity, which, according to FAA, could jeopardize safety, FAA established a new high-altitude arrival route—the "Arlin arrival"—to the Phoenix airport. Instead of descending from the existing route through lower altitude traffic destined for points east of and beyond Phoenix, aircraft arriving at Phoenix from the west now approach on a more southerly route. As the aircraft lose altitude and approach the airport, the new route merges with the existing route.

Thus, at low altitudes no difference in environmental effect is perceived from the ground because total traffic near the airport is the same as before the change.

The Arlin arrival was established June 30, 1988, when FAA obtained DOD's agreement for use of a narrow slice of military-assigned airspace. The altitudes on the new route range from 24,000 feet to 29,000 feet, and FAA estimates that the air traffic volume will be about 100 flights per day. Because of the high altitude, the new route's environmental effects were judged to be negligible, and FAA did not prepare an environmental assessment. There were no capital costs for this project.

Yuma Radar Remoting to Albuquerque

Gaps in the long-range radar coverage in southwestern Arizona have resulted in air traffic controllers' inability to accurately monitor low-altitude air traffic. According to FAA, such gaps in the radar system, caused by mountainous terrain blocking radar signals, have led to excessive delays at Phoenix because controllers must slow traffic down to account for the traffic unseen by the radar. FAA officials say that restrictions in the en route airspace also contribute to delays in the area. For example, large sectors of military special use airspace limit commercial air traffic through the area to a single, 10-mile-wide route. Furthermore, inadequate radar coverage limits controllers' ability to advise commercial traffic about military aircraft that may spill out of special use airspace at lower altitudes.

Because of mountainous terrain, FAA radars are not able to monitor all traffic in the airspace for which FAA is responsible. However, radars at the Yuma Marine Corps Station are able to track and monitor the traffic that are currently blocked from FAA radar coverage. Therefore, to supplement its coverage, FAA began transmitting radar signals from the Yuma Marine Corps Air Station to the Albuquerque Air Route Traffic Control Center as of January 24, 1989. This should enable the Albuquerque center to more accurately monitor flights in the region. FAA expects the benefits of this arrangement to include safer and more efficient air traffic management and fewer delays at the Phoenix Airport. The project's total cost was about $113,000, $13,000 of which was for installation of approximately $100,000 worth of equipment.

Projects Under Development

FAA has West Coast Plan projects under development at the San Francisco Airport, in the Los Angeles basin, along flight corridors running north-south over the California coast and east-west through special use

airspace, and in the Phoenix metropolitan area. FAA points to airport and airspace limitations, regulatory actions, and unprecedented growth in air traffic activity as having contributed to the complexity of air traffic management in the Southern California area. According to FAA, these factors have severely strained the air traffic control system, causing delays and increasing controller work load. FAA established the following projects to reduce the complexity of air traffic management.

Expanded Visual Approach Procedures at San Francisco International Airport

Arrival capacity at San Francisco Airport is halved when cloudy conditions prevail, according to an FAA airspace procedures specialist. Side-by-side arrival operations are possible on the parallel arrival runways only when weather conditions allow visual landings; under current rules, this is when the ceiling (cloud coverage) is no lower than 2,100 feet with a 5-mile visibility. When the tower deems that the approach pattern does not meet these conditions, all landings must take place in single file on one runway under instrument flight rules, thus limiting airport capacity.

As one of two projects to increase airport capacity—which the airspace procedures specialist says will reduce delays and save the airlines both time and money—FAA proposes that visual landings at the San Francisco Airport be allowed under less stringent rules. The proposal specifically calls for lowering the cloud ceiling from 2,100 feet to 1,000 feet with a 5-mile visibility over the airport, but retaining the 2,100-foot ceiling over the final approach. The current normal point of weather observation is next to the tower. However, because the tower is more to the west and nearer the ocean, the cloud ceiling at the tower is normally lower than at the final approach area and runway. As a result, weather near the runway and final approach often is relatively clear, while it is cloudy near the tower. FAA's proposal is based on the agency's belief that only the final approach course needs to be clear for visual approaches to be made safely. FAA's Director of Air Traffic Operations noted, however, that before project implementation now scheduled for April 6, 1989, FAA needs to install and test two key pieces of equipment: an automated weather observing system to be located several miles from the airport and a precision approach path indicator. The cost to purchase and install equipment associated with this project is $199,400.

Localizer Directional Aid Approach at San Francisco International Airport

As discussed under the previous project, San Francisco International Airport's two parallel, east-west runways (28L and 28R) are used for visual, side-by-side landings during clear weather but not in marginal weather conditions. Side-by-side landings during cloudy weather are not safe because the runways are too close together for instrument landings. The runways are 750 feet apart and instrument landings on parallel runways require a 4,300-foot runway separation. Consequently, only one runway can be used and arrival capacity at San Francisco is halved when cloudy conditions prevail.

FAA plans to install a navigational device called a Localizer Directional Aid (LDA) that allows aircraft to arrive in staggered pairs on both runways during adverse weather conditions as long there is a 6-mile visibility and a 2,100 ceiling. Under instrument flight rules, this device guides aircraft arriving on runway 28R at an angle relative to the aircraft arriving on a straight approach to runway 28L. Angling the approach to runway 28R results in the required greater separation between the aircraft that is necessary during periods of reduced ceiling and poor visibility. The separation gradually is reduced as the two aircraft approach the parallel runways, and when the pilot landing on 28R is close enough to the runway to see it and the other aircraft, he lines up with the runway and performs a visual landing.

FAA expects capacity at San Francisco to increase during some adverse weather conditions since staggered pairs of aircraft can land more efficiently with the new directional aid, compared with the current practice of singularly spacing them 3 to 5 miles apart. Paired arrivals also mean fewer delays for flights departing the airport. This is because departing aircraft must cross the two arrival runways and can do so more efficiently if arrivals come two at a time instead of singly. FAA estimates that this project will cost about $1.8 million and save airlines as much as that amount every year. Before implementing this project by the spring of 1991, FAA must install and test the necessary equipment, perform an environmental review, and obtain the necessary staffing.

Southern California Terminal Airspace Realignment (STAR)

To accommodate the Los Angeles basin air traffic growth, FAA is implementing two projects that it believes will enhance safety, increase airspace capacity, and reduce controllers' work load in this area. One of these is the STAR project through which FAA is reassigning responsibility for airspace among air traffic control facilities, increasing controller staffing, and revising some air routes. The reassignment involves enlarging the airspace controlled by Terminal Radar Approach Control

(TRACON) facilities in the Los Angeles area by reducing the airspace now controlled by the Los Angeles Air Route Traffic Control Center.[1] The TRACONs involved are the Los Angeles, Burbank, Ontario, and Coast facilities.

FAA officials said that before implementation of STAR, the vertical airspace controlled by these TRACONs generally varied from 6,000 feet to 13,000 feet. In some cases, gaps existed among the various TRACONs' lateral coverage because their boundaries did not meet. Under STAR, FAA uniformly raised the vertical airspace controlled by Los Angeles area TRACONs to 13,000 feet and expanded their lateral boundaries so that together the TRACONs now control the entire Los Angeles basin.

According to FAA, enlarging TRACON-controlled airspace in the Los Angeles basin enables the area to accommodate increased air traffic. The minimum separation distance of aircraft under TRACON control is 3 miles, versus a 5-mile separation of en route aircraft. This difference is due, in part, to the type of radar used. TRACON radars, which are designed for the airport terminal environment, have a relatively short maximum range of 60 miles, but they provide more clarity than the 200-mile-range radars used at the en route centers. Thus, more aircraft can fly in the same airspace if it is controlled by a TRACON rather than an en route center. In addition, by enlarging the lateral boundaries of the TRACONs, they can control aircraft for longer periods of time before handing them off to the Los Angeles Air Route Traffic Control Center. Three of the four TRACONs extended their control to 13,000 feet as of February 6, 1989, and FAA estimates that the Coast facility will expand its range by July 3, 1989. FAA also has increased staffing at the four TRACONs to meet the increased work load created by STAR.

FAA estimates STAR's total cost at $7.7 million. To date, route changes as a result of STAR include one minor change near the Burbank airport, an increase in the number of flights on an existing departure route from Long Beach Airport, and a reduction in the number of flights on another departure route. According to an FAA project specialist, analysis to determine the need for further route changes will occur after the implementation of STAR.

[1]TRACONs are facilities that monitor and control air traffic while it is near—either approaching or departing—the airport. Air Route Traffic Control Centers control traffic as it travels en route between airports.

Terminal Los Angeles Basin Service (T-LABS)

T-LABS is the second project focused on improving Los Angeles basin air traffic management. Following the realignment of TRACON airspace, FAA will initiate further improvements under the T-LABS project. Currently, four TRACONs (Los Angeles, Burbank, Ontario, and Coast) monitor terminal air traffic in the Los Angeles basin. Complex coordination between the TRACON facilities is required to monitor air traffic in the area. With T-LABS, FAA plans to physically consolidate these facilities to better coordinate traffic management after their airspace boundaries are modified under STAR. The project involves the design and construction of a building to house the consolidated TRACON facility.

FAA expects this consolidation to result in safer and more efficient use of Southern California airspace. The agency also expects controller work load to be reduced because the four current TRACONs no longer will need to coordinate among themselves the monitoring of the high-volume, complex airspace in the Los Angeles basin. Instead, the single consolidated TRACON will monitor terminal air traffic in the area.

FAA estimates that in the Los Angeles airspace airlines will save $21.9 million annually from reduced delays. In addition, FAA expects to save $4.4 million annually in personnel retention costs. The total implementation cost is now estimated at $111.7 million through 1994. FAA officials expect that most of this amount will be in the fiscal year 1991 budget. The schedule calls for land acquisition in May 1990, construction from April 1991 through December 1992, and consolidation of the TRACONS during the period of 1993 to 1994. Complete consolidation of the facility is scheduled for December 1994. According to an FAA project specialist, a high probability exists that route and flight procedure changes will occur in the Los Angeles basin after T-LABS is implemented to adjust to the more efficient alignment of airspace sectors that should occur.

Expanded North-South Off-Shore Route Between San Francisco and Los Angeles

FAA describes the north-south routes between the San Francisco Bay and the Los Angeles basin as saturated and facing additional demand. Officials believe that this is resulting in delays, unnecessary route complexity, increased controller work load, and potentially unsafe flying. To counter this situation, FAA proposes to expand the existing north-south route structure by increasing the current five routes to nine. FAA also proposes to extend the offshore route (which currently runs from San Francisco to just north of Morro Bay) farther south to Los Angeles. This proposed route is to direct traffic to airports other than Los Angeles International Airport. FAA estimates that the route will carry about 200 aircraft a day.

Further development of this offshore route has been postponed until FAA can negotiate with the military for permission to pass over military-sensitive points just south of Morro Bay. Expansion into nine routes also has been postponed until the consolidation of Los Angeles area air traffic control facilities (T-LABS) is completed. Consolidation is required for effective air traffic coordination on these nine routes.

The military has said it is not prepared to allow civilian air traffic to pass over until it reviews a security study of Vandenberg Air Force Base. The Air Force completed the study in September 1988 but is still reviewing the results to determine what effect a new commercial air route might have on the military mission in the Vandenberg area.

A lack of navigational equipment and the presence of mountainous terrain are also impeding progress on the north-south route expansion. FAA's Western-Pacific region has submitted a fiscal year 1990 budget request for three navigational aids supporting the north-south route. These aids would be used for establishing new routes or adjusting existing routes, and FAA estimates their cost at approximately $6.8 million.

East-West Traffic Flows

The West Coast Plan identified problems in the air traffic en route system that cause delays and adversely affect air traffic operations into and out of West Coast airspace. Contributing to these problems were three major causes: insufficient arrival and departure fixes (geographical markers or locations where aircraft enter/exit established air routes) at Los Angeles basin airports, insufficient en route flexibility because of "choke points" created by the location of military-assigned special use airspace, and a lack of land-based navigational facilities to use as a basis for developing innovative flight procedures and providing additional flexibility to enhance system capacity.

Arrival/Departure Fixes

According to FAA, a lack of multiple departure and arrival routes into and out of the Los Angeles Basin results in excessive air traffic congestion, controller-pilot interaction, and user cost. To address this problem, FAA plans to establish additional entry/exit points as part of the T-LABS project. FAA expects these changes to reduce delays caused by air traffic congestion and to reduce the complexity and magnitude of the air traffic control function in these air sectors.

Special Use Airspace

FAA officials say that the use and location of airspace assigned to the military in the southwestern United States, coupled with the growth in commercial air traffic over the last few years, has made it necessary to increase en route capacity to more efficiently handle the current air traffic volume. This is particularly true during the peak traffic periods each day. As shown in figure II.1, military airspace funnels and compresses air traffic flow to three east-west entry/exit points, called "choke points," for the Los Angeles basin. Because excess runway and terminal airspace capacity exists in this area, FAA officials believe that some widening of the choke points and establishing additional routes through military airspace would relieve the en route compression of air traffic during heavy periods of demand. They say that this would reduce the number of delays directly affecting the flying public and enhance safety.