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Report to Congressional Requesters

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AIRCRAFT NOISE

Implementation of FAA's Expanded East Coast Plan

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Resources, Community, and
Economic Development Division

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The Honorable James A. Courter
The Honorable James J. Florio
The Honorable Dean A. Gallo
The Honorable Matthew J. Rinaldo
The Honorable Peter W. Rodino
The Honorable Marge Roukema
The Honorable Christopher H. Smith
The Honorable Robert G. Torricelli
House of Representatives

As requested by your letters dated July 2 and 9, 1987, and as subsequently agreed with your offices, we reviewed several aspects of the Federal Aviation Administration's (FAA) implementation in February 1987 of the first phase of the Expanded East Coast Plan. The Expanded East Coast Plan is a comprehensive, three-phase revision of air traffic control routes and flight procedures in the eastern United States. Its primary purpose is to reduce air traffic delays at the New York City metropolitan area's three major airports. While FAA states that the plan has successfully reduced delays, New Jersey residents have lodged numerous complaints about increases in aircraft noise, which they attribute to air route changes made as part of the plan's first phase.

Our objectives were to provide information on

- the responsibilities of the relevant government agencies for assessing the environmental impact of revising air routes and flight procedures;
- effects of phase I of the plan, including air route changes;
- the method FAA uses to measure aircraft noise;
- FAA's rationale for not performing an environmental assessment of its plan; and
- actions taken in response to residents' complaints, including the methodology to be used in a noise survey for the Newark Airport and the surrounding countryside.

On February 26 and March 1, 1988, we briefed your offices on the results of our review, which we conducted from September 1987 to February 1988. This report contains the information discussed at those briefings, focusing specifically on changes in air routes and the resulting citizen complaints following implementation of phase I of the plan. We concluded that, because many important characteristics of the plan were known to FAA before the plan was implemented, FAA could have

foreseen that the plan would have a significant effect on some parts of New Jersey and result in controversy. We also believe that it is not too late for FAA to continue its environmental review process by (1) preparing an environmental assessment of the plan and (2) estimating how much of the reduction in delays is due to the plan versus other factors. This should improve the information base for determining the merits of the plan and help FAA judge whether the environmental effects of the plan warrant any adjustments to it.

The following provides summary information on these matters, and appendixes I through IV provide additional details.

Responsibilities for Assessing Environmental Impact

FAA has the sole responsibility for assessing the environmental implications of its proposed actions, although the Environmental Protection Agency (EPA) is required to review environmental impact statements prepared by FAA. In the case of the Expanded East Coast Plan, FAA judged that the environmental impact of the plan would not be significant and therefore did not take any additional actions in accord with its environmental review process—a process that could have ended with FAA preparing an environmental impact statement. FAA's judgment was based on a longstanding agency policy that exempts changes in airspace routes or flight procedures carried out 3,000 or more feet above ground level from the need to determine the environmental impact. Regulations containing this policy were approved by the Council on Environmental Quality, the executive branch office responsible for ruling on actions of this type, as conforming to the National Environmental Policy Act and to Council regulations based on that act.

Effects of the Plan

After FAA implemented phase I of the Expanded East Coast Plan in February 1987, it compared flight delays in early 1987 to a similar period in 1986 and concluded that the plan had significantly reduced delays, particularly at Newark. This was accomplished by creating additional air routes—highways in the sky—and revising others to accommodate the growing air traffic around the New York metropolitan area's three major airports: La Guardia, John F. Kennedy, and Newark. A major side effect, however, has been the negative reaction of New Jersey residents—including some who live 30 to 40 miles from Newark Airport—about the increased noise over their homes, noise that they attribute to the plan's first phase. FAA has since implemented phases II and III, but their principal features do not generally affect airspace over New Jersey.

Delay Reductions Are Not Clearly Linked to the Plan

FAA measures the benefits resulting from its airspace restructuring in terms of reduced flight delays.[1] FAA found that, compared to a similar period in 1986, delays in 1987 after the plan was implemented had decreased at the three New York area airports by 34 percent. FAA officials have not, however, linked delay reductions at any of the airports to specific components (route or flight procedure changes) of the plan. Moreover, they have not determined the extent to which delays were reduced due to other potential causes. One such cause was the exit from the Newark Airport during 1986 of a major airline's hubbing operation.[2] As noted by the Department of Transportation in its comments on a draft of this report, the hubbing operation was replaced by another airline's operation in Newark. However, the second airline's traffic volume was lower than that of the first. Thus, according to officials in the Office of the Secretary of Transportation, the hubbing exit alone probably was a major cause of reducing delays at Newark. Another cause was the antitrust immunity that the Department granted airlines in late January 1987 for discussing among themselves how best to shift flights during peak hours so that airport facilities could better handle scheduled flights.

Airspace Changes Over New Jersey

As a result of phase I of the plan, new and revised arrival and departure routes were created over New Jersey. Phase I, which went into effect in February 1987, involved three new departure routes, two new arrival routes, and six realigned routes over New Jersey. These changes caused some New Jersey communities to experience either new or additional air traffic overhead; other communities found that en route altitudes in their areas were lowered. For example, Long Valley, New Jersey—a community 34 miles from Newark Airport—formerly experienced some high altitude traffic but now experiences significantly greater inbound and outbound traffic at altitudes of from 5,000 to 14,000 feet. (See map in app. II.)

[1] A delayed flight is defined by FAA as one that remains on the ground at an airport for 15 minutes beyond its scheduled departure time.

[2] The concept of hubbing calls for large numbers of flights to arrive at an airport at about the same time and depart shortly thereafter so that passengers can make connections with other flights and continue on their itinerary without undue delay waiting for flights to arrive throughout the day.

Method FAA Uses to Measure Aircraft Noise

In determining the cumulative exposure of the environment to aircraft noise, FAA uses a measurement known as Ldn (day-night noise level) that averages the noise measured in dBA[3] from single events, such as aircraft overflights, over a 24-hour period. FAA adopted this measure in 1981 in response to a congressional mandate to establish a single noise measurement system. Ldn is used primarily for making land use compatibility determinations for areas adjacent to airports; however, because it is the only measure in use, it is also used as the standard for areas very distant from airports.

Federal guidelines specify a level of over Ldn 65 for aircraft noise over land areas not considered compatible for residential and certain other uses. FAA estimated in 1985 that about 5 million Americans live in areas where the Ldn is greater than 65 due to airport noise. To put this noise level in perspective, the 65-90 dBA range includes the noise level produced by an automobile 50 feet away traveling at 60 miles per hour (65 dBA), a household vacuum cleaner at 10 feet (69 dBA), or the noise perceived by the operator of a printing press in a printing plant (86 dBA).

FAA Judged That Environmental Assessment Not Necessary

FAA's mission calls for developing and maintaining a safe and efficient air transportation system while also minimizing the public's exposure to aircraft noise. The agency's approach to aircraft noise abatement includes promulgating standards and phasing in quieter aircraft engines, setting maximum allowable noise levels during takeoff and landing, and providing financial assistance for abatement programs. In addition, for certain actions, FAA is required by the National Environmental Policy Act to follow a process that could lead to preparing an environmental assessment—a concise description of the environmental effects of a proposed action and its alternatives. Based on the assessment's results, an environmental impact statement regarding those actions also might have to be prepared.[4]

Based on its policy regarding the conditions under which an environmental assessment or impact statement should be done, FAA exempted

[3]"dBA", or A-weighted decibel, is a unit of measurement for describing the intensity of sound as experienced by the normal human ear. It is the unit used in federal regulation of occupational noise exposure.

[4]The key substance of an environmental impact statement includes (1) the purpose and need for the action in question, (2) alternatives to the proposed action, (3) the probable impact of the action on the affected environment, (4) a discussion of the problems and objections raised by other federal agencies, state and local entities, and citizens in the review process, and (5) the environmental consequences as a result of taking the action.

its Expanded East Coast Plan from such an assessment. The exemption was based on the fact that the proposed changes would take place 3,000 feet or more above ground level—a condition specified in the policy as qualifying for exemption. However, the policy also stipulates that even an exempted noise-related action should be reviewed to determine whether it might be controversial, lead to community disruption, or have other adverse noise implications. FAA officials state that they did not foresee the controversy that resulted from implementation of the plan. If they had, they would have performed an environmental assessment.

FAA developed its policy on environmental assessment in response to the National Environmental Policy Act and, as such, it must be approved by the Council on Environmental Quality as to following the act and Council regulations. This approval was granted in 1979 and was recently stated again in connection with the plan in December 23, 1987, correspondence from the Council Chairman to Senator Frank Lautenberg, in which the Chairman said,

"... it has not been demonstrated either that the FAA's categorical exclusion for arrival and departure flight paths at or above 3,000 feet is inappropriate, or that this categorical exclusion was not applied correctly when the Expanded East Coast Plan was implemented."

The Council Chairman also noted that while route changes in the Expanded East Coast Plan are "eligible" for a categorical exclusion, this did not absolve the FAA of the responsibility to prepare an environmental assessment or impact statement if environmental impact exists or if there were other extraordinary circumstances.

Subsequent to this letter, the Council's Deputy General Counsel told us that, while it was within FAA's prerogative not to conduct an environmental assessment before implementing the plan, such an assessment is more reasonable now given the known impact of the plan on the environment and the resulting public opposition.

Actions Taken in Response to Noise Complaints

New Jersey residents, elected officials, and concerned organizations have disagreed with FAA's decision to exempt its plan from an environmental assessment. They have contended, in part, that the magnitude and geographic extent of airspace affected by the plan presented exceptional circumstances that warranted an assessment. Further, complainants pointed out the controversial nature of the plan, which introduced

aircraft overflights in communities with very low noise levels when jetliners were not present. In response to complaints about increased noise levels since the plan was implemented, FAA, New Jersey's Department of Environmental Protection, and the Port Authority of New York and New Jersey have taken a number of noise measurement and abatement actions.

Using a computer model, FAA analyzed aircraft noise for 24 hours over Long Valley—the source of many noise complaints. FAA's 1-day analysis showed that 144 flights passed over Long Valley in a corridor 5 miles wide and between 5,000 and 14,000 feet high. Factoring in the different aircraft types, the noise each makes, and their actual flight paths, FAA concluded that the community was exposed to an average day-night noise level of 50.5 Ldn. The study concluded that this did not necessarily mean that Long Valley residents were wrong in asserting that the plan has an effect on their quality of life, especially if few aircraft flew over their area before the plan.

The State of New Jersey's analysis involved single-event aircraft noise measurements, rather than averages as in FAA's study, at selected sites from 1.5 to 34 miles from Newark airport. It concluded that the noise levels near the airport clearly required reduction, although a recommended level was not provided, and that, even at the distant site, levels were much higher than the neighborhood noise level would be without aircraft overflights.

In March 1988, the Port Authority contracted for a broad noise survey in the areas immediately surrounding the Newark Airport and in a number of communities around and distant from the airport which may have been affected by the plan. According to the Port Authority's contractor, the survey's first component will identify areas adjacent to and near the airport where noise levels might be incompatible with residential land use. The second component will measure average noise levels in areas of New Jersey distant from Newark Airport where the plan has changed routes or where residents' blame the plan for irritating aircraft noise. In its comments on a draft of this report, the Port Authority assured us that the consultant would review citizen complaint data and plot each complaint source on a map to help identify appropriate areas for en route aircraft noise measurement. Overall, if complaint data are used properly and if the survey is conducted as proposed in other respects, we believe the results will enhance the level of understanding of the noise problem throughout the state.

In addition to the Port Authority's survey, FAA also is acting in response to citizen complaints about aircraft noise. In early 1988, FAA advised air traffic controllers at Newark that whenever possible—especially at night—controllers should direct flights along more varied paths within the several-mile-wide official routes, instead of over the same narrow band of geography time after time. The purpose of this is to spread traffic over a wider area and reduce flight frequency and therefore total noise over local communities.

Conclusions

In carrying out its mission, FAA must balance its goals of developing and maintaining a safe and efficient air transportation system with its responsibility to minimize impacts on the general public over whose homes aircraft create noise. FAA's performance in creating this balance has been questioned by the public's opposition and broad-based concern surrounding the implementation of phase I of FAA's Expanded East Coast Plan. In response, FAA and others have begun taking actions to measure and alleviate noise attributed to the plan. To date, however, these actions have not caused any significant change in the plan, and results from the Port Authority's noise survey will not be complete until September 1988.

The underlying causes of the increased noise—lowered flight altitudes, new and realigned routes, and increased traffic over areas where only light traffic occurred before the plan—were known to FAA before the plan was implemented. Additionally, FAA had described the plan as the most extensive revision to air routes and flight procedures in 20 years. For this reason, we believe that FAA should have expected the negative reaction of New Jersey residents. In this regard, FAA could have been more sensitive to environmental concerns by conducting an environmental assessment before implementing its plan. The assessment process would have provided more information to the public, allowed a wide range of views to be presented, and surfaced any alternatives to the plan that might have been available.

Similarly, this assessment process should be part of any subsequent plans FAA has to reduce delays and congestion in other parts of the country. Specifically, FAA needs to be mindful of residents' reactions on the West Coast and in the Chicago area as it plans air route and procedure changes to reduce congestion and delays in those areas.

We believe that the noise studies by FAA, the state of New Jersey, and the Port Authority have contributed and will continue to contribute to a

better definition and understanding of the aircraft noise problem in New Jersey. In addition, with phase I of the plan now in place for almost a year and a half, FAA has the opportunity to learn about the effects of the plan from the experiences of controllers, pilots, and airport operators. FAA could survey these groups and others knowledgeable of the before and after delay situations at the New York area airports to determine which portions of the reduced delays are due to the plan and which are due to other factors. Based on the results of these surveys and the noise studies currently underway, FAA should be able to make a more informed judgment on the overall merits of the plan and continue adjusting it to balance the benefits and noise effects.

Recommendations

We recommend that the Secretary of Transportation direct the Administrator, FAA, to improve the information base available on which to assess the merits of the Expanded East Coast Plan and other such major airspace changes by

- preparing an environmental assessment of the effects of the plan and, if significant impacts from the plan are found, preparing an environmental impact statement;
- making a qualitative determination of which portions of the reduced delays are due to the plan and which are due to other factors; and
- preparing an environmental assessment of any major proposal for making widespread air route or flight procedure changes on the West Coast or in other areas of the country where delays and congestion warrant such changes.

Agency Comments and Our Evaluation

The Department of Transportation provided comments on our draft report (see app. V) and they are summarized here together with our additional comments.

With regard to our first recommendation that FAA conduct an environmental assessment of the Expanded East Coast Plan, the Department does not concur and states that the basis for such an assessment—a comparison of the pre- and post-plan environments—cannot be developed at this time. The Department concludes this because data describing the pre-plan environment are not available. While this is true, we do not believe that it is sufficient reason for not preparing a comparative analysis. Instead, we believe that the pre-plan environment can be modeled, noise data can be estimated, and a reasonably accurate comparison can be made. Moreover, the Department states that it does plan

to use data available from two New Jersey noise studies to assess the post-plan situation and determine if the noise levels are high enough to be a problem. This is a positive step, and by combining the results of these studies with estimated pre-plan data, analyzing the results to determine problem areas, considering whether feasible alternative means of routing air traffic over the problem areas exist, and sharing this analysis with the public, we believe that the Department will have developed the essential components of an environmental assessment of its plan.

The second recommendation in our draft report called for FAA to conduct an economic analysis of the plan's benefits for the purpose of determining whether they outweighed the plan's costs as might be defined in an environmental assessment. The Department does not concur with this recommendation because it believes that the plan has had a major positive effect on reducing delays. While we agree that delays have lessened, we do not know what portion is attributable to the plan and what portion is attributable to other factors, such as peak-period rescheduling and declines in traffic volume at the three New York area airports. However, because we recognize that specific pre-plan economic and flight data, such as fuel usage and passenger time savings, needed to conduct an economic analysis are not available, we have revised our report to recommend that FAA conduct some minimum qualitative analysis to help distinguish that portion of delay reduction due to the plan from the portion due to other factors. Separating out the sources of delay could be based on qualitative judgments made by controllers, pilots, and airport officials. Until FAA collects and analyzes this kind of information, it will have little basis for judging the extent to which the delay reductions can be appropriately credited to the Expanded East Coast Plan.

Regarding our final recommendation on preparing environmental assessments for proposals for major air route or flight procedure changes, the Department states that procedures covering this area are already contained in an existing FAA order. The order discusses the need to prepare an environmental assessment in terms of whether FAA can anticipate environmental controversy or noise impact. While we believe this is an appropriate approach, we have reservations as to whether FAA has processes in place to make reasonable judgments about whether an airspace change will generate controversy and noise impact. Indeed, FAA states that it did not anticipate controversy in connection with the Expanded East Coast Plan, even though it knew in advance about the plan's many low-level route changes over populated areas and substantial additional jet traffic. We believe that, as part of the process of

implementing our recommendation, FAA will have to take certain steps that will help it to better anticipate possible controversy concerning major air route changes. These steps would include informing the public in unambiguous terms about the major airspace changes. Producing maps that show the proposed changes and that the public can understand would also help in this process. In this manner, potential controversy can be discovered in time to be addressed and factored into FAA's evaluation of any proposed airspace changes.

We also requested and received comments on our draft report from the Council on Environmental Quality and the Port Authority of New York and New Jersey (see apps. VI and VII). The Council generally found our report accurate but had some specific comments which we have incorporated into our final report. We also incorporated changes as a result of two concerns of the Port Authority.

We also are sending copies of the report to appropriate congressional committees; the Secretary of Transportation; the Administrator, FAA; the Director, Office of Management and Budget; and other interested parties. We will make copies available to others upon request.

This work was performed under the direction of Kenneth M. Mead, Associate Director. Other major contributors to this report are listed in appendix VIII.

J. Dexter Peach
Assistant Comptroller General

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Abbreviations

EPA	U.S. Environmental Protection Agency
FAA	Federal Aviation Administration
GAO	General Accounting Office

Regulating and Measuring Aircraft Noise

Since the deregulation of the airline industry in 1978, more competitive fares and economic expansion, among other factors, have contributed significantly to increased air travel nationwide and to airspace and airport congestion in certain heavily traveled areas. This congestion has caused widespread delays in both flights arriving at and departing from major airports. Congestion has been particularly heavy at the three major airports serving the New York City metropolitan area. Projected future growth in air traffic threatens to make air traffic delays even more extensive.

To alleviate these delays, the Federal Aviation Administration (FAA) began implementing the Expanded East Coast Plan in February 1987. The plan's first phase substantially changed air traffic control routes and procedures in the eastern United States. To date, FAA claims that the plan has contributed to significant reductions in arrival and departure delays, particularly at Newark International Airport. These reductions, however, have been accompanied by complaints from New Jersey residents—including residents more than 30 miles from the airport—about increased aircraft noise, the increased number of flights over their homes, and low flying aircraft, all of which the residents attribute to the plan.

Agency Responsibilities in Regulating Aircraft Noise

FAA's mission is to develop and maintain a safe and efficient system of air transportation for the nation while also considering the impact of aircraft noise. In carrying out its overall mission, FAA has established policies that call for maximizing the capacity of the air transportation system through optimum use of the nation's airspace and ensuring fair and equitable access to the nation's airports with a minimum of federal constraints and intervention. Where local airport operators establish restrictions on access—including noise-related restrictions—FAA's policy is to ensure that they are not an undue burden on interstate or foreign commerce, are not discriminatory, and are not arbitrary or capricious.

In terms of the federal government's role in regulating aircraft noise, FAA has the ultimate authority and responsibility to regulate aircraft for noise abatement purposes and to ensure compliance with the National Environmental Policy Act. Although the Environmental Protection Agency (EPA) does not have any direct authority to regulate aircraft noise, it is required to consult with FAA and recommend noise regulations for aircraft. FAA is required to consider these proposals but has the authority to accept, modify, or reject them. Thus, the authority for actually regulating aircraft noise remains with FAA.

EPA is responsible for reviewing and commenting on all environmental impact statements documenting major federal actions that affect the environment. The key substance of an environmental impact statement includes

(1) the purpose and need for the action in question,

(2) alternatives to the proposed action,

(3) the probable impact of the action on the affected environment,

(4) a discussion of the problems and objections raised by other federal agencies, state and local entities, and citizens in the review process, and

(5) the environmental consequences as a result of taking the action.

To determine whether or not an environmental impact statement should be prepared, an agency performs an environmental assessment that concisely describes the environmental impacts of a proposed action and its alternatives. If the agency concludes on the basis of the assessment that the proposed action will not have a significant impact on the environment, a "finding of no significant impact" shall be prepared and combined with the assessment; otherwise, the impact statement must be prepared. An agency must involve environmental agencies, applicants, and the public, but only to the extent practicable. The environmental assessments must be made available to the public upon request and notices should be provided to state and area-wide clearinghouses. Thus, an agency needs EPA's involvement only if it prepares an environmental impact statement.

For the Expanded East Coast Plan, however, FAA did not prepare either of these documents. Therefore, EPA did not review or comment on the impact of the plan.

The Port Authority of New York and New Jersey, the proprietor of the New York area's three principal airports, is primarily responsible for planning and implementing actions to reduce the effects of noise on residents near the airport. Such actions include noise abatement ground procedures, land acquisition, improvements in airport design, optimum site location, and restrictions on airport use. In a letter dated July 24, 1987, to two Members of Congress from New Jersey, the Port Authority said that the areas experiencing noise as a result of changes associated with the Expanded East Coast Plan are not within the areas affected by

the Port Authority's noise abatement efforts. It also stated that the noise effects of the plan resulted from en route flight path changes rather than from aircraft operations in the environs of the airport and, consequently, are the responsibility of FAA.

Exceptions to this position can occur, however, and airport proprietors sometimes join with FAA and use air traffic control procedures to reduce the public's exposure to high levels of aircraft noise. In 1987, for example, the Port Authority proposed changes in procedures for aircraft departing Newark which would reduce the noise impacts for approximately 9,000 Staten Island residents as well as approximately 600 New Jersey residents. The proposed changes would divert aircraft taking off to the south of the airport, directly after takeoff, to airspace over industrial sections of New Jersey in the vicinity of Linden instead of residential areas of Staten Island. The proposed changes resulted from a year-long consultant's study and, according to the Port Authority, would replace procedures in effect since the 1950s when portions of Staten Island were largely undeveloped.

Measuring Aircraft Noise

Individual perceptions of and reactions to aircraft noise vary widely; however, accurately and objectively measuring single noise events and a series of events over time—or cumulative exposure to noise—is readily achievable. FAA employs a cumulative noise measurement called Ldn—yearly day-night average noise measurement—to study land use compatibility around airports and to determine if noise levels are high enough to qualify a community for federal noise abatement assistance.[1] While Ldn is widely used and correlates well with other noise measures, it has been criticized on several grounds. The Ldn for a specific vicinity can be measured by taking actual noise readings and converting them to a Ldn value or can be derived by using a formula and a series of assumptions and facts regarding the conditions at the vicinity in question.

[1]FAA has a multi-faceted approach to aircraft noise abatement. First, it promulgates regulations requiring aircraft owners to begin using—on a fixed timetable—quieter aircraft engines. Second, it establishes maximum noise levels allowable during takeoff and landing, by type of aircraft. Third, it provides financial assistance for local noise compatibility studies and noise abatement programs in areas around airports where noise levels are deemed incompatible with residential land use because they are too high. Abatement activities may include soundproofing buildings, purchasing land, changing land uses, and relocating people.

Ldn Is Widely Accepted As an Appropriate Standard

Ldn was developed by EPA in the early 1970s as a result of the Noise Control Act of 1972. It is a cumulative noise measurement that averages many single noise events—some of which could be very loud for short time durations and not have a significant effect on the average—to arrive at the average 24-hour sound level experienced over a year's time at a specific location. The 24-hour sound level is measured for the period from midnight to midnight after adding 10 decibels to nighttime noise events from 10 p.m. to 7 a.m.[2] The 10-decibel correction is applied to nighttime intrusion to account for increased annoyance resulting from noise during that period.

Through the Aviation Safety and Noise Abatement Act of 1979, the Congress mandated that FAA, in consultation with EPA, adopt a single noise measurement system for aircraft noise. FAA carried out this mandate by selecting Ldn as its standard. In measuring aircraft noise, Ldn takes into account flight paths, number of operations, runway utilization, the time of day, noise duration, and flyover noise associated with a given aircraft. Ldn can be used to measure various kinds of noise, including traffic, background, and aircraft noise. In addition to its use by FAA, it is employed by the Federal Highway Administration, Department of Defense, EPA, Department of Housing and Urban Development, and Veterans Administration.

How the Ldn 65 Noise Threshold Was Established

FAA uses noise levels stated in terms of Ldn in determining with what uses—including residential, commercial, and industrial activities—land around airports is compatible. A value of Ldn 65 is the threshold above which federal agencies consider land incompatible for residential use, including schools and hospitals. In arriving at Ldn 65 as the standard against which to measure for determining land compatibility, the federal guidelines for noise control had to balance two primary considerations: the environmental effect of noise on various activities (sleeping, communicating, convalescing, learning) that would take place on a piece of land, and the economic effects (ability to qualify for a mortgage, need to soundproof building interiors, property resale value) of declaring land incompatible with certain uses. FAA estimated in 1985 that about 5 million Americans live in areas where the Ldn is 65 or greater due to airport noise. To put this noise level in perspective, the 65-90 dBA range includes the noise level produced by an automobile 50 feet away traveling at 60 miles per hour (65 dBA), a household vacuum cleaner at 10

[2]A decibel is a unit of sound pressure used to measure noise.

feet (69 dBA), or the noise perceived by the operator of a printing press in a printing plant (86 dBA).

The Ldn 65 threshold is the consensus of numerous studies that considered the effects that noise has on human beings, such as interfering with speech, sleep, and other activities. Many of these studies related Ldn levels to levels of community annoyance. One of the most informative of these studies, done in 1963, reported the results of extensive examination of community response to aircraft operations at London's Heathrow Airport. The study showed the relationship between Ldn and the percent of the population disturbed in various activities, including sleep, relaxation, conversation, and television viewing. From this information, a curve was developed that showed that at Ldn 65 approximately 30 percent of the people surveyed find the noise unacceptable for residential living. In another document produced by EPA, a relationship was established between Ldn levels and the percentage of people subjected to these levels who became highly annoyed as a result.

In addition to the above studies, FAA's Ldn 65 guideline can be traced to documents published in 1964 for land use planning with respect to aircraft noise. On the basis of case histories involving aircraft noise problems at civilian and military airports, a relationship was deduced between composite noise rating (a measurement used at that time which correlates highly with Ldn) for aircraft noise environments and complaint behavior to be expected in typical residential neighborhoods. At Ldn 65, complaint behavior includes legal actions and threats of legal action because of aircraft noise. While these analyses may not definitively describe the noise tolerance of the citizens of the United States at this time, they illustrate the general outlines of the effects of the national noise standard of Ldn 65.

Criticism of Ldn

Despite its use as the national noise standard, Ldn has been the subject of criticism. One common criticism is that the averaging process that is an essential part of Ldn's methodology dilutes high levels of intermittent noise that may be experienced at various times during a 24-hour period. For example, 30 overflights of aircraft that each reach 83 dBA[3] (approximately equal to the noise level within a typical city bus) during the

[3]An A-weighted decibel gives the greatest weight to those components of noise that lie in the frequency range where most of the speech interference resides and reflects the greater annoyance to the human ear of higher sound frequencies.

hours of 7 a.m. to 10 p.m. will result in an Ldn of about 60,[4] well below the level considered incompatible with residential land use. Another criticism of Ldn is that it does not account for seasonal variations in aircraft noise because it presumes that climatic differences do not have a significant impact upon annoyance experienced. That is, the effective amount of noise heard will be different in a typical northern-moderate climate where the open window, out-of-doors living season may average fewer months of the year than in a warmer climate.[5] Nevertheless, FAA believes that Ldn should remain the standard measure, given its long history and broad acceptance and that research has offered no strong alternative to date.

FAA's Development of the Expanded East Coast Plan

FAA designed the Expanded East Coast Plan as a comprehensive revision of air traffic control routes and procedures in the eastern United States. The plan's primary purpose is to reduce air traffic delays at the New York metropolitan area's three major airports. Before the plan's implementation, air traffic delays at these airports accounted for 30 percent of all reported delays nationwide.

In addition to reducing current delays, FAA developed the plan to accommodate projected growth in air traffic operations and to avoid saturating the national airspace system. According to FAA, airspace saturation along the East Coast has restricted the movement of air traffic into and out of the New York metropolitan area, and the resulting congestion has caused delays there and in other parts of the country. FAA also stated that the primary reason for this problem was the absence of an effective airway and route structure that would make more efficient use of the available airspace.

FAA began developing the plan in March 1981 by reviewing airspace procedures in the New York metropolitan area. In 1983, the effort was enlarged to study the East Coast traffic flows between Boston and Miami, and in 1984 the scope was further expanded to include the area bounded by Miami, Atlanta, Boston, and Chicago. In 1984, FAA's Air Traffic Control Service in Washington appointed a national project manager and designated program coordinators for each of the four involved FAA regions. In 1985, the FAA Eastern Region established a program

[4]Karl Kryter, The Effect of Noise on Man, p. 621.

[5]Kryter, p. 587.

office dedicated exclusively to coordinating the plan's development and implementation.

Through the plan, FAA is seeking to alleviate many of the problems associated with airspace saturation. Some of the main features of the overall plan follow:

- An increase in the number of departure and arrival routes for Kennedy, LaGuardia, and Newark airports.
- Changed procedures to allow for higher arrival altitudes and speeds coupled with optimum descent profiles to approach courses.
- Less restrictive takeoffs and ascents to higher initial altitudes so that pilots are free to climb more rapidly to more fuel efficient cruising altitudes, thus saving both time and fuel.
- Development of a "fast track-slow track" concept by separating routes for turboprop aircraft from the faster jet aircraft.

Taken together, FAA designed these features to reduce airspace and airport congestion and resulting air traffic delays by (1) creating more avenues for getting to and departing from the area's airports, (2) adopting procedures to expedite takeoffs and landings, and (3) allowing aircraft to take full advantage of their individual performance capabilities and bypass slower aircraft.

The Expanded East Coast Plan was implemented in phases; phase I went into effect in February 1987 and phase II in November 1987. FAA made additional changes in March 1988. The overall plan increased departure routes for Kennedy, LaGuardia, and Newark airports from 17 to 27, while increasing arrival routes from 9 to 12. In addition, many routes were realigned and are perceived from the ground as being new routes.

Since the implementation of phase I, FAA has reported that delays at the three New York area airports have fallen by 34 percent. Newark airport in particular reported a decrease in delays of 64 percent. These figures reflect delay reductions for the period from February 12 to April 30, 1987, compared with a similar period in 1986. FAA attributes the reduced delays to the Expanded East Coast Plan. However, other factors may also have contributed to reducing delays at Newark airport during this period. For example, one major airline—People Express—that had been using Newark as its hub, cut back its flights at Newark due to financial difficulties. Further, with the Department of Transportation's encouragement and grant of antitrust immunity, airlines began in January 1987 to discuss among themselves ways of scheduling their flights

so that departures and arrivals would be more evenly spaced throughout the day. The intended effect of this is to reduce the number of aircraft trying to depart or arrive at the same time, thus reducing congestion and delays. FAA officials have not, however, distinguished separate benefits for each of these factors. Therefore, the extent to which delays have been reduced because of the plan compared to other factors is not known.

FAA has begun developing a plan to address congestion and delays in another part of the country. Called the West Coast Plan, FAA's new routes and procedures will go into effect first in the Los Angeles area and will include redefining airspace, consolidating facilities, and establishing new routes over the water and through military airspace. According to FAA officials, the objectives of the West Coast Plan are to maintain safety and improve air traffic flow while significantly reducing the scheduled airlines' $8.5 million per day estimated cost of delays in southern California. FAA officials also told us that a plan with similar objectives is being formulated for the midwest region of the country, focusing on the Chicago area.

Noise Complaints by New Jersey Residents

New Jersey residents complained in many directions and at many times about increased aircraft noise after phase I of the plan went into effect. In addition to complaints from areas close to Newark airport, such as Cranford, New Jersey, complaints have come from communities such as Long Valley that are 30 miles and more from the airport. Complaints have been directed to the Port Authority of New York and New Jersey; the New Jersey Department of Environmental Protection; and elected officials at the local, state, and federal levels. While the complaints have focused on increased aircraft noise, they have attributed the noise to increased flight frequency, lower aircraft altitude, and the late hours that aircraft fly over their homes. Complaints have also detailed the resulting effects the noise has had on their daily lives, such as disturbing sleep and interfering with conversation. As a result, citizens groups and local governmental units initiated organized actions including forming an organization called "People Against Newark Noise" to protest the noise in central and western New Jersey, passing resolutions expressing concern over noise attributed to the Expanded East Coast Plan, and forming an ad hoc task force consisting of FAA and Port Authority officials, area legislators, citizen groups, and a representative of the aviation industry to resolve the noise problem in the affected areas.

Objectives, Scope, and Methodology

On July 2, 1987, Representative Florio of New Jersey asked us to review enforcement of federal noise control statutes, including those covering aircraft noise. Subsequently, in a July 9, 1987, letter, six other Members of Congress from New Jersey (with a seventh joining them shortly thereafter) requested that we examine various aircraft noise-related issues associated with the FAA's implementation of the Expanded East Coast Plan. Based on these requests and as discussed and confirmed by letter with each Member's office, we agreed to

- determine the responsibilities, under federal law, of EPA, FAA, and the Port Authority of New York and New Jersey with respect to environmental concerns raised by FAA's Expanded East Coast Plan and how these responsibilities were carried out;
- review the development of Ldn as the standard measurement for determining the cumulative exposure of individuals to noise, including aircraft noise;
- describe the changes in air routes, en route altitudes, and air traffic in New Jersey resulting from the p
- determine the rationale for the "3,000-foot rule" as a threshold above which air route and procedure changes do not require environmental assessments or impact statements; and
- review the methodology being used by the Port Authority in its survey of the plan's noise impacts.

We reviewed pertinent federal laws, regulations, and FAA orders relating to aircraft noise standards and control. We also reviewed documents describing the Expanded East Coast Plan, selected studies of aircraft noise over New Jersey, complaint letters, and materials on how noise is measured and what impacts noise has on individuals. We interviewed officials at FAA and EPA headquarters; the FAA Eastern Region, including the New York Terminal Radar Approach Control; the New Jersey Department of Environmental Protection; and the Port Authority of New York and New Jersey. In addition, we contacted individuals representing the New Jersey Assembly Airport Noise Abatement Study Committee, People Against Newark Noise, and selected residents of New Jersey who had complained about noise attributed to the plan.

To determine the responsibilities of EPA, FAA, and the Port Authority for the environmental review of actions such as the plan, we reviewed pertinent provisions of the National Environmental Policy Act, the Clean Air Act, the Noise Control Act, and the Aviation Safety and Noise Abatement Act of 1979. To determine how these responsibilities were carried out, we reviewed provisions of FAA's order implementing the National

Environmental Policy Act, and determined how FAA reviewed the plan from an environmental perspective and the rationale for those actions or lack of action. We also discussed the environmental review of the plan with FAA, EPA, and Port Authority officials.

Our review of the development of Ldn as the standard measurement for determining the cumulative exposure to aircraft noise included reviewing textbooks on noise and various federal agency publications, including those from FAA and EPA, and materials from the Library of Congress and the New Jersey Department of Environmental Protection. In addition, we interviewed EPA and FAA officials, including an FAA official who was a former EPA employee involved in the development of Ldn.

We found information on the changes in air routes, en route altitudes, and air traffic in New Jersey resulting from the plan in FAA documents describing those changes and obtained additional information through discussions with knowledgeable officials at FAA's Eastern Region. We limited our analysis to changes resulting from phase I of the plan because those were the changes in effect at the time we started our review and the basis for complaints existing at that time.

To graphically depict departure and arrival routes both before and after phase I of the plan was implemented, we engaged a cartographer who worked with FAA in preparing maps delineating the changes in routes over New Jersey. We relied on FAA to provide correct information to the cartographer, and FAA officials subsequently approved the depicted routing as being correct. For illustrative purposes, the graphics include some communities from which noise complaints were received.

In collecting information on FAA's rationale for its "3,000- foot rule," we requested documentation supporting the rule, discussed with FAA officials why they believe the rule is still valid, and reviewed and discussed with the Council on Environmental Quality a December 1987 statement on the rule by the Council in a letter from the Council Chairman to Senator Lautenberg.

To review the methodology used by the Port Authority in its noise survey, we examined the preliminary study approach set out in the agency's request for proposal, a critique of that approach prepared by the New Jersey Department of Environmental Protection, and the final request for proposal sent to 23 contractors. We also obtained and reviewed the study methodology put forth by the consultant who was awarded the contract. We checked this methodology for reasonableness

and consistency with the approach followed in similar studies as well as for its conformance with the Port Authority's study approach.

Our work was conducted from September 1987 to March 1988 and was performed in accordance with generally accepted government auditing standards. We provided a draft of this report to FAA, the Port Authority of New York and New Jersey, and the Council on Environmental Quality. Their written comments are contained in appendixes V, VI, and VII and are incorporated in our report as appropriate.

Route Changes Resulting From the Expanded East Coast Plan Were Exempted From Assessment

The Expanded East Coast Plan changed air routes along the East Coast corridor to reduce en route and terminal delays in the Boston, MA; New York, NY; Miami, FL; Chicago, IL; and Atlanta, GA, areas. As part of this overall plan, aircraft arrival and departure routes, as well as en route altitudes, have changed over New Jersey. Such route changes have consisted of new and realigned routes to and from the three major airports serving the New York metropolitan area. Following a preliminary environmental review, FAA determined that the plan fell within an established categorical exclusion and exempted the plan from further environmental assessment. Opponents of the plan have since argued that given the potentially significant environmental impact resulting from the air route changes, FAA should have conducted a more detailed environmental assessment.

Overview of Changes

The first major change to air routes as a result of FAA's Expanded East Coast Plan was to create in 1985 a dual high altitude route along the East Coast. Since then, FAA's plan for reducing delays and congestion in the New York area—by making changes to air routes and air traffic control procedures—has been implemented in three phases. Phase I went into effect on February 12, 1987, and, compared to later phases, had the most significant effect on New Jersey airspace and, therefore, New Jersey residents.[1] Air routes over New Jersey before and after phase I of the plan went into effect are illustrated in figures II.1 and II.2 (arrivals) and figures II.3 and II.4 (departures). Changes in en route altitudes for aircraft flying over various New Jersey communities are depicted in table II.1.

FAA officials said that phase I involves three new departure routes, two new arrival routes, and six "realigned" routes over New Jersey. A realigned route is a changed route which still has one point in common with the original route. A "realigned" route suggests a minor change to the structure; however, as perceived on the ground, this type of change can have just as much effect on the environment as new routes. Comparing figures II.1 and II.2, one such change appears to have occurred in the Marlboro/Freehold area. An inbound route that flew directly over Marlboro before the plan now flies over an area about midway between the two towns. This may explain why FAA is receiving many complaints from the Freehold area. The changes to and from LaGuardia, Kennedy, and Newark airports were as follows:

[1]Phase II was implemented in November 1987 and the last part of the plan, sometimes called phase III, went into effect on March 10, 1988.

- LaGuardia: three new departure routes with a portion of one of these routes carrying new Newark traffic and two realigned arrival routes.
- Kennedy: three realigned arrival routes.
- Newark: two new arrival routes and one realigned arrival route.

Examples of Changes Over Specific Areas

The new departure routes under phase I brought new and additional air traffic over parts of New Jersey. For example, the three new departure routes carrying LaGuardia traffic, with a portion of one of these routes carrying Newark traffic, were added over the Mendham and Long Valley areas and the area west of Hackettstown. According to the Assistant Manager for Plans and Programs at the FAA's New York Terminal Radar Approach Control,[2] these new routes placed additional traffic over the Mendham and Long Valley areas,[3] while the Hackettstown area received new departure traffic where there was no previous traffic. The Califon area, for example, received new traffic from both LaGuardia and Newark Airports, as shown in figures II.3 and II.4 and table II.1.

Regarding new arrival routes, a new jet route was placed over the Broadway navigational aid station (Long Valley area) at a lower altitude than the previous air traffic.[4] Again, the Assistant Manager told us that Kennedy (propeller driven aircraft) and LaGuardia (jets) previously had arrival routes over the area at 9,000 to 10,000 feet above sea level (which does not take into account the varying altitudes of the terrain). After phase I, these arrivals were realigned away from the area and replaced with a new Newark jet route arriving at an altitude of 7,000 to 9,000 feet above sea level. The Assistant Manager acknowledged that this new jet route should increase the noise over the area because of the lower altitude.

The Assistant Manager also said that changes were made in arrival routes and altitudes over Cranford, a community close to Newark airport. Before phase I of the plan, air traffic for the three area airports arrived over Cranford at between 2,500 and 9,000 feet, with Newark traffic arriving at between 2,500 and 4,000 feet above sea level. After phase I, air traffic for Kennedy and LaGuardia was realigned elsewhere, leaving the Newark arrivals in place. However, the elimination of the

[2]A terminal radar approach control facility is responsible for controlling air traffic for airports within a specified area by ensuring safe separations of aircraft and the orderly flow of incoming and outgoing traffic.

[3]There was an existing Newark route.

[4]Navigational aid stations are used by pilots to establish their course.

New York traffic was offset by increased Newark traffic due to airport growth. Therefore, the increased air traffic at a lower altitude may at least partially explain why a number of complaints originated in the Cranford area.

FAA officials pointed out that the routes (lines) shown in figures II.1 through II.4 are general flight tracks that, for planning purposes, can be assumed to be approximately 8 miles wide and that routes are followed most of the time. According to FAA officials, the route of an aircraft depends on such items as air traffic congestion, weather conditions, and pilot/air traffic controller turning error. In stormy conditions, for example, aircraft can fly above, below, or around the storm to avoid turbulence, as long they abide by standards for separation from other aircraft and other pertinent airspace procedures.

Figure II.1: Arrivals Over New Jersey Before Phase I of the Expanded East Coast Plan

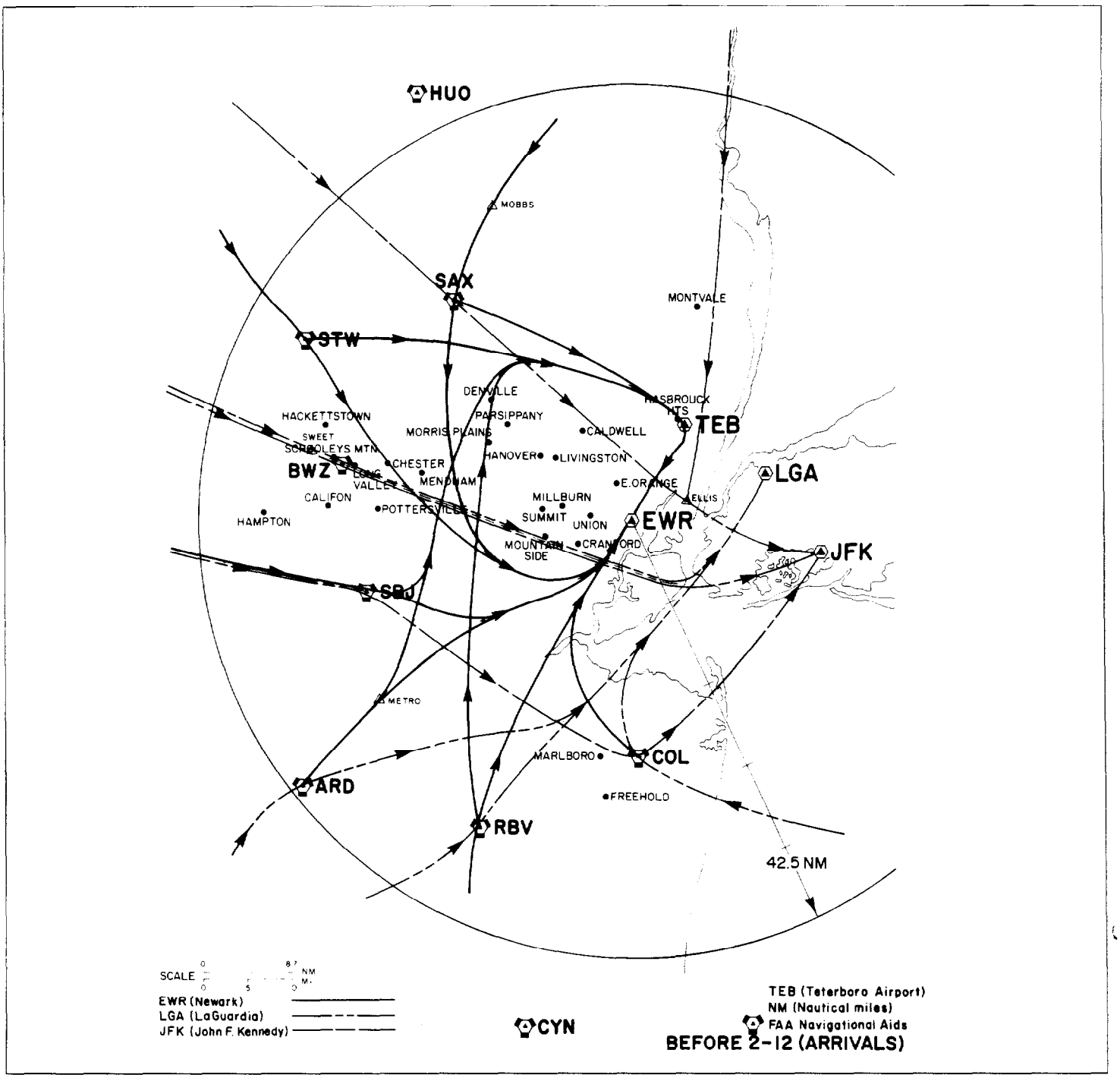

Figure II.2: Arrivals Over New Jersey After Phase I of the Expanded East Coast Plan

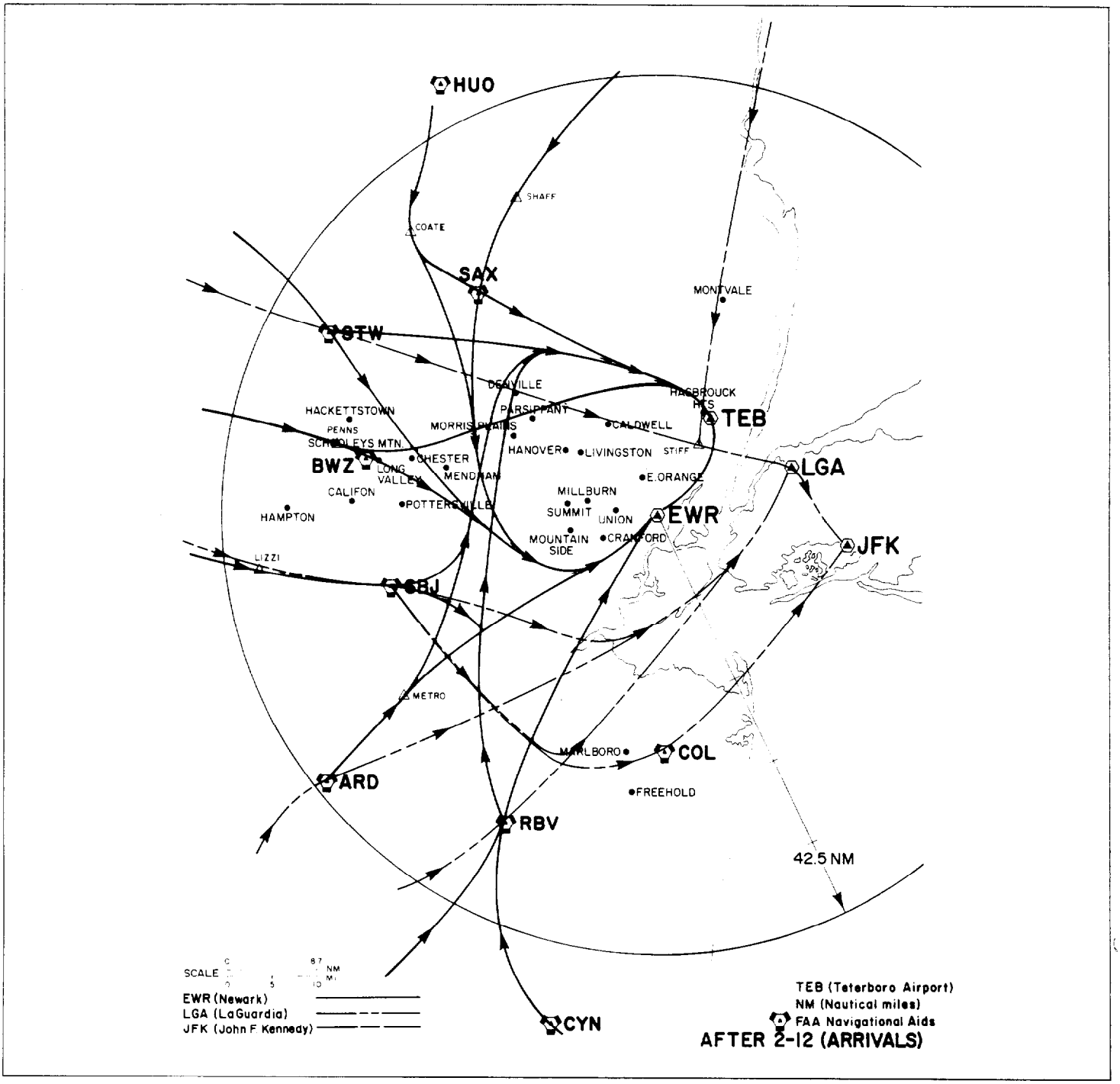

Figure II.3: Departures Over New Jersey Before Phase I of the Expanded East Coast Plan

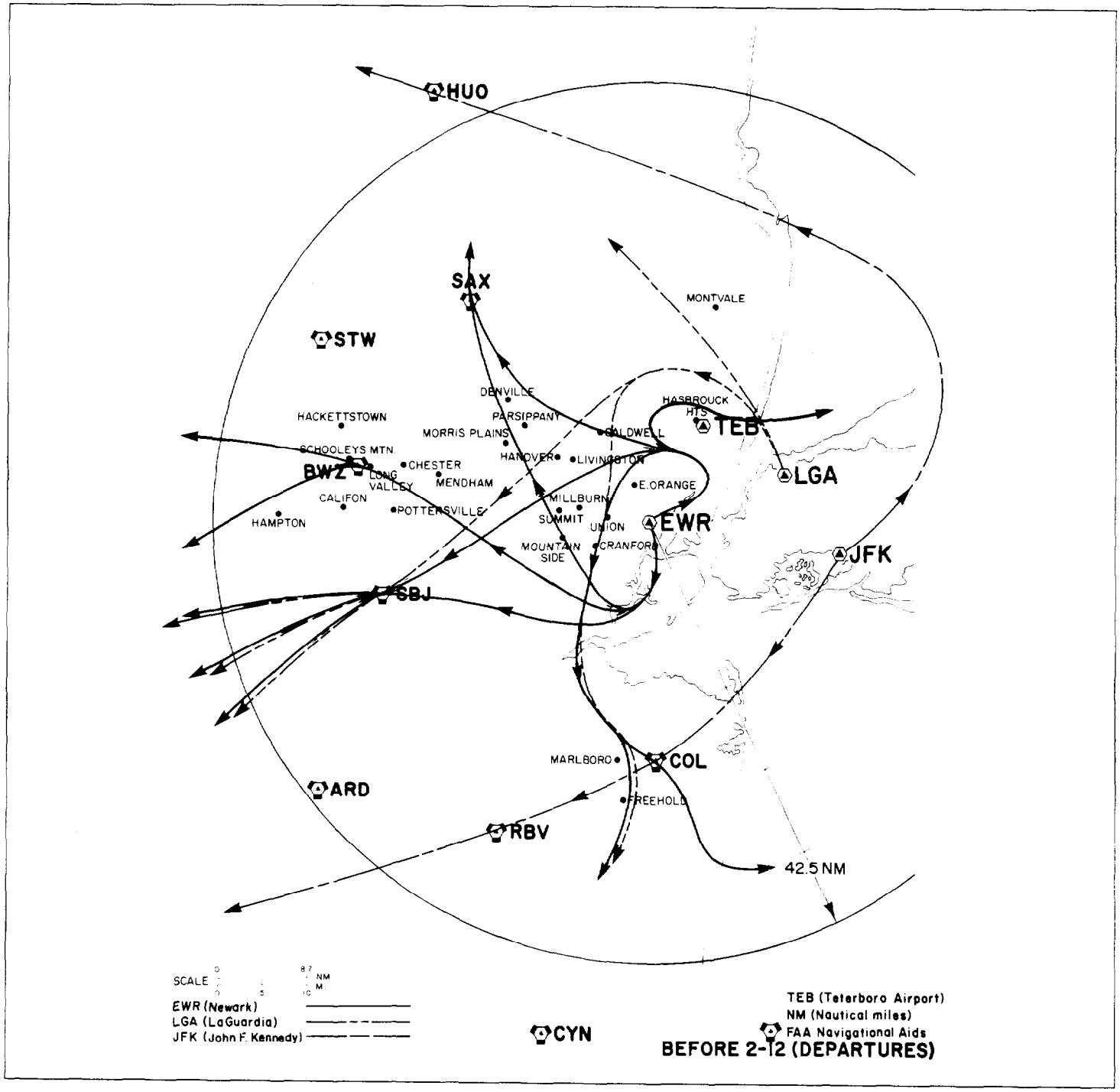

Figure II.4: Departures Over New Jersey After Phase I of the Expanded East Coast Plan

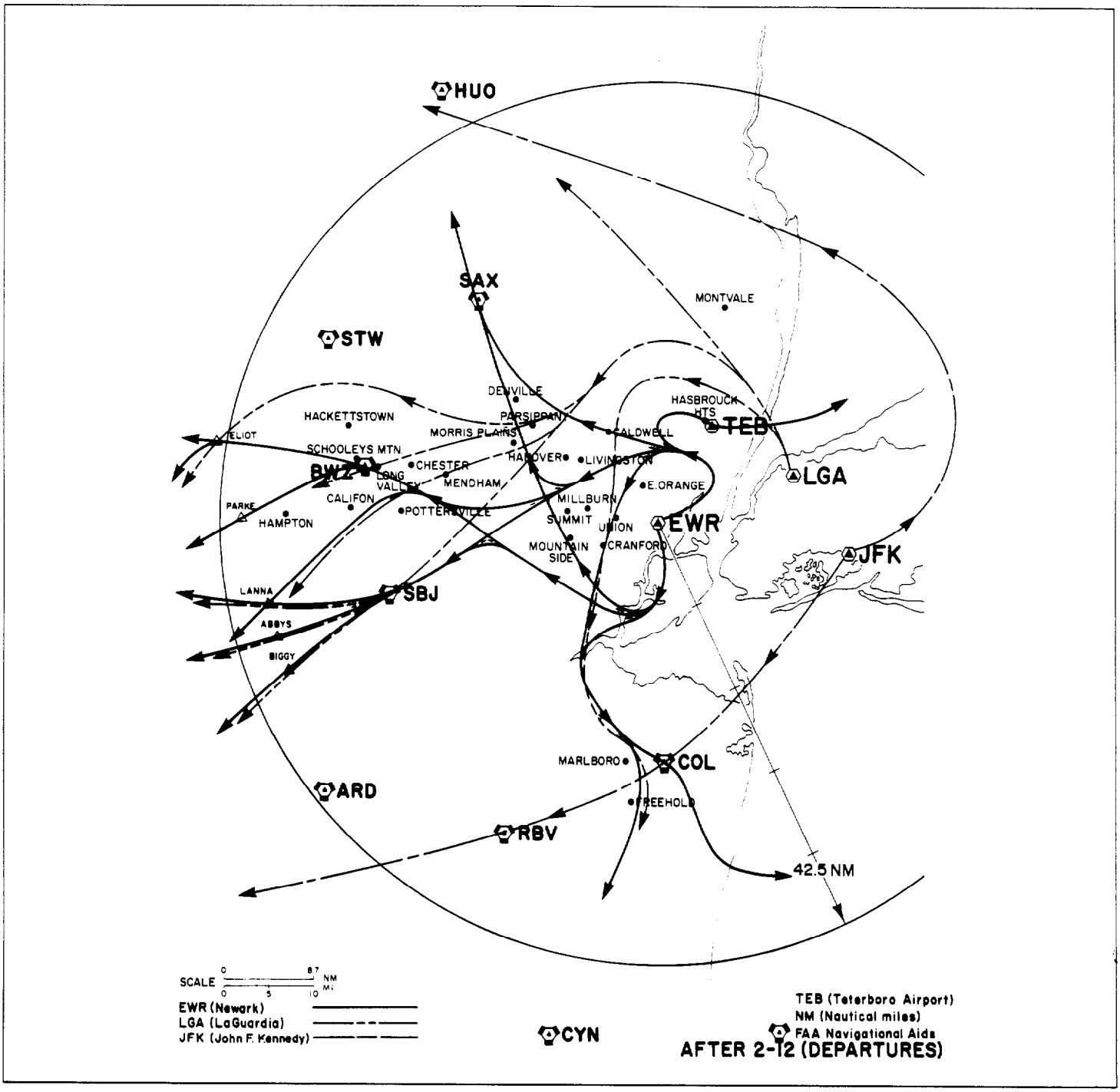

Table II.1: Altitude Range Changes Over New Jersey (Altitude ranges in thousands of feet at mean sea level)

	Arrivals		Departures	
Town	**Before**	**After**	**Before**	**After**
Caldwell	4–6/ 15+	NC	6–14	6–17
Califon	NA	NA	NA	11–17
Chester	9–10	6–7	4–7	11–17
Cranford	2.5–9	2.5–4	3–6/11–14	NC
Denville	4–6	NC	8–14	8–17
East Orange	2.5–4/ 15+	2.5–4	3–6/11–14	NC
Freehold	NA	3–4[a]	6–17	NC
Hackettstown	5–7	NC	NA	11–17
Hampton	NA	NA	NA	11–17
Hanover	4–6	NC	8–14	8–17
Hasbrouck Hts.	1.8–5/ 15+	NC	1.8–5/7–14	NC
Livingston	4–6	NC	6–14	6–17
Long Valley	9–10	7–9	4–7	11–17
Marlboro	3–5	3–4[a]/4–6[b]	6–17	NC
Mendham	9–10	6–7	4–7	11–17
Millburn	4–6	NC	6–14	6–17
Montvale	15–19	15–19	6–14	NC
Morris Plains	4–6	NC	8–14	8–17
Mountainside	4–10	4–6	6–14	6–17
Parsippany	4–6	NC	8–14	8–17
Pottersville	9–10	6–7	NA	11–17
Schooley's Mtn.	9–10	7–9	4–7	11–17
Summit	4–10	4–6	6–14	6–17
Union	2.5–4	NC	3–6/11–14	NC

[a]= Props only

[b]= Jets only

NC = No changes

NA = Not applicable

FAA Exempted the Plan From Environmental Assessment

FAA Order 1050.1D—Policies and Procedures for Considering Environmental Impacts—implements FAA's responsibilities under the National Environmental Policy Act and the related regulations promulgated by the Office of the President's Council on Environmental Quality. FAA published its order in the Federal Register, solicited and received public comments, and considered those comments in developing the order's final version. The order requires that an environmental assessment be prepared for a proposed action if (1) a decision has not been made to prepare an environmental impact statement or (2) the proposed action

has not been classified as a categorical exclusion. Even if an action is covered by a categorical exclusion, the order requires that an environmental assessment be made if certain extraordinary circumstances are present.

FAA performed an informal (limited documentation was prepared) review of the environmental considerations regarding its Expanded East Coast Plan and determined that, because the planned route changes were all to occur above 3,000 feet, these actions fell within an established categorical exclusion; therefore, no environmental assessment was deemed required and none was performed. The Council on Environmental Quality had previously approved the categorical exclusion that FAA invoked—"Instrument Approach Procedures, Departure Procedures and En Route Procedures Conducted at 3,000 Feet or More Above Ground Level"—in 1979. In that regard, FAA believes that its experience has shown that aircraft noise generated at altitudes above 3,000 feet does not significantly affect the quality of the human environment. However, in comments provided on a draft of this report, the Council's Deputy General Counsel pointed out that the Council's approval of categorical exclusion regulations does not mean that the excluded activity can be conducted without significant impacts on the quality of the human environment. The Council attempts to ensure that FAA has adequately addressed the anticipated effects of its actions and that it has followed procedures in excluding particular actions.

FAA's Rationale for the 3,000-Foot Rule

Officials in FAA's Office of Environment and Energy explained that documentation on how the 3,000-foot rule was developed was not available and that they were unsure as to how the rule was derived. This was because FAA personnel responsible for developing the first version of FAA's order implementing the National Environmental Policy Act, some 15 years ago, are no longer with the agency.

Nevertheless, the manager of FAA's Noise Abatement Division, Office of Energy and Environment, provided what he believed to be a logical explanation for how the 3,000-foot rule came into being. He said that the rule is based on the assumption that, at altitudes of 3,000 feet or higher, aircraft noise heard on the ground will not exceed a yearly cumulative average of Ldn 65, even under the most crowded skies. He believes that the criterion is still valid and used data from the Pittsburgh airport (the necessary data from the Newark airport were not available) to support his opinion. (Pittsburgh's aircraft mix and number of operations are similar to Newark's.) First, assuming that the predominant aircraft is a

Boeing 727, the average distance required to clear a 3,000-foot altitude is 38,000 feet from the start of the takeoff roll. Second, the Pittsburgh airport's Ldn 65 noise contour is located from 31,000 to 36,000 feet from the terminal, depending on which runway is used. He therefore concluded that, within the area around the terminal where noise levels are greater than Ldn 65, aircraft are flying at altitudes less than 3,000 feet.

In December 1987, Senator Frank R. Lautenberg of New Jersey asked the Council on Environmental Quality to (1) review FAA's 3,000-foot criterion used to exempt proposed actions from an environmental assessment and (2) assess the need to modify it. In its response, the Council stated that it has not been demonstrated that FAA's categorical exclusion for arrival and departure flight paths at or above 3,000 feet is inappropriate or that the categorical exclusion was not applied correctly when the Expanded East Coast Plan was implemented. The Council asked Senator Lautenberg to provide any additional information on this issue that would be of concern to the Council. The Council added that, even though this action is eligible for a categorical exclusion, it did not absolve FAA from the responsibility to prepare an environmental assessment or impact statement if there were environmental impacts or other extraordinary circumstances.

An Environmental Assessment May Be Warranted

Regardless of categorical exclusions like the 3,000-foot rule, the Council on Environmental Quality requires federal agencies' regulations to provide for extraordinary circumstances in which a normally excluded action may have a significant environmental impact, thus necessitating the preparation of an environmental assessment or impact statement. FAA's policy provides for such extraordinary circumstances and cites, for example, an action that is likely to (1) be highly controversial on environmental grounds, (2) have a significant impact on noise levels of noise sensitive areas, or (3) directly or indirectly affect human beings by creating a significant impact on the environment. Should such extraordinary circumstances exist, FAA policy directs that an environmental assessment be done which describes the environmental impacts of the proposed action. FAA officials stated that, before implementing the plan, they did not foresee any significant noise impacts over New Jersey or any controversies resulting from the plan and, therefore, did not assess the environmental impact of the plan. Since the plan has already been implemented, FAA's extraordinary circumstances policy, which focuses on proposed actions, is no longer strictly applicable. Nevertheless, FAA can still prepare an environmental assessment. Under Council on Environmental Quality regulations, "agencies may prepare an environmental

assessment on any action at any time in order to assist agency planning and decisionmaking." Furthermore, the Deputy General Counsel of the Council on Environmental Quality told us that, in view of current public outcry over the effect the plan has had on New Jersey residents, it would be reasonable for FAA now to conduct an environmental assessment of the plan.

The New Jersey Department of Environmental Protection questioned why FAA had not done an environmental assessment as required for significant federal actions. The department pointed out that the magnitude and geographical extent of national airspace affected by implementation of the plan warranted an environmental assessment based on the extraordinary change in airspace which, in the department's opinion, was without precedent. In support of that opinion, the department quoted an FAA publication that described the plan as the most extensive revision in domestic air traffic procedures in 20 years. The department also pointed out that, even if an environmental assessment was not technically mandated, it would have been prudent to perform one before implementing as significant an action as the plan. That assessment could have included a thorough examination of all alternatives and their associated impacts, including the identification of affected areas, an estimation of the number of people affected, and the expected levels of noise. In this regard, the official responsible for New Jersey's noise control program stated that the environmental impact statement process could have benefited FAA and the public.

Actions Taken in Response to Complaints About Noise Impacts of the Plan

Although FAA performed no environmental assessment of the Expanded East Coast Plan before implementing it in February 1987, government agencies have taken a number of actions since then in response to noise complaints. FAA and the New Jersey Department of Environmental Protection have completed analyses of noise levels in one or more communities affected by noise attributed to the plan, and in March 1988 the Port Authority of New York and New Jersey contracted for a survey that will measure noise levels in communities close to and distant from Newark airport. In addition, FAA has begun to revise procedures that would reduce noise over New Jersey communities. For example, whenever possible, flights departing Newark are directed over random routes instead of a single route, thereby dispersing the noise over a larger area.

Actions FAA Has Taken in Response to Complaints

FAA has taken many actions in response to the repeated complaints by the residents of New Jersey that the Expanded East Coast Plan has disrupted their lives and should be discontinued. FAA officials have attended and testified at hearings, written letters to residents attempting to explain agency policy, and other information has been given to describe various details of the plan. Two of the most significant actions, however, have been FAA's 1-day study of noise levels over Long Valley and recent guidance given to air traffic controllers that should help them more evenly distribute aircraft noise over the state.

FAA's Analysis of Predicted Noise Levels at Long Valley, New Jersey

In June 1987, the FAA Eastern Region asked the FAA's Office of Environment and Energy to measure the noise exposure caused by the plan in a selected New Jersey community. FAA selected Long Valley, a town located about 34 miles from Newark airport, because it lies within that part of the state overflown by the new traffic and several noise complaints had come from the Long Valley area.

FAA based its analysis at Long Valley on flight information generated by its Automated Radar Terminal System, which includes type of aircraft, altitude, and the name of the airport where the flight originated. FAA's Integrated Noise Model was used to calculate the predicted aircraft noise based on the flight information.[1] According to FAA, the latest version of this computer model contains a data base of aircraft-specific performance and noise tables for 81 different aircraft. Data were analyzed

[1]This model is a part of the Code of Federal Regulations and is used in performing FAA-funded "Part 150" studies at airports across the country to establish noise contours and land compatibility maps.

for a Thursday in June 1987. A Thursday was selected, according to the study, because it is the busiest day of the week in terms of air traffic.

FAA's analysis showed that 144 flights passed within 2.5 nautical miles of Long Valley on the day analyzed; of these, 124 were commercial jets, 10 were business jets, and 10 were turboprop commuters.[2] The analysis concluded that on this particular day Long Valley was exposed to a low average level of noise—50.5 Ldn—but that this was expected, considering that aircraft passed from 4,800 to 13,900 feet above the community. In fact, according to the integrated noise model data, the noise created by most flights was less than 65 dBA, although for 92 out of the 144 flights the noise ranged between about 60 and 65 dBA. The analysis acknowledged, however, that it did not address what the town's exposure to aircraft noise was before the plan was implemented. Therefore, the analysis could not comment on how much more, if any, noise exists now in Long Valley compared to before the plan.

The analysis also pointed out that an Ldn value of 50 does not necessarily mean that area residents are incorrect in asserting that there has been an impact on their quality of life, especially if there were no overflights before. However, the analysis concluded that change in quality of life must be placed in the context of the final noise levels after the plan's implementation, which, according to FAA, are extremely low when judged against the only aircraft noise/land use compatibility guidelines available, in particular the 65 Ldn guideline.

FAA's Action to Reduce Noise

FAA recently initiated action to reduce noise over New Jersey communities. In a notice dated December 31, 1987, FAA called for all Newark air traffic controllers and supervisors to be briefed on their responsibility for reducing noise over local communities. The notice pointed out that, since implementation of the Expanded East Coast Plan, certain routes have been altered and aircraft have been routed over areas where there were previously very few aircraft. In an effort to reduce noise, the notice specified that whenever possible, especially during the nighttime hours, Newark controllers will

- maximize the use of random routes instead of established ground tracks in order to disperse aircraft over a wider area,

[2]Data for an additional 10 flights could not be used due to either erroneous altitudes or missing flight plan records.

- coordinate with other controllers to use higher altitudes for departures earlier than normal, and
- retain arriving aircraft at higher altitudes until absolutely necessary to begin their descent to the airport.

FAA stated that although these measures will not completely eliminate the noise problems, they are a positive step toward cooperating with local communities. Because noise levels across the state were unknown before these measures were initiated, their effectiveness in reducing noise cannot be determined. One FAA official noted that if these measures are successful in reducing noise over New Jersey, residents probably will not notice the effect because, once their awareness of noise has been raised, they will not be satisfied until all the aircraft are gone from their sky.

New Jersey Department of Environmental Protection's Airport Noise Field Investigation

A study by the state of New Jersey measured the noise level of single aircraft flights over selected areas affected by noise from planes traveling to and from Newark International Airport. The study pointed out that airport noise has always had an impact on communities in the vicinity of the airport but, since the inception of the Expanded East Coast Plan, distant communities have begun to complain about an increase in jet noise.

The analysis was done in August 1987 at 17 sites: 1 site was 1.5 miles from the airport, 8 sites were between 5 and 9 miles from the airport, and 8 sites were between 11 and 34 miles from the airport. Approximately one-half hour was spent at each site recording single-event noise levels of passing aircraft. Before any aircraft passed over, the neighborhood noise level was recorded. No readings were taken at two sites because of high noise levels caused by rush hour motor vehicle traffic. The analysis pointed out, however, that airplane noise was audible at those sites.

The department acknowledged that this study could not be used for comparison with established FAA guidelines for aircraft noise because FAA uses cumulative event yearly averages (Ldn) and not single-event noise levels. Still, based on the difference between noise levels without aircraft and levels when aircraft passed over, it concluded that (1) noise levels near the airport clearly require reduction and (2) noise levels at the distant sites are considerably lower than those near the airport, but they are still much higher than the neighborhood noise level is without any aircraft passing overhead.

Port Authority's Noise Survey

The Port Authority's study of aircraft noise will establish the noise impact of Newark airport's operation in the vicinity affected by air traffic changes made to date by the plan. In describing the objectives of the survey, the Port Authority acknowledged that the plan's implementation has been associated with a number of noise complaints in northern and western New Jersey, principally from communities that had experienced little or no overflight or previously may have been overflown at higher altitudes. The survey was initiated in response to requests from these communities and various elected officials, including several members of New Jersey's congressional delegation. In March 1988, the Port Authority awarded a contract, and a final report is anticipated by September 1988.

Port Authority's Survey Approach

According to the final request for proposal—which the Port Authority sent to 23 contractors—there are two main components to the survey. The first component involves developing Ldn 65 and 75 contours for Newark airport over the most recent 12-month period using FAA's Integrated Noise Model and aircraft distribution and flight records provided by the Port Authority. The noise contour is the principal tool for analyzing and delineating land use compatibility in the vicinity of airports and represents a line connecting points of equal exposure to noise. After the contours are developed, they will be validated using field measurements of actual noise levels.

The second component of the study involves calculating and measuring the level of noise impact in areas outside the Ldn 65 contour (areas of New Jersey distant from Newark airport). These may include areas from which FAA has received large numbers of complaints since implementing the plan.

New Jersey Reviewed Port Authority's Draft Survey Proposal

New Jersey's Department of Environmental Protection was given the opportunity to review the request for proposal developed by the Port Authority before it was sent to the various contractors. The department expressed concern over the proposed use of Ldn alone to measure noise impacts, claiming that it results in an incomplete picture of the situation because it averages high and low noise levels. Citing 1976 and 1985 studies done for metropolitan Washington, D.C., airports, in which FAA used Ldn and other measurements, New Jersey stressed its position that additional measures of noise are required for the Newark study. The

state pointed out, for example, that nine different noise data measurement techniques were used to express the aircraft noise levels found in the 1985 study.

The department also disagreed with terming Port Authority's proposal a "study" and believed that it is actually a "survey," since the proposal does not define the aircraft noise impacts resulting from implementation of the plan. In addition, the department commented that the proposal should include provisions for including communities north and south of the airport, as well as those west of it as originally proposed, since Newark airport also affects those areas.

Port Authority's Response to the Department's Comments

The Port Authority responded to the department's criticism of Ldn by reiterating that this methodology was adopted by the FAA as the standard for assessing aircraft noise impact. With respect to the "study" versus "survey" issue, the Port Authority stated that the proposed effort would not research or analyze the noise; instead, it would only quantify the noise using the prescribed measures. These results may then become the basis for further, more extensive studies of possible problems.

The Port Authority also made a number of editorial changes to the request for proposal as suggested by the department. For example, the wording of the "Purpose" section was changed to read ". . . establish noise impact . . . both in the area immediately surrounding the airport and in a number of communities around the airport which may have been affected by the air traffic changes made as part of the FAA's Plan." (Underlining added by the Port Authority.)

GAO Review of Proposed Survey Methodology

In March 1988, the Port Authority awarded a $148,000 contract to Harris Miller Miller & Hanson Inc., one of the five firms responding to the request for proposals. The contractor appears to have adequate credentials for carrying out the survey, having carried out prior noise measurement programs and noise modeling studies based on measurements at five major airports across the country and several U.S. naval and marine stations.

The methodology the firm plans to employ appears to coincide with the procedures specified by the Port Authority and includes elements which, in our opinion, will improve the accuracy and usefulness of the survey's results. For example, the contractor plans to

- collect aircraft noise data in May rather than in the relatively colder months of March and April because aircraft are less efficient and, therefore, noisier in warmer temperatures and
- plot not only the Ldn 65 and 75 contours around Newark airport but also the Ldn 60 contour, because this outer contour will be useful in identifying areas where aircraft noise still will be sufficiently high that it will exceed normal levels in quiet neighborhoods.

The Port Authority is also taking several steps to enhance the accuracy, usefulness, and acceptance of study results. For example, since the field measurement program is a critical element of the study, the Port Authority is requiring the contractor to detail its proposed method of validation and to be prepared to defend its proposal in the areas of technical adequacy, accuracy, and cost effectiveness. The New Jersey Department of Environmental Protection has requested that state and federal legislators and local government units provide complaint data to the Port Authority so that this information will be available to the contractor for selecting sites at which noise levels will be measured. The Port Authority has also agreed to allow the Ad Hoc Task Force on the Expanded East Coast Plan to provide oversight of and input to the study process. Finally, while not agreeing to perform a community attitudinal survey, the Port Authority has requested its contractor to provide a cost estimate for such a survey and an opinion on whether an attitudinal survey is warranted.

While these points give us a measure of confidence in the study, we are, nevertheless, concerned about several areas. One pertains to whether the contractor will make sufficient use of citizen complaint data compiled by the Port Authority and FAA. Although the contractor attended a preliminary meeting with the Port Authority, FAA personnel, and other interested parties to obtain the complaint data, no further reference appears in the firm's methodology as to specifically how these data will be used. According to the Port Authority's request for proposal, complaint data, along with details on the Expanded East Coast Plan and actual radar flight tracking data, are to be considered by the contractor in developing recommendations for measurement sites outside of the Ldn 65 contour. Port Authority's monitoring of the contractor's performance should ensure that these complaint data are adequately considered by its contractor in developing those recommendations. In its comments on a draft of this report, the Port Authority said that the contractor will review the complaint data and plot all sources of complaints on a map. The Port Authority explained that this will generally indicate

the affected areas and help identify areas for en route noise measurements.

Another concern we have relates to how the contractor will choose the locations distant from the airport at which to monitor noise. The proposal did not mention whether a standard technique exists for selecting the specific sites and how many to select or how this has been done in the past. In the Port Authority's comments on our draft report, it explained how the contractor would select noise measurement sites close to the airport for the purpose of verifying the noise contour. However, the issue of site selection at greater distances is still open.

Finally, we also share New Jersey's concern that measures in addition to Ldn could be considered by the contractor as it analyzes the raw noise data collected at the field sites. In this regard, the Port Authority has decided, according to its comments on our draft report, to expand the noise survey to include noise measures that give greater weight to the low-frequency component of aircraft noise events. This decision was based on the Port Authority's discussions with a number of noise practitioners who indicated that these low-frequency weighted measurements may help explain the reaction to the plan from areas distant from the airport.

Despite these concerns, because the study appears to follow federal guidelines for this kind of effort and also seems to us to be methodologically sound, we believe that on balance the results should improve the existing basis for making judgments about the effects of the Expanded East Coast Plan.

Conclusions and Recommendations

Conclusions

FAA has attributed the decrease in flight delays being experienced at the three New York metropolitan area airports to the implementation of phase I of its Expanded East Coast Plan. On the other hand, the plan has generated numerous complaints from residents of New Jersey because of the increase in aircraft noise caused by rerouted air traffic. This condition underlines the problem of (1) balancing economic benefits against aircraft noise and (2) developing a solution which mitigates the noise impacts of aircraft while protecting airport access, air traveler convenience, and efficient use of the national airspace system.

From the economic perspective, we believe FAA's claim of reduced delays due to the implementation of the plan requires more substantiation than FAA has provided to this point for it to be accepted without question as the best solution to flight delays. While the plan likely has contributed to reducing delays, FAA has not identified how much of this reduction is directly attributable to the plan. Indeed, other events that have occurred concurrently —the voluntary changes in scheduling by some airlines to reduce congestion and the elimination of hubbing activities of a major carrier at Newark—have also contributed to reducing delays. Furthermore, FAA has not differentiated how much of the plan's incremental operational and economic benefits result from establishing new arrival and departure routes, which bring aircraft at lower levels over residential communities, versus procedural changes intended to expedite takeoffs and landings.

From the noise impact perspective, we believe that FAA could have anticipated that its plan would have had enough of an effect that an environmental assessment would be warranted. This is because the underlying causes of the increased noise—lowered flight altitudes, new and realigned routes, and increased traffic—were known to FAA before the plan was implemented. Therefore, as the agency responsible for regulating aircraft noise, FAA would have been more sensitive to the environmental effects of its plan if it had conducted such an assessment before finalizing and implementing its plan. Anticipated noise levels generated as part of this before-the-fact assessment would have been derived from a computer model using expected flight paths, flight frequencies, and noise signatures of specific aircraft types and, therefore, would not have enjoyed wide credibility. On the other hand, the Port Authority's current study of aircraft noise should be valuable because data collected will reflect actual noise levels and permit more acceptable calculations of noise levels. However, based on the results of FAA's 1-day study of noise over Long Valley, it is likely that the Port Authority survey will show that areas distant from Newark airport are not subjected to noise

levels above the national Ldn 65 threshold. This in itself is not a criticism of the value of the Port Authority's study; rather, it may be due to limitations in the use of established noise measurement standards.

In our opinion, it would be impractical from an economic perspective to immediately revert to pre-plan conditions. If the plan is responsible for the reduction in delays claimed by FAA and, in turn, for the corresponding benefits to the aviation community, then it has achieved its objectives. FAA policymakers must now determine whether these benefits outweigh the plan's environmental effects as they are understood at this time. An environmental assessment would be useful in this determination and, because FAA did not conduct one before the plan, it is reasonable to expect that FAA would prepare one now to take advantage of the ability to collect and use actual noise data. Key components of this environmental assessment would be (1) the actual data generated by the Port Authority's current study and/or other data collection efforts initiated by FAA, (2) the use of several measures, including Ldn, as was done in the National Airport "scatter plan" to measure the environmental effect of new and revised air routes, (3) hearings to obtain the views and experiences of New Jersey residents, and (4) alternative means of achieving the desired reductions in delays at the three major airports around New York City. The results of such an assessment, when combined with the economic benefits due to the plan alone, should improve the information base for determining the merits of the Expanded East Coast Plan and help FAA to judge whether the environmental effects of the plan warrant any adjustment to that plan.

Conducting an environmental assessment is in many cases a judgment call for a federal agency. However, it is an important step in ensuring that all factors are adequately considered before implementing an effort such as major air route changes over populated areas. Therefore, we believe that FAA's planning for route changes on the West Coast or other areas projected to be affected by route or airspace procedure changes would benefit from an assessment as outlined under the National Environmental Policy Act.

Recommendations

We recommend that the Secretary of Transportation direct the Administrator, FAA, to improve the information base available on which to assess the merits of the Expanded East Coast Plan and other such major airspace changes by

- preparing an environmental assessment of the effects of the plan and, if significant impacts from the plan are found, preparing an environmental impact statement;
- making a qualitative determination of which portions of the reduced delays are due to the plan and which are due to other factors; and
- preparing an environmental assessment of any major proposal for making widespread air route or flight procedure changes on the West Coast or in other areas of the country where delays and congestion warrant such changes.

Comments From the Department of Transportation

Note: GAO comments supplementing those in the report text appear at the end of this appendix.

U.S. Department of Transportation

Assistant Secretary for Administration

400 Seventh St., S.W. Washington, D.C. 20590

MAY 20 1988

Mr. Kenneth M. Mead
Associate Director
Resources, Community, and Economic
Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Mead:

Enclosed are two copies of the Department of Transportation's comments concerning the U.S. General Accounting Office draft report entitled, "Aircraft Noise: Implementation of FAA's Expanded East Coast Plan."

Thank you for the opportunity to review this report. If you have any questions concerning our reply, please call Bill Wood on 366-5145.

Sincerely,

Jon H. Seymour

Enclosures

Enclosure

Department of Transportation Reply to

General Accounting Office Draft Report

Entitled: "Aircraft Noise: Implementation

of FAA's Expanded East Coast Plan"

SUMMARY OF GAO FINDINGS AND RECOMMENDATIONS

The General Accounting Office (GAO) draft report states that in carrying out its mission, the Federal Aviation Administration (FAA) must balance its goals of developing and maintaining a safe and efficient air transportation system with its responsibility to minimize adverse environmental impacts on the general public. GAO states that FAA's performance in creating this balance has been questioned by the public opposition and broad-based concern surrounding the implementation of Phase I of FAA's Expanded East Coast Plan (EECP). In response, GAO reports that FAA and others have begun taking actions to measure and alleviate noise attributed to the plan. To date, however, these actions have not caused any significant change in the plan, and results from the New York/New Jersey Port Authority's noise survey will not be complete until September 1988.

GAO states that the underlying causes of the increased noise, lowered flight altitudes, new and realigned routes, and increased traffic over areas where only light traffic occurred before the plan, were known to FAA before the plan was implemented. For this reason, GAO believes that FAA should have expected the negative reaction of New Jersey residents. Armed with this expectation, FAA could have been more sensitive to environmental concerns by conducting an environmental assessment before implementing its plan. The assessment process would have provided more information to the public, allowed a wide range of views to be presented, and surfaced any alternatives to the plan that might have been available. Similarly, subsequent plans to reduce delays and congestion in other parts of the country would also benefit from the assessment process.

GAO believes that noise studies by FAA, the State of New Jersey, and the Port Authority have assisted and will continue to assist in better defining and understanding the aircraft noise problem in New Jersey. These studies could form the basis of a comprehensive environmental assessment which, together with more definitive economic benefits of the various aspects of the plan, would allow FAA to make a more informed judgment on the overall merits of the plan and continue adjusting its plan to optimize the benefits versus noise relationship. In addition, with this information, FAA could better balance its goals in the areas of commerce, safety, and the environment and justify its means of achieving them.

GAO recommends that the Secretary direct the Administrator, FAA, to: (1) improve the information base available on which to determine the merits of the EECP by (a) analyzing the economic benefits to the air travel community resulting from reduced flight delays attributed to the plan, and making the results of this analysis available to the public and (b) preparing an environmental assessment of the effects of the plan; and (2) perform an environmental assessment before making major air route or flight procedure changes on the West Coast or in other areas of the country where delays and congestion warrant such changes.

SUMMARY OF DEPARTMENT OF TRANSPORTATION POSITION

Although GAO has made a conscientious effort to address noise concerns stemming from the EECP, the Department does not concur with GAO's recommendations. We do not believe that an economic analysis of the benefits of the plan is warranted as we believe that it is clear that the plan had a major positive effect on delay reduction.

See comment 1.

GAO states that delay reduction has not been clearly linked to the EECP since it may have been partially due to airline rescheduling to reduce congestion and elimination of the People Express hub operation at Newark. Rescheduling was not uniformly implemented at all of the New York area airports and the People Express operation was not eliminated; it was replaced by Continental Airlines. Because of the differing effects of these actions at individual airports, it is necessary to look at the New York area to determine the plan's effectiveness rather than at just one airport. Further, EECP effectiveness can only be determined for like time periods, before and after its implementation, to factor out weather and holiday effects. For the period of March 12 through April 30, a comparison of 1986 and 1987 data for the three major New York airports shows that, while traffic was down only 5.6 percent, delay was down by 34.2 percent. Traffic and delay statistics indicate that the delay reduction seen after EECP implementation is of such a magnitude that it cannot be explained by small changes in traffic levels. Since no other areawide actions were taken after the EECP, it is clear that the delay reduction was almost entirely attributable to implementation of the plan.

See comment 1.

The GAO report then states that it would be impractical from an economic perspective to immediately revert to pre-plan conditions, but then asks for an analysis of the economic benefits of the plan to the air travel community to improve the information base for determining the merits of the EECP. However, we believe the merits of the plan already have been well established. The GAO itself agrees that it is unrealistic to even consider returning to the pre-plan situation. For these reasons, we disagree with the GAO recommendation to perform an economic analysis of the EECP.

See comment 2.

Regarding an environmental assessment of the plan, GAO concluded that because many important characteristics of the plan were known to FAA before the plan was implemented, FAA could have foreseen that the plan would have a significant effect on some parts of New Jersey and result in controversy. We do not concur with the GAO conclusion. Based on the thousands of higher altitude air route changes which the FAA made prior to implementing the EECP, without any adverse public reaction, there was no reason to expect such reaction to the EECP. Thus, data were not collected to describe the pre-plan environment and there is nothing to compare the post-plan situation with to determine its effect. Without the

See comment 3.

description of the pre-plan situation, the comparative analysis, which is the basis of an environmental assessment, is not possible.

See comment 4.

We cannot yet quantitatively describe a noise problem in central New Jersey. The Port Authority of New York and New Jersey noise measurement program, which is being conducted at Newark Airport and in a number of communities located at different distances from the airport, will provide the data needed to determine that the aircraft noise levels are in central New Jersey. The FAA supports the Port Authority noise study and will continue to work with them and the affected communities to ensure the success of that effort. The FAA is also working with the Attorney General's Office of the State of New Jersey on a similar but smaller study being done in parallel with the Port Authority work. As data become available from these studies, we will be able to assess the post-plan situation and determine if the noise levels are high enough to be a problem.

See comment 5.

GAO's last recommendation is that the FAA perform environmental assessments of major air route or flight procedure changes where delay and congestion warrant such changes. The procedures contained in FAA Order 1050.1D, Policies and Procedures for Considering Environmental Impacts, already state that proposed Federal actions which might otherwise be categorically excluded from environmental assessment shall be the subject of such assessment if they are likely to be highly controversial on environmental grounds or have a significant impact on noise levels of noise sensitive areas. As stated in the GAO report, the Chairman of the Council on Environmental Quality (CEQ) wrote to Senator Frank Lautenberg stating that it has not been demonstrated either that the FAA's categorical exclusion for arrival and departure flight paths at or above 3,000 feet is inappropriate, or that this categorical exclusion was not applied correctly when the EECP was implemented. Performing an environmental assessment of all major route and procedure changes would place an unreasonable burden on FAA's already strained resources since the greatest majority of air route and procedure changes take place at higher altitudes, away from population centers, or both. The EECP has already provided the FAA with significant new input on the application of categorical exclusions and the extraordinary circumstances which could preclude their use. In accordance with the FAA environmental order, FAA will evaluate on a case-by-case basis the need for an environmental assessment for future major air route or flight procedure changes.

The following are GAO's comments on the Department of Transportation's letter of May 20, 1988.

GAO Comments

With regard to our first recommendation that FAA conduct an environmental assessment of the Expanded East Coast Plan, the Department does not concur and states that the basis for such an assessment—a comparison of the pre- and post-plan environments—cannot be developed at this time. The Department concludes this because data describing the pre-plan environment are not available. While this is true, we do not believe that it is sufficient reason for not preparing a comparative analysis. Instead, we believe that the pre-plan environment can be modeled, noise data can be estimated, and a reasonably accurate comparison can be made. Moreover, the Department states that it does plan to use data available from two New Jersey noise studies to assess the post-plan situation and determine if the noise levels are high enough to be a problem. This is a positive step, and by combining the results of these studies with estimated pre-plan data, analyzing the results to determine problem areas, considering whether feasible alternative means of routing air traffic over the problem areas exist, and sharing this analysis with the public, we believe that the Department will have developed the essential components of an environmental assessment of its plan.

The second recommendation in our draft report called for FAA to conduct an economic analysis of the plan's benefits for the purpose of determining whether they outweighed the plan's costs as might be defined in an environmental assessment. The Department did not concur with this recommendation because it believes that the plan has had a major positive effect on reducing delays. While we agree that delays have lessened, we do not know what portion is attributable to the plan and what portion is attributable to other factors, such as peak-period rescheduling and declines in traffic volume at the three New York area airports. However because we recognize that specific pre-plan economic and flight data, such as fuel usage and passenger time savings, needed to conduct an economic analysis are not available, we have revised our report to recommend that FAA conduct some minimum qualitative analysis to help distinguish that portion of delay reduction due to the plan from the portion due to other factors. Separating out the sources of delay could be based on qualitative judgments made by controllers, pilots, and airport officials. Until FAA collects and analyzes this kind of information, it will have little basis for judging the extent to which the delay reductions can be appropriately credited to the Expanded East Coast Plan.

Regarding our final recommendation on preparing environmental assessments for proposals for major air route or flight procedure changes, the Department states that procedures covering this area are already contained in an existing FAA order. The order discusses the need to prepare an environmental assessment in terms of whether FAA can anticipate environmental controversy or noise impact. While we believe this is an appropriate approach, we have reservations as to whether FAA has processes in place to make reasonable judgments about whether an airspace change will generate controversy and noise impact. Indeed, FAA states that it did not anticipate controversy in connection with the Expanded East Coast Plan, even though it knew in advance about the plan's many low level route changes over populated areas and substantial additional jet traffic. We believe that, as part of the process of implementing our recommendation, FAA will have to take certain steps that will help it to better anticipate possible controversy concerning major air route changes. These steps would include informing the public in unambiguous terms about the major airspace changes. Producing maps that show the proposed changes and that the public can understand would also help in this process. In this manner, potential controversy can be discovered in time to be addressed and factored into FAA's evaluation of any proposed airspace changes.

The numbered paragraphs below correspond to the marginal annotations we have made on the enclosure to the Department's letter.

1. In these two paragraphs, the Department establishes its position disagreeing with our recommendation that an economic analysis of the Expanded East Coast Plan be performed. It reaches this position by (1) discounting the effect that voluntary peak-period rescheduling by airlines at the New York area airports might have had on delays because that rescheduling was not implemented uniformly, (2) acknowledging that traffic was down by 5.6 percent at the three airports but asserting that because delays were down by so much more—34.2 percent—the plan, rather than the traffic reduction, must be responsible, and (3) noting that the People Express hub was not eliminated but rather replaced by a Continental Airlines operation. The Department concludes that the delay reductions are almost entirely attributable to the plan and for that reason an economic analysis is not needed.

We agree that an economic analysis may not be feasible because the necessary pre-plan data do not exist. We have modified our recommendation to suggest that FAA perform some minimal qualitative analyses to help it determine the proportion of delays reduced due to the plan or

various other factors. We disagree, however, with each of the Department's reasons for not concurring in our original recommendation. We discuss this below because the disagreement applies to our revised recommendation as it did to the original.

First, the Department does not say why, in order to have a positive effect on reducing delays, the airlines' attempts to reschedule should have been accomplished in a uniform manner at all three airports or by all the airlines involved. On the contrary, the purpose of this peak-period rescheduling was to lessen overall airport congestion. Thus, even if the benefits accrued unevenly across the three airports or the rescheduling was not accomplished consistently among airlines, the cumulative benefit still would tend to reduce total delays. And this would be true whether or not the plan had been implemented. Second, the Department does not provide information relating traffic levels to delay levels, and without some analysis of this relationship, we do not believe that the Department should so easily dismiss the effect that changes in traffic volume can have on departure delays. Third, because Continental's operation is of a different type and of lower volume than was that of People Express, this could account for some of the 14 percent decline in traffic at Newark from 1986 to 1987. Since the Department did not address the effect that operational and volume differences between Continental and People Express might have on delays at Newark International, we believe that it is still possible for this change in carriers to have had more than a trivial or inconsequential effect on reducing delays.

Thus, the Department's position that the plan has had a positive effect relies solely on measuring overall flight departure delays for the scheduled airlines at the three airports. Based on our knowledge of some aspects of the plan—for example, dual approach routes into Newark—we believe that the plan has had some positive impact on delays; however, the magnitude of that impact is not clear from the information provided by FAA or the Department. Moreover, in its comments on our draft report, the Department does not acknowledge that other information—such as which changes to the air route structure were most effective and why, the effect of changes in traffic levels on departure delays, the results of peak-period schedule analysis, or the effects of the plan on general aviation—could be used to assess the plan's merits. In addition, FAA should have convincing specifics on the benefits of the plan to compare to the specifics on the plan's environmental effects being derived in studies by the Port Authority and the state of New Jersey. This will be

valuable in establishing a reference point when these studies are completed and recommendations are made. It would also enhance the overall understanding of the Expanded East Coast Plan.

2. The Department's disagreement with our conclusion that FAA could have anticipated the plan's effects has been noted in the text of our report. We also note that, before we provided our draft report for comment, FAA's then-Director of the Office of Environment and Energy agreed with us that the controversy could have been anticipated. Moreover, because of the plan's magnitude and the many low altitude (3,000-5,000 feet) air route changes made where aircraft had not previously flown with any frequency, we continue to believe that FAA could reasonably have anticipated that the changes to routes and traffic patterns would be controversial on environmental grounds.

3. The Department states that, because noise data were not collected before the plan went into effect, no comparison with the current environment can be made and, therefore, an environmental assessment is not possible. We agree that a comparative analysis of pre- and post-plan situations would be an integral part of an assessment. However, we believe that pre-plan data for any New Jersey locale currently affected by the plan can be estimated with reasonable accuracy by measuring noise in that locale on a day when the planes, because of weather patterns, are not overflying the area or by taking measurements in a geographically similar locale that does not experience frequent overflights, which was the case for the affected areas before the plan was implemented.

Further, the Department of Transportation's criteria for preparing an environmental assessment demonstrate the need for FAA to prepare an environmental assessment. The Department's order 5050.4A, Airport Environmental Handbook, paragraph 24, b., states in part, that a federal action which is normally categorically excluded shall be subject to an environmental assessment should it likely be "highly controversial on environmental grounds." Federal action is considered to be highly controversial when it "is opposed on environmental grounds by a Federal, state, or local government agency or by a substantial number of the persons affected by such action." While the criteria apply to proposed actions, we believe they can be utilized by FAA to reassess its decision not to do an environmental assessment. FAA's Expanded East Coast Plan has been opposed by both state and local government entities and, according to a New Jersey Department of Environmental Protection official, over 4,000 letters have been sent to that department by New Jersey residents complaining about aircraft noise that they attribute to the

plan. In addition, with the results from studies by the Port Authority and New Jersey, FAA will have much of the information necessary to prepare the assessment. Moreover, we find support for this position in comments on our draft report from the Deputy General Counsel of the Council on Environmental Quality. The Deputy General Counsel does not disagree with our conclusion that an environmental assessment could be prepared now. Further, she states that our report should indicate that, if the assessment finds that the plan is having significant impacts, FAA should then prepare an environmental impact statement.

4. We are encouraged by FAA's support of the Port Authority study and its willingness to continue to work with the affected communities to ensure the success of that effort. We also note that in this paragraph the Department states that as data become available from the New Jersey and the Port Authority noise studies, FAA will assess the post-plan situation. By doing this and combining the results with an estimated or modeled pre-plan situation, we believe that, as noted above, FAA will be able to generate an environmental assessment that it can provide to the public and use as the basis for any future changes to the plan.

5. The Department states that FAA will adhere to our last recommendation by evaluating on a case-by-case basis the need for an environmental assessment for future major air route or flight procedure changes. However, FAA's order that describes the agency's process for determining the need for an environmental assessment provides FAA with a great deal of discretion in making this determination. Exercising this discretion will present a challenge for FAA because of the agency's need to carefully balance its goals of promoting commerce and ensuring safety with the added National Environmental Policy Act requirement to safeguard the environment. In addition, the Department states that there was no reason to expect the controversy that would have alerted FAA to the need to environmentally assess the Expanded East Coast Plan. In this regard we believe that FAA's environmental review process would benefit if it took steps to help it anticipate controversy. For example, FAA did not adequately convey information to the public about its plans for airspace changes as part of the Expanded East Coast Plan. Until we developed the maps that appear in our report showing how the new and revised routes overfly New Jersey, New Jersey residents could not reasonably foresee the noise impact of the plan. At FAA's request, we provided copies of our maps to officials of FAA's Eastern Region. Thus, although FAA has agreed with the thrust of our recommendation, we believe that FAA's implementation of the recommendation will not be effective unless the

agency clearly communicates the details of its proposals for major airspace changes to the public. With improvements in this area, potential controversy can be discovered in time to be considered in the design of the proposed changes.

Comments From the Council on Environmental Quality

Note: GAO comments supplementing those in the report text appear at the end of this appendix.

EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL ON ENVIRONMENTAL QUALITY
722 JACKSON PLACE, NW.
WASHINGTON, DC 20503

April 25, 1988

Mr. Kenneth M. Mead
Senior Associate Director
Resources, Community, and
Economic Development Division
General Accounting Office
Washington, D.C. 20548

Dear Mr. Mead:

Your letter dated April 7, 1988, and the draft report entitled Aircraft Noise: Implementation of FAA's Expanded East Coast Plan was referred to me by Chairman Hill for response. In general, I found the report to be well-written and accurate, although I do have some specific comments.

First, as the report states, the Council on Environmental Quality (CEQ) did approve the regulations promulgated by the Federal Aviation Administration (FAA) to implement the National Environmental Policy Act (NEPA), including the regulations providing for a categorical exclusion for changes in airspace routes above 3,000 feet. See Report at 3, 8, 43. One of CEQ's functions under NEPA is to review the NEPA-implementing regulations of all federal agencies for conformity to the statute and the CEQ regulations. See 40 C.F.R. § 1507.3(a).

Now pages 2,5,32.

You should note, however, that CEQ's approval of categorical exclusion regulations does not represent a finding by this agency that the activity excluded can, in fact, be conducted without significant impacts on the quality of the human environment. Rather, the Council attempts to ensure that the agency has adequately assessed the anticipated effects of its actions and that it has followed the necessary procedures in excluding particular actions. For example, the agency must provide notice of its categorical exclusion regulations and an opportunity for public comment. See 40 C.F.R. § § 1507.3(a) and 1508.4

See comment 1.

Thus, it is incorrect to conclude that CEQ has approved FAA's "policy" to exclude changes in airspace route carried out above 3,000 feet. See Report at 3, 8.

Now pages 2,5.

Second, the report states that, although the FAA believes its use of the 3,000 feet categorical exclusion to have been appropriate, an environmental assessment could now be prepared to examine the actual impacts of the Expanded East Coast Plan. See Report at 13. The report should also indicate that if the EA does find that the plan is having significant impacts, the FAA should then

See comment 1.

Now page 8.

prepare an environmental impact statement in accordance with 40 C.F.R. Part 1502.

Finally, the report discusses Chairman Hill's letter to Senator Lautenberg in December, 1987, relating to the application of the FAA's 3000 feet categorical exclusion to the Expanded East Coast Plan. While the report correctly quotes that letter, I believe additional information should be included to put that language in context.

See comment 1.

Specifically, Chairman Hill noted in his letter to the Senator that he understood that the Expanded East Coast Plan involved only flight paths at 3,000 feet or above and thus was "eligible" for a categorical exclusion. He also stated that this did not "absolve the FAA of the responsibility to prepare an EA or an EIS if environmental impacts did exist or if there were other extraordinary circumstances." Letter to The Honorable Frank R. Lautenberg, dated December 23, 1987, at 2. Moreover, while he concluded that there was no indication that the 3,000 feet categorical exclusion or its application in this instance was inappropriate, he asked Senator Lautenberg to provide additional information if this understanding was incorrect. Id.

I appreciate the opportunity to review your draft report and hope that you will be able to incorporate these comments into the final version. Should you have additional questions, please feel free to contact me at 395-5754.

Sincerely,

Lucinda Low Swartz
Deputy General Counsel

The following are GAO's comments on the Council's letter of April 25, 1988.

GAO Comments

1. We have made changes to our report to reflect the Council's three comments. Specifically, our report was revised to (1) recognize the Council's concern that its approval of FAA's categorical exclusion regulations not be construed in our report as a finding by the Council that the human environment will experience no significant impact due to the excluded activity, (2) clearly state that if an environmental assessment prepared by FAA finds that the Expanded East Coast Plan is having significant impacts, then FAA should then prepare an environmental impact statement, and (3) provide a more complete quote from the Council Chairman's letter to Senator Lautenberg.

Comments From the Port Authority of New York and New Jersey

Note: GAO comments supplementing those in the report text appear at the end of this appendix.

THE PORT AUTHORITY OF NY & NJ

April 29, 1988

Mr. Kenneth M. Mead
Senior Associate Director
U.S. General Accounting Office
Resources, Community and Economic
Development Division
Washington, D.C. 20548

Dear Mr. Mead:

In reference to your letter dated April 7, 1988, we have revieved the draft report entitled Aircraft Noise: Implementation of FAA's Expanded East Coast Plan (GAO/RECD-88-143). In commenting we will address two areas of concern expressed in the report regarding Harris Miller Miller Hanson's technical approach. These two concerns are how the citizen complaint data will be used and how the noise monitoring locations around the airport will be selected.

See comment 1.

The first concern pertains to whether the contractor will make sufficient use of citizen complaint data compiled by the Port Authority, the Federal Aviation Administration and the New Jersey Department of Environmental Protection. The consultant will review the complaint data and plot each source of the complaints on a map. This will be done in order to give a general indication of affected areas and, for the second phase of the study, will be used to help identify appropriate areas for en route aircraft noise measurements.

See comment 1.

The second concern relates to how the consultant will choose the locations around the airport at which to monitor noise for the purpose of verifying the airport noise contour. In this phase of the study, the consultant will identify several general locations based on their review of the airport's noise contours. The consultant will then visit these locations and further evaluate them based on aircraft overflights and presence of background noise and interference. As stated in the proposal, some of the selected locations will be approximately on the extended centerlines of the runways. Since this phase of the measurement program is to validate the airport noise contour data, the use of complaint data to select locations would not be appropriate.

See comment 1.

In addition to commenting on the draft report, we would like to advise you that we intend to expand our noise survey to include a representative number of full-octave band noise recordings. These recordings will then be converted by the FAA's Transportation Systems Center in Cambridge into noise metrics giving greater weight to the low-frequency component of aircraft noise events. Our decision to expand

THE PORT AUTHORITY OF NY & NJ

Mr. Kenneth M. Mead -2- April 29, 1988

the scope was based upon consulting with a number of acoustic and psychoacoustic practitioners who indicated that these low-frequency weighted measurements may help explain the reaction to the Expanded East Coast Plan from areas far removed from the airport where the ambient noise levels contain little low-frequency content. I would ask that you factor this information into your report.

I hope our comments have cleared up any areas of concern. Should you have additional questions regarding the consultant's technical approach please feel free to call me at (212) 466-7474.

Sincerely,

James P. Muldoon
General Manager
Aviation Technical Services

cc: Ed Griffith

The following are GAO's comments on the Port Authority's letter of April 29, 1988.

GAO Comments

1. In our draft report we noted three concerns that we had with the contractor's technical approach to performing the noise study at the Newark Airport. The concerns involved how citizen complaint data would be used, where noise measurement sites would be located, and whether measures in addition to Ldn might be considered in the contractor's study. Although the Port Authority addressed our concerns by describing what the contractor says it will do regarding them, we will continue to be concerned about these aspects of the study until it is complete. Therefore, we have not made changes to our report except to summarize the Port Authority's comments where appropriate.

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