



Federal Aviation Administration

Memorandum

Date: April 3, 2009

To: Denver Airports District Office, DEN-ADO
Helena Airports District Office, HLN-ADO
Seattle Airports District Office, SEA-ADO

From: Manager, Planning, Environmental and Financial Programs Branch, ANM-610

Reply To: Larson, (425) 227-2615
Attn Of: *Carolyn Tread*

Subject: **ACTION**: Regional Policy and Guidance: Planning Guidance, no. 09-01
Runway Extension Justification Considerations

Purpose

The purpose of this memo is to (1) identify the existing sources of FAA guidance on runway length determinations, (2) clarify criteria required to justify runway extensions, and (3) provide some rules-of-thumb for runway extension planning.

Reference Documents

There are many factors, and guidance from various sources, which can be considered in determining whether a runway extension is justified or not. This guidance promotes consistency in this Region in the selection and application of such factors. Relevant national guidance/policy includes:

- Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)*
- Order 5100.38C, *Airport Improvement Program Handbook*
- AC 150/5325-4B, *Runway Length Requirements for Airport Design*
- *Planning Information Needed for FAA Headquarters Review of Benefit Cost Analysis (BCA)*, 3/31/06

The attachment to this memo includes clarification on the use of the above guidance sources, as well as excerpts from those documents, with the most pertinent sections highlighted.

Rationale

This guidance is to supplement the cited references, while still allowing latitude and flexibility in decision-making. It does not provide a fixed-solution or rigid approach for all circumstances, as that would limit discretion. The decision process should exhibit a sound line of reasoning. For example: runway length requirements, like other airport facilities, typically are not designed to accommodate absolute peak demands. In some cases, though, for relatively rare constraints on airport users, it may be necessary to weigh the estimated costs (e.g., lost airline revenue due to reduced payload) of no-action versus the cost of a runway extension project (a simplified, informal BCA-type evaluation). If the benefit of the improvement exceeds its costs over a defined period of time, then the project may be justified. It should be noted that determining and justifying a runway length requirement is both a planning process and a design standards exercise. The planning portion typically includes the rationale, timing, alternatives, stakeholder involvement, environmental impacts and investment considerations, whereas the airport design standards provide the technical requirements.

Planning Guidelines - Simplified

Steps to determine whether a runway extension is justified or not:

1. Validate AIP eligibility.
2. Evaluate documentation submitted by the airport sponsor and/or consultant in light of applicable FAA planning and design criteria. Use the sources excerpted in this memo's attachments. If necessary, refer to the original guidance (especially AC 150/5325-4B).
3. Review forecasts (including comparison with the Terminal Area Forecasts—TAF, i.e., consistency within 10 percent at 5 years and/or 15 percent at 10 years). Validate existing and projected demand by aircraft(s) requiring specific runway length(s).
4. For planning purposes, use the following rules-of-thumb (a similar concept to that of analyzing forecast demand as a percentage of annual service volume—ASV):
 - a. Plan for indicated improvements, i.e., update the master plan and ALP, when demand by the critical aircraft(s)—other than air-carrier—needing a longer runway reaches **250** annual operations (note: scheduled air-carrier operations at any level of demand may require near-term action).
 - b. Initiate the environmental process, if applicable.
 - c. Implement improvements by the time critical-aircraft annual operations reach **500**.
 - d. Expressed in projected timeframes:
 - i. 10 years out, plan.
 - ii. 5 years out, environmental.
 - iii. 0 years out, construct.
5. Document the decision process and findings for the files.

Applicability

Each ADO should use this guidance to help determine the adequacy of runway lengths and, in particular, to substantiate justification for any proposed runway extension. Each ADO will take action to ensure that, prior to construction, every proposed runway extension meets all applicable

FAA criteria for AIP eligibility, documented justification, planning, design standards and environmental approval.

ATTACHMENT

Planning Guidelines – Additional Clarification on the Use of AC 150/5325-4B

(Source: APP-400)

This section clarifies issues that have been raised on the use of Advisory Circular 150/5325-4B, *Runway Length Requirements for Airport Design*, in airport planning and development.

AC 150/5325-4B provides guidance on recommended runway lengths for new runways and extensions to existing runways. The AC has a dual role. It was written for airport operators not needing Federal aid that decide the number of qualifying operations (i.e. regular use) for runway development at their airport. It was also written for the Federally-assisted program. In this AC, regular use implies less than 500 annual itinerant operations by the critical design aircraft. However, the AC (paragraph 103, for primary runways, and paragraph 104, for crosswind runways) limits the Federal project (i.e. the AIP-eligible portion) to the length needed for aircraft that make substantial use of the runway. “Substantial use” is defined in the AC as 500 or more annual itinerant operations by the critical design aircraft (see paragraph 102.a.(8)). “Regular use” (less than 500 annual itinerant operations) could be a sponsor justification supporting a Purpose and Need statement for a NEPA document. However, AIP and PFC funding participation are limited to the project portion justified by at least 500 annual itinerant aircraft operations by the critical design aircraft. Scheduled commercial service meets the substantial use criteria for AIP and PFC eligibility, even if less than 500 annual itinerant operations is involved. The connection between scheduled commercial service and substantial use is made in paragraph 3-4 of FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)*.

Apply the following when using the guidance of AC 150/5325-4B:

- 1) Check the length of the primary runway before providing matching length in a parallel runway for noise and capacity purposes or a crosswind runway. For example, an airport may have inherited a 10,000-foot-long primary runway from the military, yet only needs 8,000 feet for the aircraft that use the airport on a regular or substantial basis or are forecast to use it that way. In this case, the parallel capacity/noise runway or crosswind runway should not exceed 8,000 feet long. See para. 506.a., FAA Order 5100.38C, for AIP eligibility for airfield facilities that exceed FAA airport design standards (such as the inherited 10,000-foot-long runway on a former military air base).
- 2) Paragraph 104 and Table 1-3 statements on recommended runway lengths for crosswind runways are clarified by revising the last sentence of paragraph 104 to read “Follow the guidelines of Table 1-3 and paragraph 102(b) for determining runway lengths for all crosswind runways.”

Reference Documents: Pertinent Excerpts

ORDER 5090.3C, FIELD FORMULATION OF THE NATIONAL PLAN OF INTEGRATED AIRPORT SYSTEMS (NPIAS)

3-4. AIRPORT DIMENSIONAL STANDARDS

Airport dimensional standards (such as runway length and width, separation standards, surface gradients, etc.) should be selected which are appropriate for the critical aircraft that will make substantial use of the airport in the planning period. Substantial use means either 500 or more annual itinerant operations, or scheduled commercial service.

(emphasis added) The critical aircraft may be a single aircraft or a composite of the most demanding characteristics of several aircraft. The critical aircraft (or composite aircraft) is used to identify the appropriate Airport Reference Code for airport design criteria. Design criteria (such as dimensional standards and appropriate pavement strength) are contained within AC 150/5300-13, Airport Design.

ORDER 5100.38C, AIRPORT IMPROVEMENT PROGRAM HANDBOOK

505. AIRFIELD PROJECT JUSTIFICATION.

a. Aviation User Requirements. The general eligibility of work is not the same as justification based on current airport user needs. Letters of support should be requested from airport users whenever a proposal is beyond that justified by a lease or other firm commitment to use the project. Airport users should be asked to describe their plans and the anticipated public use activity level by a specific aircraft, including the approach category as well as airplane design group. In some cases, there may be more than one critical aircraft. For instance, pavement strength and layout are frequently dependent upon different aircraft. Except as otherwise noted, the activity levels used for accepting NPIAS airport roles apply to project justification, and Order 5090.3 describes procedures for field formulation of the NPIAS.

b. Documented Aeronautical Need. The simple endorsement of a project by the airport sponsor or a forecast of activity is not adequate by itself to establish justification for the work. Forecasts should be realistic and supported by the information and documentation provided by the sponsor. Formal justification by aviation users may have been previously documented in an airport planning report. When reviewing a proposal, the region should evaluate the work required upon completion of the project and forecast to occur at some future time. The sponsor's forecasts should be compared to the existing Terminal Area Forecast (TAF) and any substantial differences should be resolved. The FAA's TAF is to be used in accordance with Paragraph 428a. Economies of scale may be obtained by allowing a project to be expanded for the five-year forecast if, in the judgment of the FAA, the airport is growing sufficiently to necessitate that. However, no project should be approved for funding without analysis of the specific requirements for development and documentation of aeronautical demand used to justify the work.

506. PROJECT STANDARDS AND DESIGN

a. Development Exceeding Design Standards. New facilities exceeding FAA design standards are not eligible except as noted in Paragraph 505b, although AIP work may be combined with an ineligible project provided the airport pays the extra costs. See Paragraph 613. In addition, a project for rehabilitation of existing airfield facilities (or repairing equipment) that exceed FAA design standards may be eligible for AIP participation if it meets the other applicable requirements and the following:

(1) The project is otherwise eligible;

(2) The cost in excess of that required to achieve facilities/equipment that meet FAA design standards is justifiable in the view of the region for preserving or enhancing the existing capability; and

(3) Operational experience has established a continuing need for the existing facility or equipment to accommodate occasional airport users requiring it.

AC 150/5325-4B, RUNWAY LENGTH REQUIREMENTS FOR AIRPORT DESIGN

102. DETERMINING RECOMMENDED RUNWAY LENGTHS.

a. Assumptions and Definitions.

(2) **Critical Design Airplanes.** The listing of airplanes (or a single airplane) that results in the longest recommended runway length. The listed airplanes will be evaluated either individually or as a single family grouping to obtain a recommended runway length.

(8) **Substantial Use Threshold.** Federally funded projects require that critical design airplanes have at least 500 or more annual itinerant operations at the airport (landings and takeoffs are considered as separate operations) for an individual airplane or a family grouping of airplanes. Under unusual circumstances, adjustments may be made to the 500 total annual itinerant operations threshold after considering the circumstances of a particular airport. Two examples are airports with demonstrated seasonal traffic variations, or airports situated in isolated or remote areas that have special needs.

b. Procedure and Rationale for Determining Recommended Runway Lengths.

(1) **Step #1.** Identify the list of critical design airplanes that will make regular use of the proposed runway for an established planning period of at least five years. For Federally funded projects, the definition of the term “*substantial use*” quantifies the term “regular use” (see paragraph 102a(8).)

Excerpted from “Planning Information Needed for FAA Headquarters Review of Benefit Cost Analysis (BCA)”, 3/31/06 (emphasis added)

- **Project justification, including** the following, as applicable:
 - Airline/user support letters or contracts for new air service (by aircraft type), based aircraft or change in facility use (i.e. new flight school). The support letter should specify the following and be signed by persons in a position to authorize such operations:

- **current constraints placed on a potential user (payload/stage length);**
- projected number of annual operations by specific aircraft if project is built;
- stage length of projected operations;
- date service is expected to start;
- airfield and landside facilities needed to meet the anticipated activity level, including runway length and approach minima.
- Special planning studies done for the project or development program;

Note: APP-400 authored the above BCA guidance and has concurred with the approach of using the “constraints” principle, even when a BCA is not being done.