

# **AIRPORT PROJECT FUNDING AND DEVELOPMENT**

## **Workshop Highlights**

Last year, the Airport Technical Assistance Program (AirTAP) held a four-part training program on airport project funding and development at locations throughout the state. These sessions were designed to complement the general aviation entitlement sessions that Mn/DOT Aeronautics offered. The purpose of the series was to assist local airport staff with reducing costs and improving the safety, quality, and overall efficiency of airport operations.

This “highlights” package summarizes much of the information shared during these training sessions. If you were unable to attend, we hope it will provide you with useful new information on project funding and development. For those who did attend the workshops, let these highlights serve as a reminder of and a reference for the information that was presented during the sessions.

AirTAP is a statewide assistance program for aviation personnel that offers practical instruction by knowledgeable and experienced trainers, as well as a range of information resources. AirTAP’s efforts include providing training programs, technical assistance, access to experts, and printed materials.

AirTAP was developed through the joint efforts of the Minnesota Department of Transportation (Mn/DOT), the Minnesota Council of Airports (MCOA), and the Center for Transportation Studies (CTS).

To receive more information about the program, or copies of the AirTAP materials mentioned in these highlights, please contact:

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## **Project Development: Taking Steps to Ensure Proper Project Development**

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The elements of an airport project are listed below. Several of these are covered in this summary; those elements not covered are available in separate documents from the AirTAP office.

Note that as part of airport project development, the airport must be in the State Aviation System Plan (SASP) and must be zoned or in the process of being zoned.

Steps in airport project development:

- Submittal of the improvement for inclusion in the Minnesota Department of Transportation's (Mn/DOT) Capital Improvement Program (CIP)
- Inclusion of the improvement on an Airport Layout Plan (ALP)
- Environmental assessment and consultation process\*
- Land acquisition\*
- Preliminary engineering
- Design
- Construction

\* May be required on larger projects.

### **State Aviation System Plan (SASP)**

The SASP is a comprehensive and systematic assessment of the long-term (20-year) aviation needs in Greater Minnesota. It makes recommendations for improvements to system airports to address the identified needs. The first SASP, completed in 1974, has been updated in 1981, 1991, and 1999 to address changing conditions. Copies of the SASP can be obtained from the Mn/DOT Office of Aeronautics.

### **Airport Zoning Standards**

An airport zoning ordinance, approved by Mn/DOT, is required before an airport can receive state or federal funding. Minnesota Statutes Section 360.061 and Minnesota Aeronautics Rules Ch. 8800 govern airport zoning standards. A procedural guide is also available from Mn/DOT Aeronautics, which includes a model airport zoning ordinance.

Airspace obstruction zoning defines the height restrictions for areas around an airport. The airspace protection is similar to the Federal Aviation Regulations (FAR) Part 77—Imaginary Surfaces except that the former is more restrictive in the approach and horizontal zones.

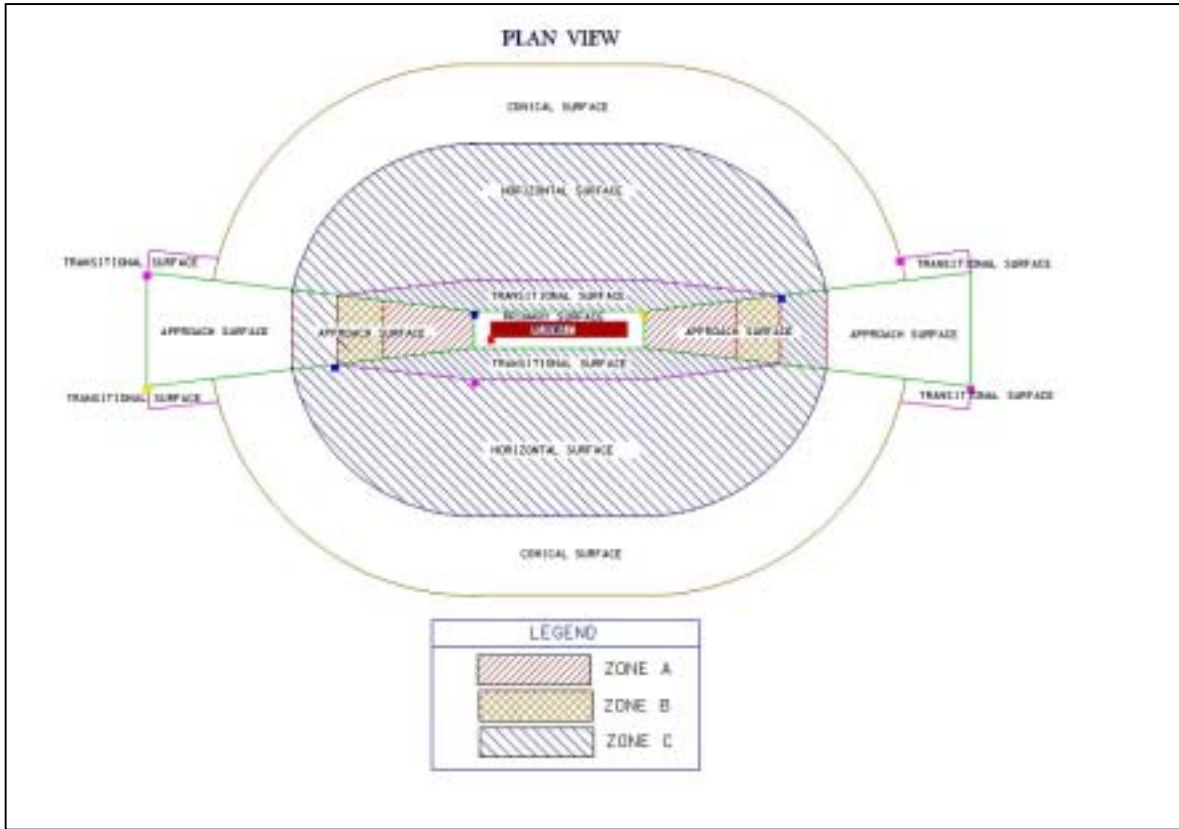
### ***Restrictions***

Approach Zone — 40:1 (state) verses 34:1 (federal)

Horizontal Surface — 6,000 feet (state) verses 5,000 feet (federal)

Land Use Safety Zones are established to restrict those uses that may be hazardous to the operational safety of aircraft using an airport. Building density and population limits in

the runway approach areas are critical to maintaining the safety of persons on the ground as well as in the air.



#### Safety Zone A

- Part of the approach surface extending a distance of two-thirds of the runway length from end of primary surface
- No buildings or exposed transmission lines allowed
- No assembly of persons allowed
- Permitted uses include:
  - Agriculture, livestock, cemeteries, auto parking
  - Non-spectator recreational activities

#### Safety Zone B

- Part of the approach surface extending a distance of one-third of the runway length from Zone A
- Three-acre minimum area per site
- Site population must be less than 15 times the site acreage
- One building plot per site, any number of structures
- Ratio of site area to building plot area dependent on site acreage
- Specifically prohibited:
  - Churches, hospitals, schools
  - Theaters, stadiums

- Hotel and motels
- Trailer courts
- Campgrounds
- Other places of public or semipublic assembly

#### Safety Zone C

- All land within the horizontal surface that is not included in Zone A or Zone B
- General restrictions:
  - Any object that creates or causes interference with radio or electronic facilities or communications
  - Objects that make it difficult for pilots to see airport lights or impair pilots visibility
  - Objects that endanger landing, taking off, or maneuvering

#### **Capital Improvement Program**

The Capital Improvement Program (CIP) for Mn/DOT Aeronautics is updated yearly. Mn/DOT distributes information in October, and airport owners wanting to complete a project must submit it for inclusion in Mn/DOT's CIP in order for the project to be eligible for funding. A preliminary cost estimate is required as part of the CIP.

Any of the following activities can be included in Mn/DOT's CIP:

- Maintenance
  - Crack sealing
  - Roof repair
  - Hangar door replacement
- Equipment
  - Snowplows
  - Aircraft rescue and firefighting (ARFF)
  - Mowers
  - Maintenance vehicles
- Reconstruction/Rehabilitation
  - Pavement overlays
  - Bituminous and concrete crack repair
  - Lighting/NAVAID replacement
  - Pavement reconstruction
- Airport expansion
  - Runway extension
  - Parallel taxiway construction
  - Apron expansion
  - Land acquisition
  - Planning studies
  - Building area expansion
  - Hangar construction
  - NAVAIDS

Help is available to determine the type of work that is required to rehabilitate or reconstruct airfield pavement. AirTAP offers an airfield pavement maintenance course each winter;

information on course locations and dates is available on the Center for Transportation's web site at [www.cts.umn.edu](http://www.cts.umn.edu).

Mn/DOT Aeronautics assesses the condition of airfield pavements and prepares an Airport Pavement Condition Report, calculating a pavement condition index for pavements every three years. Mn/DOT's goal is to have 90 percent of all runways at or above a Pavement Condition Index (PCI) of 60. If the pavement at an airport has a PCI below 60, it is a candidate for some kind of rehabilitation. A PCI between 40 and 55 requires crack repair and surface treatment. A PCI between 10 and 40 requires a pavement overlay, and a PCI below 10 may necessitate total reconstruction of the pavement. A separate summary document is available from Mn/DOT that outlines pavement maintenance and condition evaluation for each SASP airport.

### **Public Involvement**

Public involvement is a recommended element in project decision making. Involve the public early in the planning and environmental preparation process, providing several opportunities for review and comment on draft and final environmental documents in addition to holding public information meetings to allow comment on proposed projects.

### **Completion of the Airport Layout Plan or Master Plan**

Two separate documents summarizing the process for developing an ALP and a Master Plan are available from the AirTAP office.

### **Environmental Assessment and Consultation Process**

Environmental guidance is available in the following documents:

- National Environmental Policy Act (NEPA)
- CEQ Regulation 1500
- FAA Order 1050.1D
- FAA Order 5050.4B
- FAA NEPA Review Checklist
- *State Environmental Guidelines*, Chapter 4410

A summary outlining the process for preparing environmental documentation is available from the AirTAP office.

### **Land Acquisition**

The Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970 governs land acquisition. Its purpose is to establish a written policy for fair and equitable treatment of persons displaced as a result of a federal or state program. Items addressed are:

- Decent, safe, and sanitary housing
- Purchase supplement
- Rental assistance
- Fair housing
- Replacement housing payments
- Moving costs
- Relocation services

- Differential mortgage costs
- Appraisal fees

Additional information on land acquisition can be found in the FAA Advisory Circular 150/5100-17, *Land Acquisition and Relocation Assistance for AIP Assisted Projects*, and in *A Guide for Airport Land Acquisition (Eligibility for State and Federal Funding)*, which outlines the elements of Minnesota Statutes 117.00.

FAA AC 150/5100-17 covers the following elements for land acquisition for AIP-assisted projects:

- Appraisal requirements
- Requirement to offer appraised value
- Process for administrative settlement
- Eminent domain as a sponsor's last resort
- Quick Take, which allows the project to proceed

The acquisition timeline is determined by:

- Need determination during preliminary design
- Appraisals: three to six months (one year re-do)
- Direct purchase: one month to one year
- Quick Take: file/court plus ninety days
- Relocation: three months to two years
- Eminent domain (condemnation): up to seven years with appeals

### **Preliminary Engineering**

Preliminary engineering better defines the project and allows the sponsor to refine construction costs. Phasing of the project to meet funding limits can be done during this preliminary stage. A funding breakdown to determine local share, and a schedule for the project design and construction, should also be completed.

### **Final Design and Construction**

Final design and construction are summarized in a separate AirTAP product, available from the AirTAP office.

### ***Additional Resources***

- Minnesota Statutes Section 360.061
- Minnesota Aeronautics Rules Ch. 8800
- National Environmental Policy Act (NEPA)
- CEQ Regulation 1500, *Council on Environmental Quality (CEQ) Guidelines for Preparation of Environmental Impact Statements*
- FAA Order 1050.1D, *Policies and Procedures for Considering Environmental Impacts*
- FAA Order 5050.4B, *Airport Environmental Handbook*
- FAA NEPA Review Checklist
- *State Environmental Guidelines*, Chapter 4410, "Environmental Review"

- Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970
- AC 150/5100-17, *Land Acquisition and Relocation Assistance for AIP Assisted Projects*
- Minnesota Statutes 117.00, *A Guide for Airport Land Acquisition (Eligibility for State and Federal Funding)*



## **Revenue Generation: Income from Airport Operation**

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Developing income from the operation of an airport can be challenging. This summary focuses on the issues that should be considered when developing a plan for deriving income, establishing standards, and protecting land for airport-related businesses and services.

### **Rates and Charges**

Rates and charges vary by airport type. Commercial airports can generate revenue through landing fees, concession fees (such as car rentals, fixed base operator (FBO) operations, and vending services), office space rental, and building leases. Land with and without utilities also can generate revenue. Airlines provide revenue through tickets, holding rooms and gates, baggage claim space, and office space. Tie-downs also provide a source of revenue.

For non-commercial airports, other opportunities exist, such as T-hangar rentals, FBO hangar rentals for both land and buildings, corporate hangar fees, fuel fees, and agricultural leases.

Setting rates and charges can be difficult. Resources that may prove helpful include the Minnesota Council of Airports (MCOA) *Airport and FBO Survey* (completed in 2000) and the *Wisconsin Public Airports Study* (completed in 1999).

### **Minimum Standards**

FAA Advisory Circular 150/5190-1A, *Minimum Standards for Commercial Aeronautical Activities on Public Airports*, provides basic information and broad guidance material to assist the owners of public airports in developing and applying minimum standards for commercial activities at public airports. It outlines the minimum standards in general, explains how they are developed, and illustrates how, through proper application, they can work to the advantage of the airport owner, the operator of a commercial aeronautical activity, and the general public.

Minimum standards are defined as the minimum requirements to be met as a condition for the right to conduct aeronautical activity at the airport. Aeronautical activity can be charter activities, pilot training, or aircraft rental. Examples of both aeronautical and non-aeronautical activity are listed below.

#### Aeronautical activity

- Charter operations
- Pilot training
- Hangar rental
- Aircraft rental
- Aerial photography
- Crop dusting
- Aerial advertising and surveying
- Air carrier operations
- Aircraft sales, parts, and service
- Sale of aviation petroleum products

- Repair and maintenance of aircraft
- Other activities directly related to the operation of aircraft

Non-aeronautical activity (landside)

- Taxis
- Car rentals
- Limousines
- Restaurants
- Barber shops
- Auto parking lots

Minimum standards safeguard the public interest and protect airport patrons from irresponsible, unsafe, or inadequate service. They also preserve the stability of established airport businesses. Minimum standards must be reasonable and relevant and depend on the type of airport and activity.

**Elements of a Standard**

Many communities rely on a financial commitment as a requirement for leasing and developing minimum acreage or building space, or as an outright minimum dollar investment. Some of the elements that should be incorporated into standards at most airports would require the service provider to:

- Arrange suitable spaces, structures, or facilities
- Provide adequate fixtures and equipment
- Maintain adequate staff with required skills, licenses, and certificates
- Operate during specified minimum hours
- Conform to safety, health, and sanitary codes
- Provide evidence of financial stability
- Meet indemnity and insurance minimums

Items to include in a minimum standard document:

- Minimum standard for FBOs
- Application and qualifications
- Action on application
- Aircraft sales
- Aircraft repair
- Aircraft lease and rental
- Flight training
- Aircraft fuel and oil
- Charter and air taxi
- Aircraft storage
- Aerial applicators
- Commercial skydiving
- Air ambulance
- Flying clubs
- Ultralights

- Operators subleasing from another
- Specialized commercial flying services
- Use of hangars

### **Land Use Identification Plans**

Land Use Identification Plans are closely related to minimum standards, offering a convenient and effective tool for outlining the airport owner's program for developing the land. The plan should identify areas dedicated to the following:

- Aeronautical services
- Fuel storage
- General aviation
- Passenger loading
- Air freight
- Aircraft parking
- Public auto parking
- Parcels held for future expansion

### **Leases**

Airport owners must control the use of their airport property and facilities. Lease agreements between the owner and potential users of airport property and facilities provide a vehicle to control use and document rates and charges.

A partial list of the types of leases typical of airports would include:

- Fixed base operator
- Airport use agreement with airlines
- Concession agreement
- Airport facilities
- Hangar/tie-down rates
- Agriculture
- Off-Airport – NAVAIDs
- Weather Bureau
- FAA control tower
- FAA field office
- Vending services
- Taxicab or limo services
- Timber sales from airport property

Sample leases are available from the following sources:

- Mn/DOT Regional Engineers
- Wis/DOT Bureau of Aeronautics at [www.dot.state.wi.us/dtid/boa/](http://www.dot.state.wi.us/dtid/boa/)
- *How to Assure the Future of Your Airport* (Ekrose/Green, 1993)
- *Small Airport Management Handbook* (Jerry A. Singer, 1985)

### ***Additional Resources***

- MCOA Airport and FBO Survey (completed in 2000)
- Wisconsin Public Airports Study (completed in 1999)
- FAA AC 150/5190-1A, *Minimum Standards for Commercial Aeronautical Activities on Public Airports*
- Mn/DOT Regional Engineers
- Wis/DOT Bureau of Aeronautics at [www.dot.state.wi.us/dtid/boa](http://www.dot.state.wi.us/dtid/boa)
- *How to Assure the Future of Your Airport* (Ekrose/Green, 1993)
- *Small Airport Management Handbook* (Jerry A. Singer, 1985)

## **Developing Local Support: Getting the Community Involved and Committed to an Airport**

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Key officials, the public, the local press, and other community groups must be educated about the value of an airport and what it provides to the community. Getting the word out about the activities and benefits of the airport is key.

### **Airport Support Group**

One way to begin developing local support is to organize an airport support group made up of airport users and community members (including non-pilots) who support the airport.

Activities of this group could focus on:

- Developing political and local support for the airport
- Addressing safety concerns
- Construction activities
- Promotion of the airport
- Special events planning and organization
- Educational opportunities associated with the airport
- Emergency planning
- Airport beautification
- Delivering speeches and presentations to community groups, such as Kiwanis, Optimists, Lions, or schools

One of the goals of such a group should be to simply get the word out to the community about the value of the airport and why it is important as a regional resource. To accomplish this, the group might regularly publish a newsletter for distribution throughout the community. The group should find a leader in the community to champion the airport and promote its value. The involvement of non-pilot community leaders will help validate the group's work. Another avenue is to address Rotary Clubs, Kiwanis, Lions groups, and local schools about the value of the airport.

In general, the group should present a unified voice of support in the community and increase visibility of the airport and its activities. The group may want to develop a simple name and logo that becomes identifiable to others in the community.

### **Public Relations and Marketing**

A public relations plan is important for promoting the airport. Its basic purpose is to educate the community about the value of the airport—whether that derives from the number of jobs brought to the community, the businesses that have located in the area, or the revenue that is generated for the community because of the airport's existence. Social impacts are also important, and thus should be noted as well. A lack of understanding of these elements is behind most airport-related problems. The goals of the airport and the community must be complementary—and they usually are. Promoting similar goals will help bridge the gap between airport users and non-users.

Activities for good public relations include:

- Collecting and compiling accurate, factual information for distribution
- Communicating with press releases and personal letters to the editor
- Identifying and getting to know and assist key media and community leaders
- Holding special events at the airport
- Making the airport available for community meetings and activities
- Using the airport as an educational tool for local schools

The airport support group also has many marketing tools at its disposal. Examples of good marketing tools include:

- Personal phone calls and letters
- Posters
- Brochures
- Paid advertising
- Speeches to civic groups
- News releases
- Media interviews
- Radio talk shows or call-ins
- Store window displays
- Public hearing testimony
- Letters to the editor
- Articles in local company or neighborhood newsletters
- Bumper stickers

General aviation (GA) aircraft provide community services through:

- Agricultural crop spraying
- Fire-fighting
- Search and rescue
- Medical transportation (including that for transplant organs)
- Law enforcement
- Business
- Education
- Flight training
- News

### **Aircraft Owners and Pilots Association**

The Aircraft Owners and Pilots Association (AOPA) provides guides and support services for local airports. Its web site is found at [www.aopa.org](http://www.aopa.org), or the group may be reached by phone at 1-800-USA-AOPA. One service AOPA offers is the Airport Support Network, whose primary goal is to have one member at every public use airport in the United States. In doing so, the AOPA believes that an airport's general aviation community will be able to solve problems before they escalate.

The AOPA notes that each year, GA aircraft fly 44.7 million hours, cover more than 3 billion miles, carry more than 89 million passengers, and add more than \$42 billion to the nation's economy.

Local airports are closing due to rising real estate values, pressures to develop airport property into residential and commercial uses, encroaching residential development, and a public uninformed about the benefits that airports bring to local economies. Using the tools listed above, you may be able to gain more local support for your airport.

***Additional Resources***

The following AOPA guides are available on the organization's web site:

- *Airports—A Valuable Community Resource—The Guide to Obtaining Community Support for your Local Airport*
- *The Complete Guide to Holding an Airport Open House*
- *AOPA Airport Support Network—Local Airports—Access to America* (video)





## **Assessing the Economic Impacts of Your Airport: Demonstrating an Airport's Value to the Community**

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Economic impacts are measured by the economic activity, earnings, and jobs generated by the airport activity, or by the fact that the airport exists. Economic impacts generated by a local airport can be either direct or indirect. In addition, an airport may generate multiplier impacts, which include money spent at or for the airport that flows through the regional economy.

The following may generate direct impacts:

- Airlines
- Air cargo carriers
- Air taxis or charter
- Aircraft services
- Airport management and operations
- Car rental agencies
- Corporate flight operations
- Freight forwarders
- Fixed base operators
- Government projects based at airports
- Airport tenants

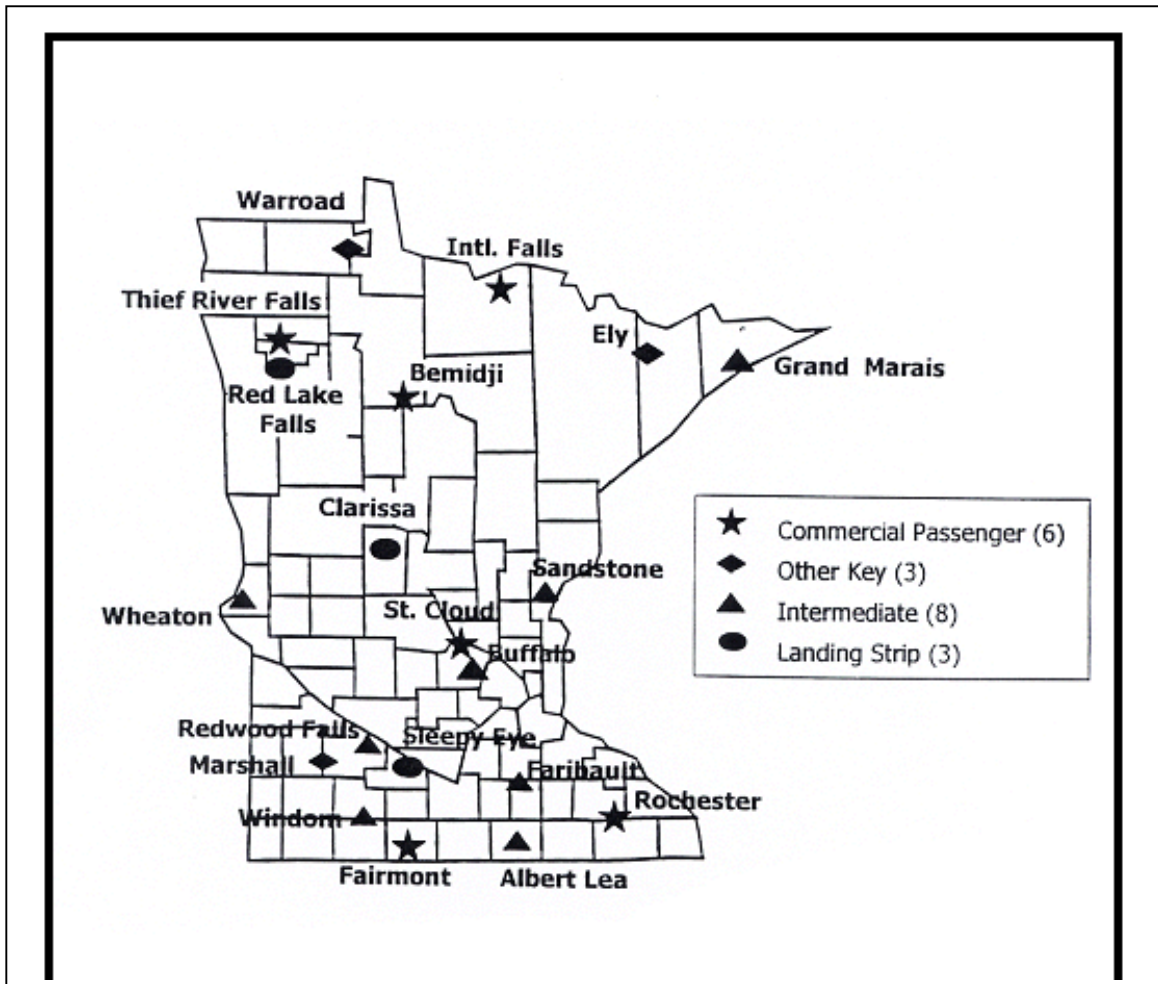
Indirect impacts may be generated from expenditures by airport users or from regional expenditures at local businesses as a result of airport use or travel.

Indirect impacts include:

- Food and beverage
- Lodging
- Entertainment
- Retail sales
- Travel agencies
- Ground transportation

To calculate the economic impact of aviation, direct and indirect impacts must be measured, and the multiplier effect assessed.

The *Minnesota Airports Economic Impact Study*, completed by Wilbur Smith and Associates in January 1999, examined 20 Minnesota airports in four different categories: commercial service, key airport, intermediate, and landing strip.



The study found that economic activity for commercial service airports ranged from \$13 million to \$168 million, with an average of \$61 million. Earnings generated from the airports ranged from \$409,000 to \$54 million, with an average of \$13.1 million. For the airports studied, 20 to 3,061 jobs were generated, with an average of 760.

At airports with a runway longer than 5,000 feet but with no commercial service, the findings were as follows:

#### Economic Activity

- \$1.8 million to \$5.5 million
- Average: \$3.4 million

Earnings

- \$556,000 to \$1.6 million
- Average: \$1.1 million

Jobs

- 25 to 74
- Average: 54

At airports identified as being part of the intermediate system (paved runway less than 5,000 feet) the findings were as follows:

Economic Activity

- \$224,200 to \$6.9 million
- Average: \$1.7 million

Earnings

- \$65,000 to \$2.1 million
- Average: \$508,000

Jobs

- 3 to 92
- Average: 23

At airports that were part of the landing strip system, the findings were as follows:

Economic Activity

- \$65,300 to \$393,000
- Average: \$217,000

Earnings

- \$64,300 to \$123,000
- Average: \$70,000

Jobs

- 1 to 6
- Average: 4

Airports Impact Summary: 1997 Data

<b>Impact Source</b>	<b>Economic Activity</b>	<b>Earnings</b>	<b>Jobs</b>
Visited Airports	\$298,562,900	\$94,997,700	5,280
Metro Council (7 Relievers)	277,084,300	101,998,300	3,745
MAC (MSP)	9,489,400,000	2,781,700,000	99,461
Non-visited MN Airports	307,881,600	97,502,900	5,289
<b>Total Minnesota</b>	<b>\$10,372,928,800</b>	<b>\$3,076,198,900</b>	<b>113,775</b>

Source: *Minnesota Airports Economic Impact Study*, Wilbur Smith and Assoc. (January 1999)

***Additional Resources***

Other economic impact studies that can be used to assess the economic impacts of your local airport include:

- *Greater Minnesota Airports*, State Aviation System Plan
- *Metro Reliever Airports*, Metropolitan Council
- *Minneapolis-St. Paul International Airport*, Metropolitan Airports Commission

## **Hiring a Consultant: An Initial Step to Airport Project Development**

A critical first step in developing an airport project is hiring a consultant. A good consultant will lead the effort, assisting with the required processes for obtaining funding, identifying important project elements, developing complete plans and specifications, and finally, securing a bid from a competent contractor. A consultant can also assist with planning, engineering, and architectural services.

### **The selection process**

Qualifications-based selection is required for Airport Improvement Program (AIP) projects (see additional resources at the end of this section for more information). Price or cost may not be used as a consideration until the negotiation step.

The selection process can benefit from incorporating the following steps:

1. Identifying a general scope of services.
2. Establishing a selection board. This board can consist of airport board members, community leaders, public agency employees, pilots, or others interested in and involved with the airport. Sometimes it is a good idea to have someone on the board who is against the project.
3. Requesting a Statement of Qualifications (SOQ). The SOQ includes project identification, firm background, relevant project experience, team members' experience, client references, and evidence of Equal Opportunity Employment/Affirmative Action.
4. Choosing one of two approaches for continuing the selection process. One is to select a consultant directly from the SOQs and begin the negotiation process. If this approach is used, the selection board still needs to use agreed upon objective criteria to evaluate and rate the SOQs. The FAA recommended and preferred process is to select three to five of the best-qualified candidates based on their SOQs and conduct interviews to gather a more detailed view of their project approach.
5. Developing the scope of work and services required of the selected consultants, as well as selection criteria and relative importance. Some examples of selection criteria include:
  - Capability to perform aspects of the project
  - Recent experience with comparable projects
  - Reputation—integrity and competence
  - Evidence of affirmative action
  - Qualifications of key personnel and availability
  - Current workload
  - Demonstrated ability to meet schedules
  - Capability to complete projects without major overruns
  - Qualifications of outside consultants
  - Quality of previous projects
  - Knowledge of FAA regulations, policies, and procedures

- Understanding of the project’s potential problems and the sponsor’s special concerns
- Capability to furnish qualified inspectors

### **Interviewing\***

Once the consultant field has been narrowed, you’re ready to conduct interviews. To prepare for a successful interview process, first develop objective rating criteria and then prepare a list of questions to ask during all interviews. You should plan to allow 20 to 30 minutes for presentations, followed by a question-and-answer period. In addition, allow ample time between presenters and make sure to provide adequate facilities for the interviews.

### **Negotiations and contracts**

Once you’ve finished interviews, rank the consultants based on the predetermined selection criteria and initiate discussions with your first choice in order to fully and clearly define scope of work and services. Next, negotiate an agreeable fee for services. (Note that the FAA requires that a record be kept of the negotiations.) For contracts greater than or equal to \$100,000, you will need to prepare an independent cost estimate.

You should also outline the project schedule and perform an independent analysis and comparison (in accordance with federal requirements). Then you are ready to develop a consultant contract. The Minnesota Department of Transportation has created a sample contract that is available through the AirTAP program upon request.

### ***Additional Resources***

The federal requirement for qualifications-based selection for AIP projects is described in Section 18.36 of 49 CFR, Section 47107 (a)(17) of 49 USC, and Title 9 of the Federal Property Administrative Services Act of 1949 (also known as the “Brooks Act”).

Consultant selection requirements and information on the contracting process can be found in the FAA Advisory Circular *Architectural, Engineering, and Planning Consultant Services for Airport Grant Projects* (no. 150/5100-14C).

\* This step is optional.

## Developing a Master Plan: Documentation to Justify Development at an Airport

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A master plan is a document that explains and justifies the long-term development of an airport with the goal of providing guidelines for future airport development.

Components of a master plan include:

- Inventory of current facilities and existing conditions of an airport
- Forecast of aviation demand
- Facility requirements
- Concepts (development alternatives)
- Environmental overview
- Detailed preferred alternative
- Airport layout plan (ALP)

The **inventory** describes the history of the airport property development, including issues that led to the current layout. The inventory comprises descriptions of:

- The existing airside facilities, including runway, taxiway, hangars, aprons, NAVAIDS, etc.
- Airport classification or Airport Reference Code (ARC)
- Existing based aircraft and activity levels
- Roadway access and parking locations
- Utilities
- Topography and environment
- Land use and zoning
- Airspace
- Meteorological conditions

**Forecasts** should take into account socioeconomic trends, historical aviation activity, air service forecasts (if applicable), including both operations and passengers, general aviation forecasts for both based aircraft and operations, and other forecasts, such as:

- Fleet mix
- Instrument operations
- Peak activity levels
- Day/night split
- Air taxi
- Military

The master plan should also identify the facility requirements for both the airfield and the terminal. Airfield requirements may include:

- Capacity
- NAVAIDS
- Runway and taxiway requirements
- Pavement requirements
- Air traffic control (if applicable)

Terminal facility requirements may include access, parking, and the needs of general aviation, such as hangars, aprons, and fixed base operator (FBO) facilities. Other needs include aircraft rescue and firefighting, fueling, sewer and water, and storage for maintenance operations.

The master plan may include **concepts** for the airfield, terminal, and general aviation. All alternatives are evaluated, with preliminary costs, environmental impacts, and identified needs outlined.

The purpose of the **environmental overview** is to briefly examine how the proposed improvements will affect the surrounding community and environment. It does not include any detailed analysis and usually only includes those categories that could have impacts. The categories to consider are:

- Noise
- Compatible land use
- Social impacts
- Induced socioeconomic impacts
- Air quality
- Water quality
- Wetlands
- Section 4(f)
- Historic, architectural, archaeological, and cultural resources
- Biotic communities
- Endangered and threatened species
- Floodplains
- Coastal zone management
- Coastal barriers
- Wild and scenic rivers
- Farmland
- Energy supply and natural resources
- Light emissions
- Solid waste and hazardous material impacts
- Construction impacts

Other optional tasks that may be included in the master plan include a scheduled air service study, an economic impact study, a noise analysis, and a financial plan.

Finally, the **preferred alternative** is detailed in the **airport layout plan**.



***Additional Resources***

For more information on developing a master plan, see FAA AC 150/5070-6A, *Airport Master Plans*, and AC 150/5300-13, *Airport Design*, which describe the process.



## Developing an Airport Layout Plan: Identifying the Planned and Recommended Development at an Airport

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An Airport Layout Plan (ALP) incorporates recommendations of the master plan. The FAA requires that an ALP be current if federal money is to be used on a project (see FAA Advisory Circular 150/5300-13 Appendix 7).

All sheets of an ALP must be prepared on 22” by 34” paper and contain:

- An appropriate scale that varies by sheet
- A north arrow showing both true and magnetic north
- A title and revision block
- A legend

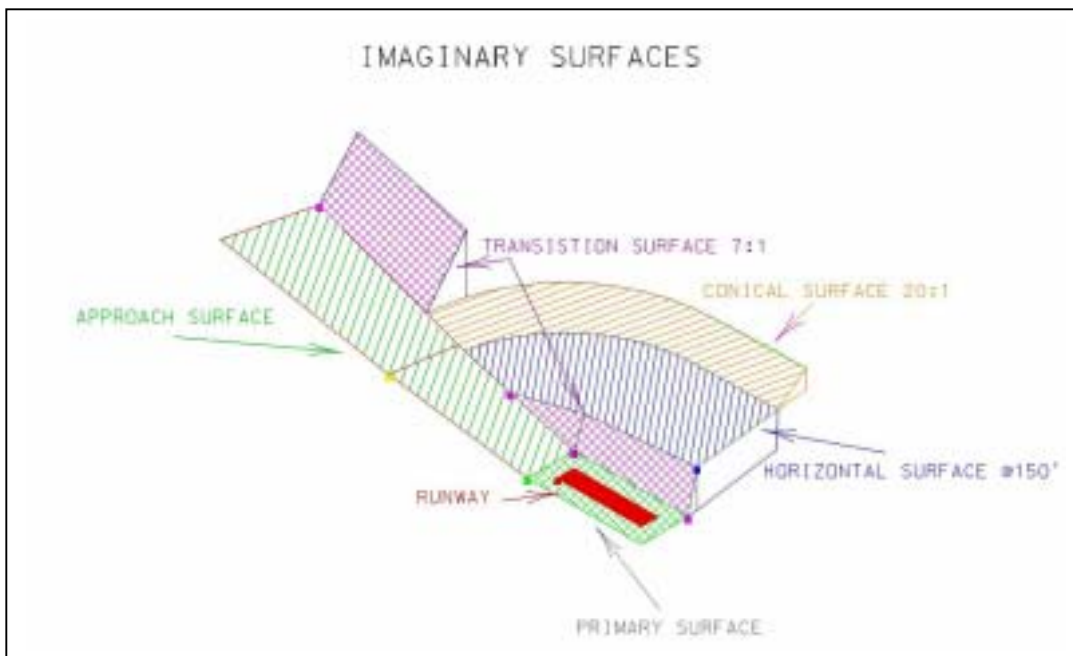
The ALP is typically made up of the following components:

- 1) A **title sheet**, which should include:
  - A schematic drawing of the airport
  - An airport data table
  - Wind rose and data
  - Location and vicinity maps
  - Approval blocks for
    - the sponsor
    - the FAA
    - Mn/DOT
    - the consultant
- 2) The **ALP sheet**, which should include:
  - Existing and proposed facilities and features
  - Airport reference point
  - All topographic information
  - Elevations, runway end, high point of runway, and structure heights (MSL)
  - Building restriction lines
  - Obstructions
  - Property: both existing and that which is to be acquired, by type
  - A runway and taxiway data table that shows
    - Approach visibility minimums
    - Dimensions
    - Pavement design strength
    - Orientation (true bearing)
    - Lighting and marking
    - Stage length
    - End coordinates
    - Monuments
    - Declared distances
  - Object Free Areas (OFA)

- Runway Safety Areas (RSA)
- Obstacle Free Zone (OFZ)
- Threshold details
- RPZ details
- Hold position signs and markings
- Taxiway details
- Building table

3) The **airspace drawing sheet**, which contains:

- Plan view of Federal Aviation Regulation (FAR) Part 77—Surfaces for Ultimate Lengths
- Profile view of ultimate approaches
- Obstruction data tables
- Current USGS 7-minute Quad for Plan View
- All airspace surfaces as defined by FAR Part 77 and Minnesota Aeronautics Rules 8800.1200
  - Primary surface
  - Horizontal surface
  - Conical surface
  - Approach surface
  - Transitional surface



4) The **approach surface drawing(s)**. The inner portion of these should extend to where FAR Part 77 reaches 100 feet above the runway end elevation. Approach surface drawings should include:

- One sheet for each runway end
- A plan and profile view of each runway end

- Obstruction tables that define the penetration and the proposed disposition of the obstruction
  - The vertical clearance at the approach surface edges and runway centerline for existing and ultimate development
  - All ground contours
- 5) **Terminal and/or building area drawing(s)**, which should be prepared on a large scale and show:
- Terminal
  - Hangars
  - Apron
  - Buildings
  - Parking lots
  - Tie downs

A building data table should show all buildings numbered with maximum elevations of structures, and should indicate if structures are to be removed or remain.

- 6) A **land use drawing**, which provides a plan for leasing revenue-producing areas. This can be used to determine where certain operations can take place and to develop zoning boundaries for the airport. It should include:
- The existing and recommended use of land within the ultimate airport property
  - General use categories (e.g., agricultural, recreational, industrial, aviation, commercial)
- 7) An **airport property map**, which should show:
- Property owned in fee by an airport
  - Easement interests, by type, owned by an airport
  - Table indicating how the property was acquired by each parcel
    - Previous owner
    - Acres
    - Type of acquisition
    - Year acquired
    - Funding participants

***Additional Resources***

- FAA AC 150/5300-13 Appendix 7, “Airport Layout Plan Components and Preparation”
- FAR Part 77, “Objects Affecting Navigable Airspace”
- Minnesota Aeronautics Rules 8800.1200, “Determining Air Navigation Obstructions”



## **Developing Environmental Documentation: Assessing the Impacts of Planned Development**

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The Environmental Assessment Worksheet (EAW) is a brief document outlining the facts necessary to determine if an Environmental Impact Statement is required for a proposed project. The project proposer can use a Federal Environmental Assessment in place of the EAW without prior approval from the Minnesota Environmental Quality Board.

### **Sponsor Role**

The environmental assessment process starts with the airport owner, who proposes a project, develops project alternatives, and either prepares an environmental assessment or completes the National Environmental Policy Act (NEPA) review checklist (see below). The sponsor should involve the public early in the planning process and satisfy state requirements in accordance with the Minnesota Environmental Review Program. The sponsor should also provide additional data and information to the FAA as needed.

### **FAA Role**

NEPA requires the FAA to analyze project-related environmental impacts and to provide interested parties with an opportunity to participate in the review process. The FAA evaluates sponsor decisions for compliance with federal aviation environmental, design, and airspace requirements, and approves or rejects the environmental document and project funding.

Federal Environmental Assessment (EA) impact categories are listed below:

- Noise
- Compatible land use
- Social impacts
- Induced socioeconomic impacts
- Air quality
- Water quality
- Section 4(f)
- Historic, architectural, archeological, and cultural resources
- Biotic communities
- Endangered and threatened species
- Wetlands
- Floodplains
- Coastal zone management
- Coastal barriers
- Wild and scenic rivers
- Farmland
- Energy supply and natural resources
- Light emissions
- Solid waste and hazardous materials impacts
- Construction impacts

A Federal Environmental Impact Statement (FEIS) includes:

- Creation of a Memorandum of Understanding between the FAA and the airport sponsor
- Contractor selection
- Scoping process
- Preparation of EIS draft by FAA and publication of notice of availability
- Public hearing
- Review and comment by public and agencies
- Preparation of final EIS by FAA and publication of notice of availability
- Review and comment by public and agencies
- Record of decision
- Approval for the project to proceed

***Additional Resources***

- National Environmental Policy Act (NEPA)
- CEQ Regulation 1500, Council on Environmental Quality (CEQ) *Guidelines for Preparation of Environmental Impact Statements*
- FAA Order 1050.1D, *Policies and Procedures for Considering Environmental Impacts*
- FAA Order 5050.4B, *Airport Environmental Handbook*
- FAA NEPA Review Checklist
- *State Environmental Guidelines*, Chapter 4410, “Environmental Review”



## Managing the Design Process: Developing the Plans and Specifications

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This phase of an airport project involves designing the project, developing the plans and specifications, creating the construction safety plan, bidding the project, and completing the engineer's report at the project's completion.

Elements of design include:

- The pre-design conference
- Progress meetings
- Monthly progress reports
- Primary contact for client and consultant
- References
  - FAA AC 150/5300-9A, Appendix 1
  - FAA AC 150/5320-6D, *Airport Pavement Design*

The purpose of a **pre-design conference** is to bring all stakeholders into the project in order to get their input on the project's needs and issues. It should be held early in the process and include as participants:

- The airport owner
- The design engineer
- Airport management
- Pilots' association members
- Fixed base operator (FOB) and airport business representatives
- FAA district office representatives
- The Mn/DOT regional engineer

The conference should include discussion of:

- Design parameters
- Airport safety
- Aircraft and equipment routing
- Construction operations
- Environmental considerations
- Civil rights requirements

More than one conference can be held, focusing on the needs and concerns of one group at a time. For example, one conference could focus on airport operations and be attended by the airport owner, all FBOs, and airport tenants.

Conference agenda items should include:

- Scope of work
- Design parameters
- Drainage issues
- Lighting issues
- Non-federally funded work

- Engineer's estimate
- Environmental mitigation
- Phasing needs

A good resource for the pre-design process is FAA Advisory Circular 150/5300-9A, available from the FAA or from the AirTAP office.

Once design considerations have been determined, the consultant will develop **plans and specifications** for use in bidding the project. Plans and specifications will be in accordance with FAA or Mn/DOT standards, depending on the construction item.

The sponsor will certify that 1) the plans and specs are completed in accordance with current federal standards or modification of standards approved by the FAA, 2) all development is shown on an approved airport layout plan, and 3) eligible and ineligible work have been separated.

For equipment, at least two manufacturers must be able to meet the specifications. Specifications include technical specs (refer to FAA AC 150/5370-10A) plus general, labor, and Equal Employment Opportunity (EEO) provisions.

Plans and specifications should include:

- modification to design standards
- cost estimates
  - quantities and unit costs
  - special considerations
- alternates
- project schedule
- safety plan

A **construction safety plan** provides a plan for the airport owner, contractor, and users to minimize impact on aircraft operation and not compromise the safety of aircraft operations or the contractor's workforce. Guidance for developing the construction safety plan is provided in FAA AC 150/5370-2C & PPM 5370.5A, available from the AirTAP office.

Considerations for the construction safety plan include:

- Clear routes for rescue operations
- Chain of notification and authority
- Notice to Airmen (NOTAMs) regarding runway closures, wildlife, etc.
- Changes to aircraft activity
- Threshold displacement/temporary marking
- Temporary lighting and marking
- Marking and lighting of construction equipment
- Equipment storage provisions and locations
- Responsible representatives
- Waste and disposal areas
- Construction parking

- Construction offices
- Cleanup
- Haul routes
- Security
- Noise
- Dust control
- Utilities
- Phasing
- NAVAIDs

The construction safety plan provides examples of hazardous conditions, helps ensure operational safety during the construction phase, identifies which vehicles can be on the airport and how they are to be marked, describes inspection requirements, and lists the FAA safety responsibilities.

A reference for development of the construction safety plan is in FAA AC 150/5370-2C, *Special Safety Requirements During Construction*, Appendix 1. The circular outlines requirements for safety considerations at:

- runway ends
- runway edges
- taxiways and aprons
- excavation and trenches
- stockpiles
- vehicle height
- NAVAIDs
- construction traffic
- marking and lighting closed or hazardous areas

An **engineer's design report**, as part of the plans and specifications, catalogs the design analysis and justification, layout considerations, soils and geotechnical information, existing drainage and future drainage consideration, pavement design, and all lighting and NAVAIDs included in the plans. This document is required by the FAA.

The final phase prior to actual construction of the project is **construction bidding**, which must be in accordance with 49 CFR 18.36. During this process, plans and specifications, including an itemized proposal outlining all project items and quantities, are sent to prospective bidders, and additional copies are provided for local builder's societies. Contractors prepare bids that are due by a specified date and time. Usually the project is awarded to the lowest responsible bidder based on competitive sealed bids. The sponsor must have procedures in place to resolve bid protests.

### ***Additional Resources***

The following is a list of FAA Advisory Circulars on project design:

- AC 150/5300-9A, *Predesign, Prebid, and Preconstruction Conferences for Airport Grant Projects*

- AC 150/5300-9A Appendix 1, “Agenda Items for Predesign Conference”
- AC 150/5320-6D, *Airport Pavement Design and Evaluation*
- AC 150/5370-10A, *Standards for Specifying Construction of Airports*
- AC 150-5370-2C, *Operational Safety on Airports During Construction*
- PPM 5370.5A, *Construction Safety Phasing Plan*
- 49 CFR 18.36

## **Construction Administration: Managing the Project's Completion**

After an airport project has been designed and bid, the focus of the project turns to managing the construction process. During this phase, the project will be constructed according to the plans and specifications. Concerted management is required to keep the project within budget and on schedule.

Construction administration includes:

- Developing a construction management plan
- Holding a pre-construction conference
- Executing partial pay requests
- Processing change orders
- Keeping observation reports
- Managing reimbursements and contractor retainment
- Project closeout

The first element, a **construction management plan**, is required by the FAA for all grants that include paving work estimated to exceed \$250,000. The plan covers:

- Personnel and their responsibilities
- Inspection procedures to be followed
- Submittal processes
- Quality control testing needs and requirements
- Acceptance testing procedures
- Reporting and recording of test results
- Final test and quality control report

Before construction begins, a **pre-construction conference** should be held to identify the roles of all parties involved, submittal and pay request processes, testing requirements, utility relocations, and the construction safety requirements. A sample agenda describes:

- The role of the resident engineer and others involved in the project
- Materials testing
- Submittals
- Utilities
- Progress reports
- Construction safety plan
- DOL and EEO requirements

The contractor and all major subcontractors should attend this meeting, in addition to the design engineer, Mn/DOT engineer, airport and FBO representatives, and representatives from involved airport users (such as pilots and commercial users).

A sample weekly report can be obtained from the AirTAP office. Another good resource is FAA Advisory Circular 150/5300-9A, which outlines the requirements for the pre-construction conference.

**Executing partial pay requests** is another vital element of construction administration. Actual field quantities should be measured and quantified monthly and processed promptly. Because the timing of partial pay requests is important, owners are encouraged to draw down every 30 days during the project if more than \$10,000 in costs is incurred, and within 30 days of the end of a fiscal year if any outstanding accrued costs remain. Also, pay requests should be made to enable the contractor to be reimbursed in an acceptable amount of time. Base pay request submittals on approval requirements, such as the schedule for county board or city council meetings.

### **Cash Flow Considerations**

Coordination of cash flow is another important element in construction administration. Since an airport owner can be required to pay out a significant amount of cash prior to being reimbursed, contractor and consultant pay requests should be coordinated with the state and the FAA (if applicable).

To illustrate the cash flow considerations, typical projected costs and cash flow for a sample project are given below.

The funding is obtained from a federal and state grant as follows:

#### **Federal Grant**

- Need to provide bid prices for grant application
- 90 percent of eligible costs reimbursed
- 10 percent of eligible costs paid by local owner

#### **State Grant**

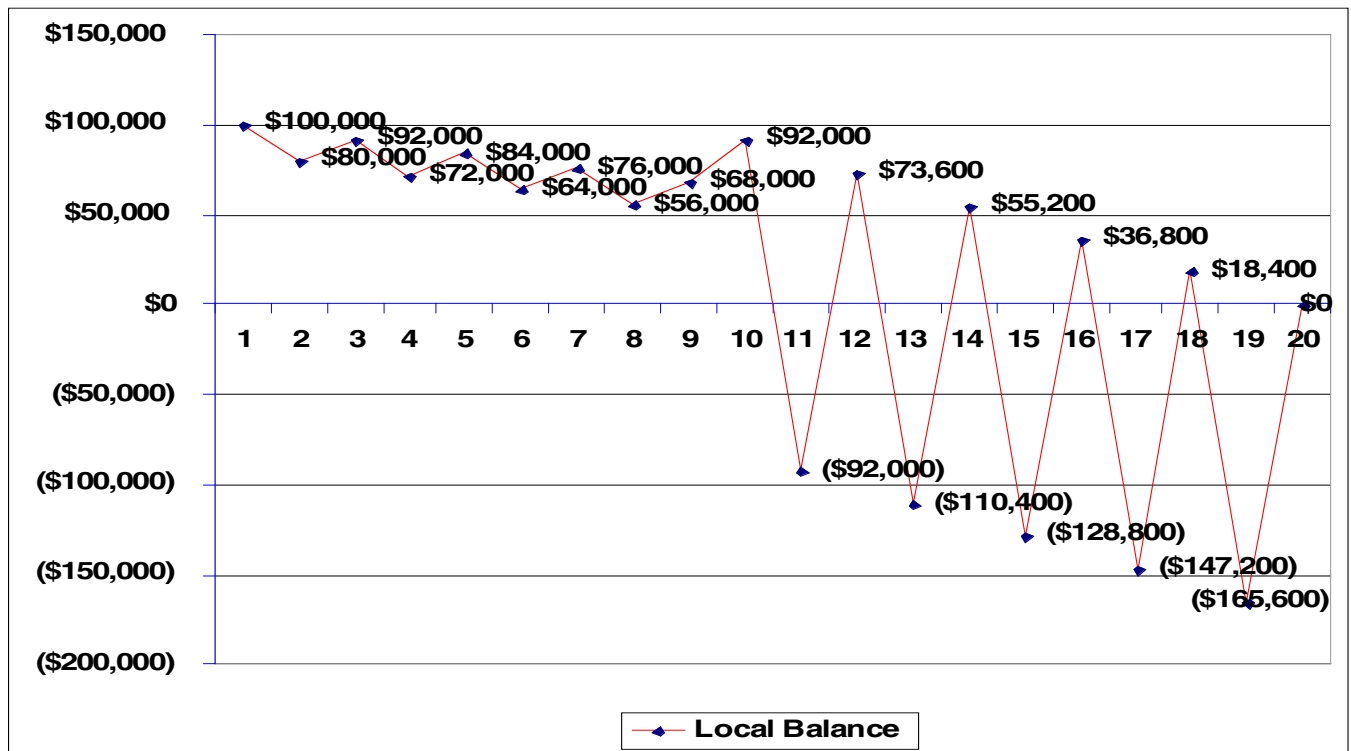
- Can be used to fund design services
- 60 percent of eligible costs reimbursed
- 40 percent of eligible costs paid by local owner

The airport owner may seek federal reimbursement for design after the project is bid.

For the sample project:

- Assuming a four-month design process, there will be four \$20,000 invoices from the consultant.
- Assuming a five-month construction schedule, there will be five \$20,000 invoices from the consultant and five \$164,000 pay requests from the contractor.

The graph below shows the local share as a balance over the duration of the project.



### Processing Change Orders

The FAA allows **contract amendments** to cover cost overruns and changes in the scope of work for eligible items. These are called **change orders**.

Cost overruns are capped at the following maximums:

- Primary airports: up to 15 percent
- Non-primary airports:
  - up to 15 percent for development, or
  - up to 15 percent of the original total grant amount or 25 percent of the total increase in allowable land costs, whichever is greater

Resident inspection can include full- or part-time **resident observation**. Selection of one over the other depends on the type of construction activity being performed and the contract cost.

Construction specifications are included in the *Standards for Specifying Construction of Airports* and *Quality Control of Construction Projects* (FAA Advisory Circulars 150/5370-2C, 5370-10A, 5370-12 and 5370-14, Appendix 1).

For airport owners who choose to perform construction inspection on their own, the University of Minnesota T<sup>2</sup> Center and AirTAP office can provide many resources to help “do-it-yourselfers,” including:

- The *Airfield Pavement Maintenance Handbook*
- Concrete and asphalt pavement distress manuals
- The *Concrete Pavement Maintenance Handbook*
- Inspector guides
- Mn/DOT technical certification courses

The last phase of a construction project is the **project closeout**. Closeout requires:

- Final inspection
- Final payment
- The sponsor’s project closeout report
- Financial summary
- Construction progress information
- Land acquisition information
- Equipment acquisition and installation

FAA PPM 5100.8B is a valuable resource for the final closeout process.

#### ***Additional Resources***

The following is a list of FAA Advisory Circulars on project design:

- AC 150/5300-9A, *Predesign, Prebid, and Preconstruction Conferences for Airport Grant Projects*
- AC 150/5370-2C, *Operational Safety on Airports During Construction*
- AC 150/5370-12, *Quality Control of Construction for Airport Grant Projects*
- AC 150/5370-14, Appendix 1
- PPM 5100.8B, *Audits and Project Closeouts*



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