

# Chapter 5 - Airport Layout Plans

## Introduction

- a. This chapter provides guidance in the preparation of the drawings that make up the Airport Layout Plan (ALP) drawing set. The intent of this chapter is to discuss the procedures that should be considered in preparing the plans. The ALP depicts existing airport facilities and proposed developments as determined from the review of the existing aviation activity, forecasts, facility requirements, and land uses. Engineers and planners should identify environmental issues early in any project scoping process to ensure an environmental strategy to these issues is addressed in the ALP. See 5.9 for environmental notes.
- b. FAA Order 5100.38, *Airport Improvement Program Handbook*, Chapter 4, *Planning Projects*, Section 3, *Planning Project Accomplishment*, paragraph 428, *FAA Approval Actions*, provides supplemental guidance for the preparation of an ALP. Unites States Code (USC) 47107(a) (16) requires a current ALP with both sponsor and FAA approval to ensure the safety, utility and efficiency of the airport. Per Order 5100.38, an ALP remains current for a five-year period, or longer, unless major changes at the airport are made or planned.
- c. The ALP preparer must work closely with the airport sponsor, FAA Southwest Regional Airports Office, and the LA DOTD Aviation Section to define the requirements, standards, and criteria to be employed. To ensure that the ALP is comprehensive, all parties must agree to its content and standards.
- d. The ALP graphically depicts current and future airport facilities. The remaining drawings included in the ALP drawing set are considered appended to the ALP and are a part of it.
- e. The five primary functions of the ALP plans that define its purpose are:
  - 1) An approved plan is necessary for the airport to receive financial assistance under the terms of the Airport and Airway Improvement Act of 1982 (AIP), as amended, and to be able to receive specific Passenger Facility Charge funding. An airport must keep its ALP current and follow that plan, since those are grant assurance requirements of the AIP and previous airport development programs, including the 1970 Airport Development Aid Program (ADAP) and Federal Aid Airports Program (FAAP) of 1946, as amended. While ALPs are not required for airports other than those developed with assistance under the aforementioned Federal programs, the same guidance is to be applied to all Louisiana public use airports.
  - 2) An ALP creates a blueprint for airport development by depicting proposed facility improvements. The ALP provides a guideline by which the airport sponsor can ensure that development maintains airport design standards and safety requirements, and is consistent with airport and community land use plans.

- 3) The ALP is a public document that serves as a record of aeronautical requirements, both present and future, and as a reference for community deliberations on land use proposals and budget resource planning.
  - 4) The approved ALP enables the FAA to plan for facility improvements at the airport. It also allows the FAA to anticipate budgetary and procedural needs. The approved ALP will also allow the FAA to protect the airspace required for facility or approach procedure improvements.
  - 5) The ALP can be a working tool for the airport sponsor, including its development and maintenance staff.
- f. The ALP drawing set is a set of planning drawings and is not intended to provide design engineering accuracy. Individual items such as runway coordinates, obstruction survey data, and application of airport design standards must comply with FAA No. 405, Standards for Aeronautical Surveys and Related Products. The ALP preparer will need to define accuracy requirements for specific elements of the ALP in cooperation with the airport sponsor and Louisiana DOTD Aviation.
- g. Airport Layout Plans are prepared either as first time ALPs, formal revisions based on major changes to the airport, or informal revisions based on minor improvements to the airport. Informal revisions, often referred to as pen-and-ink revisions, can be made to individual sheets of the ALP drawing set, although the responsibility for review and approval must still be coordinated with the FAA. These and other requirements are discussed in FAA Order 5100.38, *Airport Improvement Program Handbook*.

## Airport Layout Plan Drawing Set

- a. The individual sheets that comprise the Airport Plans drawing set will vary with each planning effort. The ALP preparer, sponsor, FAA and the LA DOTD Aviation Section must determine which sheets are necessary during the project scoping activities.
- b. Drawings that might be included in the Airport Plans drawing set are described below. Drawing Plan Sheets that are required as minimum ALP components are identified as required (See 5.2a, 5.2b, 5.2c):
  - 1) **Cover Sheet** – A separate cover sheet, with approval signature blocks, airport location maps, and other pertinent information as required by the local FAA airports office.
  - 2) **Airport Layout Plan** – (Required) A drawing depicting the existing and future airport facilities. The drawing should include required facility identifications, description labels, imaginary protection areas, Runway Protection Zones, Runway Safety Areas and basic airport and runway data tables. Figure 5-1 is an example of an ALP.
  - 3) **Airport Data Sheet** – A separate sheet containing basic airport and runway data tables.

- 4) **Facilities Layout Plan** – This drawing is essentially a simplified ALP. It depicts existing and future facilities, and only critical, non-overlapping clearance criteria, with minimal text.
- 5) **Terminal Area Plan(s)** – This plan consists of one or more drawings that present a large-scale depiction of areas with significant terminal facility development. Such a drawing is typically an enlargement of a portion of the ALP. At a commercial service airport, the drawing would include the passenger terminal area, but might also include general aviation facilities and/or cargo facilities.

## Airport Layout Plan Drawing – (Figure 5.2)

A complete ALP consists of several components. (The ALP must, as a minimum, also have the elements noted below as required).

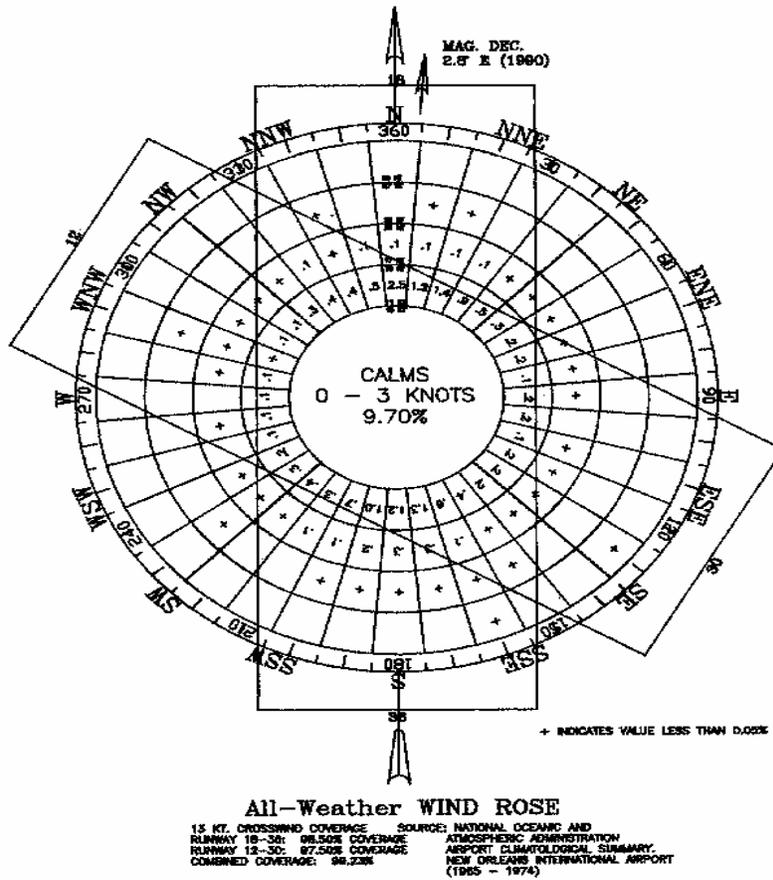
- a. Sheet size – 24” x 36”
- b. Scale – Within a range of 1” = 200’ to 1” = 600’
- c. North Arrow
  - 1) True and Magnetic North
  - 2) Year of the magnetic declination
  - 3) Orient drawing so that north is to the top or left of the sheet
- d. Wind Rose – (Figure 5.2)
  - 1) Data source and the time period covered
  - 2) Include individual and combined coverage for:
    - a) Runways with 10.5 knots crosswind
    - b) Runways with 13 knots crosswind
    - c) Runways with 16 knots crosswind
    - d) Runways with 20 knots crosswind
- e. Airport Reference Point (ARP) – Existing and ultimate with latitude and longitude to the nearest second based on NAD 83
- f. Ground contours at intervals of 2’ to 10’ lightly drawn
- g. Elevations (Existing and Ultimate to 1/10 of a foot)
  - 1) Runway

- 2) Displaced thresholds
  - 3) Touchdown zones
  - 4) Intersections
  - 5) Runway high and low points
  - 6) Roadways where they intersect the RPZ edges and extended runway centerlines
  - 7) Structures on Airport. If a terminal area plan is not included, show structure top elevations on this sheet.
- h. Building limit lines – Show on both sides of the runways and extend to the airport property line or RPZ.
- i. Runway Details (Existing and Ultimate)
- 1) Dimensions – length and width within the outline of the runway
  - 2) Orientation – Runway end numbers and true bearing to the nearest 0.01 degree
  - 3) Markings
  - 4) Lighting – Threshold lights only
  - 5) Runway Safety Areas. Dimensions may be included in the Runway Data Table
  - 6) End Coordinates – Note near end (existing and ultimate) of each runway end to nearest 0.01 second
  - 7) Displaced threshold coordinates to the nearest 0.01 second
  - 8) Declared Distances – For each runway direction if applicable. Identify any clearway/stopway portions in the declared distances
- j. Taxiway details (Existing and Ultimate)
- 1) Taxiway widths and separations from the runway centerlines, parallel taxiway, aircraft parking, and objects
- k. RPZ Details (Existing and Ultimate)
- 1) Dimensions
  - 2) Type of property acquisition (fee or easement)
  - 3) Approach slope ratio (20:1; 34:1; 50:1)

1. Airport Data Table (Existing and Ultimate) – (Table 5.1)
  - 1) Airport elevation (MSL)
  - 2) Airport Reference Point (ARP) Data
  - 3) Mean maximum temperature
  - 4) Airport Reference Code (ARC) for each runway
  - 5) Design Aircraft for each runway or airfield component
- m. Runway data Table (Existing and Ultimate) – (Table 5.2)
  - 1) % effective gradient
  - 2) % wind coverage
  - 3) Maximum elevation above MSL
  - 4) Runway length and width
  - 5) Runway surface type
  - 6) Runway strength
  - 7) Part 77 approach category
  - 8) Approach type
  - 9) Approach Slope
  - 10) Runway lighting (HIRL, MIRL, LIRL)
  - 11) Runway marking
  - 12) NAVAIDs and visual aids
  - 13) RSA dimensions
- n. Title and Revision Blocks
  - 1) Name and location of the airport
  - 2) Name of preparer
  - 3) Date of drawing
  - 4) Drawing title

- 5) Revision block
- 6) FAA disclaimer
- 7) Approval block
- o. Other
  - 1) Standard Legend
  - 2) Existing and Ultimate airport facility and building list
  - 3) Location Map
  - 4) Vicinity Map





	RUNWAY 18		RUNWAY 36	
	EXISTING	ULTIMATE	EXISTING	ULTIMATE
EFFECTIVE GRADIENT (IN %)	+0.04	SAME	-0.04	SAME
% WIND COVERAGE	96.0	SAME	96.0	SAME
INSTRUMENT RUNWAY	FULL ILS	SAME	NON-PRECISION	FULL ILS
PAVEMENT STRENGTH	50 S, 75 D, 137 DT	SAME	50 S, 75 D, 137 DT	SAME
APPROACH SURFACES	50:1	SAME	34:1	50:1
RUNWAY LIGHTING	MIRL	SAME	MIRL	SAME
RUNWAY MARKING	PRECISION	SAME	PRECISION	SAME
NAVIGATIONAL AIDS	MALSR, PAPI, ILS	SAME	REILS, PAPI	REILS, PAPI, ILS
	RUNWAY 12		RUNWAY 30	
	EXISTING	ULTIMATE	EXISTING	ULTIMATE
EFFECTIVE GRADIENT (IN %)	+0.06	SAME	-0.06	SAME
% WIND COVERAGE	93.3	SAME	93.3	SAME
INSTRUMENT RUNWAY	NON-PRECISION	FULL ILS	SAME	FULL ILS
PAVEMENT STRENGTH	50 S, 75 D, 137 DT	SAME	50 S, 75 D, 137 DT	SAME
APPROACH SURFACES	34:1	50:1	34:1	50:1
RUNWAY LIGHTING	MIRL	SAME	MIRL	SAME
RUNWAY MARKING	NON-PRECISION	PRECISION	NON-PRECISION	PRECISION
NAVIGATIONAL AIDS	REILS, PLASI	REILS, PAPI	VASI-II	PAPI

**Table 5.2: Basic Runway Data Table**

## Airport Airspace Drawing – (Required - Figure 5-4)

A drawing depicting obstacle identification surfaces for the full extent of all airport development, per 14 CFR Part 77, Objects Affecting Navigable Airspace. It should also depict airspace obstructions for the portions of the surfaces excluded from the Inner Portion of the Approach Surface Drawing.

- a. Plan view of all Part 77 surfaces based on ultimate runway lengths
- b. Small scale profile views of existing and ultimate approaches

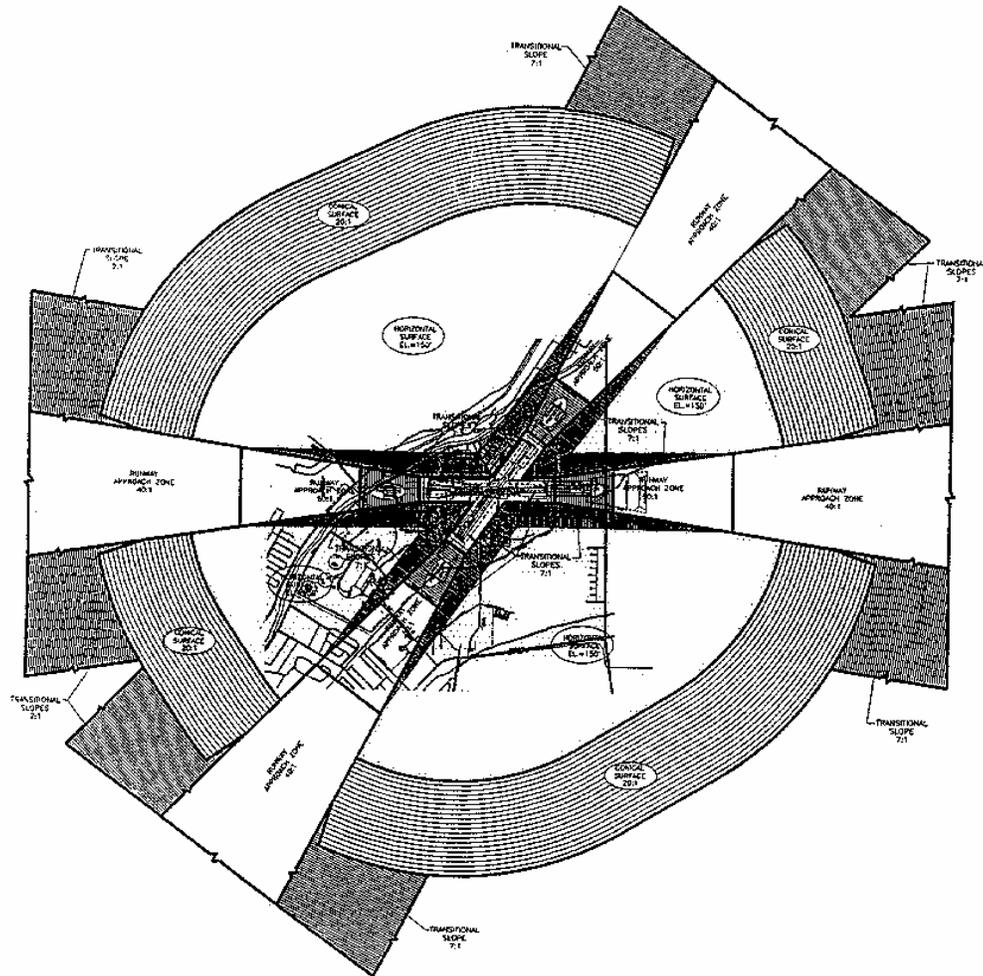
- c. Obstruction data tables, as appropriate
- d. Sheet size – same as the airport layout drawing
- e. Scale – 1” = 2,000’ for the plan view; 1” = 1,000’ for approach profiles; and 1” = 100’ (vertical) for approach profiles
- f. Title and revision blocks - same as the airport layout drawing
- g. Approach Plan View Details –
  - 1) USGS for base map
  - 2) Show runway end numbers
  - 3) Include 50’ elevation contours on all slopes
  - 4) Show the most demanding surfaces with solid lines and others with dashed lines
  - 5) Identify top elevations of objects that penetrate any of the surfaces. For objects in the inner approach, add note “See inner portion of the approach plan view for close in obstructions.”
  - 6) For precision instrument runways show balance of 40,000’ approach on separate sheet.
- h. Approach Profile Details
  - 1) Depict the ground profile along the extended runway centerline
  - 2) Identify all significant objects (roads, rivers, etc.) and top elevations within the approach surfaces regardless of whether they are obstructions

## **Inner Portion of the Approach Surface Drawing – (Required Figure 5-4)**

Drawings containing the plan and profile view of the inner portion of the approach surface to the runway and a tabular listing of all surface violations. The drawing will depict the obstacle identification approach surfaces contained in 14 CFR Part 77, *Objects Affecting Navigable Airspace*. The drawing may also depict other approach surfaces, including the threshold-siting surface, those surfaces associated with United States Standards for Instrument Procedures (TERPS), (See Advisory Circular 150/5300-13 Appendix 16 Change 6 (or latest edition). The extent of the approach surface and the number of airspace obstructions shown may restrict each sheet to only one runway end or approach.

- a. Large scale plan views of inner portions of approaches for each runway, usually limited to the RPZ areas

- b. Large scale projected profile views of inner portions of approaches for each runway, usually limited to the RPZ areas
- c. Interim stage RPZs when plans for interim runways extensions are firm and construction thereof is reasonably assured in the near future
- d. Sheet size – Same as Airport Layout drawing
- e. Scale – Horizontal 1" = 200'; vertical 1" = 20'
- f. Title and revision blocks – Same as for Airport Layout drawing
- g. Plan View Details
  - 1) Aerial photos for base maps
  - 2) Numbering system to identify obstructions
  - 3) Depict property line
  - 4) Identify by numbers all traverse ways with elevations and computed vertical clearance in the approach
  - 5) Depict the existing and ultimate physical end of the runways. Note runway end number and elevation
  - 6) Show ground contours lightly drawn
- h. Profile View Details
  - 1) Depict terrain and significant items (fences, roadways, etc.)
  - 2) Identify obstructions with numbers on the plan view
  - 3) Show roads and railroads with dashed lines at edge of the approach
- i. Obstruction Table Details
  - 3) Prepare a separate table for each RPZ
  - 4) Include obstruction identification number and description, the amount of the approach surface penetration and the proposed disposition of the obstructions
  - 5) Show existing and ultimate runway ends and FAR Part 77 approach slopes.



**Figure 5.4: Airport Airspace And Runway Protection Zone Drawing**

## Airport Property Map

A drawing depicting the airport property boundary, the various tracts of land that were acquired to develop the airport, and the method of acquisition. If any obligations were incurred as a result of obtaining property, or an interest therein, they should be noted. Obligations that stem from Federal grant or an FAA-administered land transfer program, such as surplus property programs, should also be noted. The drawing should also depict easements beyond the airport boundary.

- a. Sheet size – Same as Airport Layout drawing
- b. Scale – Same as the Airport Layout drawing
- c. Title and revision blocks – Same as for Airport Layout drawing
- d. Legend
- e. Data Table

- 1) Use a numbering or lettering system should be used to identify tracts of land
  - 2) The date the property was acquired
  - 3) The Federal aid project number under which it was acquired
  - 4) Type of ownership (fee, easement, federal surplus, etc.)
- b. Show existing and future airport features (i.e., runways, RPZs, NAVAIDs, etc.) that would indicate aeronautical need for airport property.

## Airport Utility Drawing

This drawing depicts the location and capacity of major overhead utilities and or underground on the airport and in the surrounding area. The need for this drawing will be decided on a case-by-case basis. For small airports, where the Airport Layout drawing is prepared to a fairly large scale, a separate drawing for the major overhead or underground utilities may not be needed.

- a. Large scale plan view of the area or depicting utility feeder routes, etc. are located
- b. Sheet size – Same as Airport Layout drawing
- c. Scale – Range of 1" = 50' to 1" = 100'
- d. Title and revision blocks – Same as for Airport Layout drawing
- e. Utility Data Table – For listing overhead structures and showing pertinent information relative to them. Include space and columns for:
  - 1) Use numbering system to identify structures
  - 2) Include top elevation of overhead structures
  - 3) Identify existing and planned obstruction marking

## Airport Terminal Area Plan Drawing

This plan consists of one or more drawings that present a large-scale depiction of areas with significant terminal facility development. The need for this drawing will be decided on a case-by-case basis. For small airports, where the Airport Layout drawing is prepared to a fairly large scale, a separate drawing for the terminal area may not be needed.

- a. Large scale plan view of the area or areas where aprons, buildings, hangars, parking lots, etc. are located
- b. Sheet size – Same as Airport Layout drawing
- c. Scale – Range of 1" = 50' to 1" = 100'

- d. Title and revision blocks – Same as for Airport Layout drawing
- e. Building Data Table – For listing structures and showing pertinent information relative to them. Include space and columns for:
  - 1) Use numbering system to identify structures
  - 2) Include top elevation of structures
  - 3) Identify existing and planned obstruction marking

## **Airport Access Plan Drawing**

If access to the airport is a significant issue, a separate airport access drawing should be created, depicting the major routes of various modes of transportation that serve the airport. Such a drawing could also include proposed improvements to the system.

- a. Large scale plan view of the area access depicting the major operational access routes and proposed construction access
- b. Sheet size – Same as Airport Layout drawing
- c. Scale – Range of 1" = 50' to 1" = 100'
- d. Title and revision blocks – Same as for Airport Layout drawing
- e. Access Route Data Table – For listing access route names and showing pertinent information relative to them. Include space and columns for:
  - 1) Show assigned identity of the access route(s)
  - 2) Include type of construction (Asphalt, Concrete, etc.)
  - 3) Identify existing weight bearing limits or proposed increases

## **Off-Airport Land Use Plan Drawing**

A drawing depicting land uses and zoning in the area around the airport. At a minimum, the drawing must contain land within the 65 DNL noise contour. For general aviation airports or low activity commercial service airports, where noise issues are less important, on-airport land use and off-airport land use may be combined.

- a. Include all land uses (industrial, residential, etc.) off the airport to at least the 65 DNL contour
- b. Sheet size – Same as Airport Layout drawing
- c. Scale – Same as the Airport Layout drawing

- d. Title and revision blocks – Same as for Airport Layout drawing
- e. Aerial base map
- f. Legend (symbols and land use descriptions)
- g. Identify public facilities (e.g., schools, parks, etc.)
- h. Drawing details – Normally limited to existing and future airport features (i.e., runways, taxiways, aprons, RPZs, terminal buildings and NAVAIDS)

## **On-Airport Land Use Plan Drawing**

A drawing depicting the land uses within the airport property boundary.

- a. Include all land uses (industrial, etc.) on the airport to at least the 65 DNL contour
- b. Sheet size – Same as Airport Layout drawing
- c. Scale – Same as the Airport Layout drawing
- d. Title and revision blocks – Same as for Airport Layout drawing
- e. Aerial base map
- f. Legend (symbols and land use descriptions)
- g. Identify public facilities (e.g., schools, parks, etc.)
- h. Drawing details – Normally limited to existing and future airport features (i.e., runways, taxiways, aprons, RPZs, terminal buildings and NAVAIDS)

## **Agricultural Aviation Operations Area**

Airports that have agricultural aviation operations should designate an area that will be used only for such operations on their ALP. An agricultural operations area should be defined as the area on an airport that is used for loading agricultural airplanes. Depending on the volume of agricultural operations and whether it is economically feasible, it may be necessary to add an additional designated operational area. One area can be designated for the handling of liquid chemicals and the other area can be designated for the handling of dry non-toxic materials.

The designated agricultural operations area should be considered a special purpose area and should be designed to operate separately from the general aviation areas of the airport. This will allow the area to be restricted to agricultural aircraft and their support equipment only and will yield the highest level of safety and efficiency. In addition, the area should also restrict access from any public roads and any unauthorized personnel from the agricultural operations area.

### **a. Chemical Handling Area**

The chemical handling area should be located within the designated agricultural area. This area will be used for all aspects of handling liquid chemicals used for agricultural operations. Some of the aspects of handling liquid chemicals will include:

- Chemical handling
- Chemical mixing
- Loading or discharging chemicals onto or from the agricultural aircraft
- Washing the aircraft's internal spray system

Due to the fact that asphalt pavements tend to absorb spilled liquids and the effects of some of the liquid herbicides on asphalt pavements are unknown, it is recommended that the chemical handling area be designated only on Portland Cement Concrete aprons. This area should be underlaid with a material that will not allow any seepage through to the underlying soil. This portion of the apron should be located away from drainage courses that might collect any chemical spills and thus contaminate the storm water drainage system. This apron area should also be sloped to a collection drain that will collect any spills and also collect any wash water. The liquids collected should be disposed of according to all Louisiana DEQ regulations and by a licensed non-hazardous waste disposal company and should be prohibited from entering the storm drainage system.

### **b. Dry Material Loading Area**

Generally, when aircraft agricultural operations use dry non-toxic materials, an area needs to be designated to allow enough space for the loading and unloading of this material. This area needs to allow room for the transport trucks delivering the material, the aircraft, and the hopper trucks that transfer the material from the transport trucks into the aircraft. Since these areas can be quite large, it may not be economically feasible to establish an area specifically for material handling. In some cases, these areas can be placed adjacent to the chemical handling areas, at closed runways or taxiways, or if large enough, on the general aviation apron. In each case, these areas should be restricted and kept separate from general aviation activities.

### **c. Herbicide Material Storage**

When dealing with herbicides and other chemicals, it is of primary concern that these materials are kept in a clean, secured, locked area. Improper storage, use and disposal of these materials can result in environmental contamination. The best way to prevent pollutant problems is at the source. Prevent or reduce the discharge of these pollutants by storing materials in a designated area, by installing secondary containment, by conducting regular inspections, and by training all employees on the proper uses of these materials.

As stated, a chemical handling area should be designated on the ALP for material delivery and storage. The airport's tenants must keep accurate, up-to-date inventory of the materials delivered and stored on-site. This will help in determining what type of response is needed in the event of a spill. Tenants should keep their inventory low by storing only the amount of materials that they need for a specific task. Whenever possible, store materials in a covered and/or enclosed area with a secondary containment such as an earthen dike, metal pan, or other containment

device. These materials should not be stored directly on the ground. Drums or bagged materials should be placed on pallets and covered to prevent exposure to rainwater.

The designated storage area should be kept clean and well organized. The designated storage area should be routinely checked for external corrosion of material containers. An ample supply of spill cleanup materials should also be kept near the storage area.

## CAD Design Standards

- a. ALP drawings are produced electronically using computer-aided design (CAD) software. The sponsor and the LA DOTD Aviation Section will select what program, to use. Either may also have CAD standards that they want to be used in the drawings. The CAD standards may include, for example, defined line types, line weight/thickness, lettering styles, symbols, and file-naming conventions. The sponsor, FAA and/or LA DOTD Aviation Section must determine which standards must be followed in development of the Airport Plans drawing set.
- b. Following CAD standards will facilitate the review and approval of the drawings by the FAA, mitigate the chance of misunderstanding the drawings, produce drawings that are useful for the LA DOTD Aviation Section statewide planning efforts and the airport sponsor, and produce drawings that may be used in subsequent planning and design efforts.

## Geographic Information Systems

- a. Geographic Information Systems (GIS) is computer-based software that links geographic location, or mapping, to various databases, may be used by the airport sponsor for a number of purposes, including: the inventory and maintenance of airport facilities, preparation for emergency services, planning for airport improvements, the inventory of airport property, and the inventory of sensitive environmental areas
- b. The ALP may be linked to an existing GIS or the airport sponsor may implement a new GIS incorporating the ALP. The ALP preparer should understand the intended use of the GIS and the associated ALP standards and requirements. The ALP standards may include specific CAD standards for GIS compatibility and ALP requirements may include specific facility and data needed for GIS applications. For example, a GIS database including the airfield lighting and signage will define a portion of the inventory and mapping effort. Similarly, a GIS used for emergency services or analysis of airport access may require mapping of the local road network.

## Base Mapping and Data Sources

Base mapping and data source issues should be discussed as part of the plan scoping, since they may affect not only the plans, but also subsequent environmental matters. These issues might include the following:

- a. **Base Mapping** – The level of detail required for the base mapping for the ALP must be determined by the sponsor, FAA and LA DOTD Aviation Section, and the ALP preparer. Although some sponsors may already have the necessary data, often new base mapping will be required. Base mapping is typically done at the outset of the planning effort and is used in the facility requirement determination and preferred alternatives analysis and selection. Since these processes ultimately establish the total area that will be depicted on the drawings, the preparer should establish the area that must be mapped by considering the following:
- Potential airport expansion beyond the existing boundaries
  - The extent of noise contours
  - Location of other potential environmental impact areas
  - The area required to address ground access issues
  - The area to be depicted on the Approach Surface Drawing
  - Implications of the use of GIS

The ALP preparer will need to determine what intervals of topographical contours to use on the maps. Topographic issues may be important in the alternatives analysis and require reduced contour intervals.

The ALP prepared should also consider how to analyze airspace obstructions and violations. If aerial photogrammetry is used for the obstruction analysis, mapping can be paired with it, but parameters for both products must be established.

- b. **Airspace Obstruction Identification and Analysis** – An assessment of airspace obstructions near the airport should be included on the Approach Surface Drawings and the Airspace Drawing. The ALP preparer and reviewing agency must establish data sources and parameters for this assessment. Obstruction data sources include existing sources such as airport obstruction removal programs, previous obstruction survey data, the National Oceanic Atmospheric and Atmospheric Administration (NOAA) obstruction chart, and the FAA Digital Obstacle File. Numerous methods may be used for the inventory of new obstructions or for verification of identified obstructions, including a physical site survey using traditional methods, the use of aerial photogrammetry, and laser mapping. Obstruction analysis parameters include the extent of the approach surface that will be surveyed and analyzed and the survey of areas off the sides of the runways. Existing obstruction clearing and maintenance programs at the airport may minimize the need for extensive obstruction surveying. Conversely, development of a new airport, construction of new runways, extension, reclassification, or approach procedure revisions to existing runways may require additional surveying.
- c. **Off-Airport Property** – The airport property map will identify the parcels that were acquired to develop the airport. The airport alternatives analysis may benefit from an inventory of parcels surrounding the airport boundary, particularly in areas of anticipated

airport development. Being able to identify these parcels by size and use may also benefit potential subsequent environmental studies. The ALP preparer, LA DOTD Aviation Section, and airport sponsor should determine if expanding the property map to include these areas is necessary.

## Checklists

- a. The primary guideline for development of the ALP and drawing set is the FAA checklist incorporated herein this chapter in sections 5.2a thru 5.2i.
- b. Other checklists from the FAA Southwest Region and/or the LA DOTD Aviation Section may supplement the chapter checklist. The ALP preparer should identify applicable checklists at the outset of the project.
- c. For airports not included in the National Plan of Integrated Airports System (NPIAS), the chapter checklist applies.
- d. Planners must verify that the drawing checklists are current, since they are continually revised to reflect changing FAA and the LA DOTD Aviation Section standards.
- e. Once the applicable drawing checklists have been identified, the ALP preparer should consult with the Sponsor, FAA and LA DOTD Aviation Section to define the specific items on the checklists that are applicable to the project. The checklist herein is comprehensive and not all items are applicable to a specific project.

## Approvals

- a. The ALP drawing set approval process will vary, depending on the requirements of the FAA Southwest Region Airports Office and those of the LA DOTD Aviation Section. The sponsor, FAA, state and ALP preparer need to identify which approval process will be used at the outset of ALP preparation.
- b. Per FAA Order 5100.38, *Airport Improvement Program Handbook*, FAA review and coordination of the ALP will cover Federal interests and must consider any required coordination that was not completed at the local or state level.
- c. The review of the Airport Plans drawing set will typically be completed through multiple submittals. Milestones must be determined by the approving agency, but typically include:
  - 1) ***Preliminary ALP submittal*** – The drawing set should be submitted to the sponsor for review and comment to ensure that the graphic depictions correctly present the sponsor’s goals.
  - 2) ***Draft ALP Submittal*** – The drawing set and support documentation should be submitted to the FAA and LA DOTD Aviation Section for review and comment.

Review comments must be addressed prior to submittal of the Draft ALP drawing set for airspace review.

- 3) ***Draft ALP Airspace submittal*** – The Draft ALP drawing set should be submitted to the FAA Southwest Region Airports Office for distribution to various other FAA offices for airspace review. As noted above, in some cases the FAA may require that the Draft ALP drawing set be submitted for review and comment and then resubmitted for airspace review after their comments have been addressed. In other cases, the FAA may conduct the airspace review at the same time as their general review of the Draft ALP drawing set.
  - 4) ***Final ALP submittal*** – ALP drawing set should be revised, as needed, based on the airspace determination and review comments if these were not addressed prior to submitting the Draft ALP drawing set for airspace review. The final ALP drawing set and accompanying narrative (Master Plan Report, Action Plan Report or ALP Narrative Report) should be sent to the reviewing agency for distribution.
- d. **Conditional Approval** – The FAA will occasionally approve the Airport Plans drawing set conditionally, based on specific components that will be subject to further review and approvals prior to funding and implementation.
  - e. **Unconditional Approval** – The FAA may unconditionally approve the Airport Plans drawing set when all proposed development projects are either categorically excluded from additional environmental processing, have received a Finding of No Significant Impact from an Environmental Assessment, or have received a Record of Decision from an Environmental Impact Statement.

## Documentation Guidelines

- a. The requirements for documentation for the Airport Layout drawing set must be determined with the airport sponsor and the FAA Southwest Region Airports Office and/or Louisiana DOTD Aviation. Documentation will typically include a complete reduced-size (11 x 17) set of the Airport Plans drawing set and the accompanying text. The master plan will provide the narrative if the ALP is prepared as part of a master plan. If the ALP is prepared separately, an ALP narrative is required. The narrative will typically describe ALP development criteria, independent of other chapters of the master plan, and the rationale for the development shown on the ALP. Examples of these include airport reference code-related design criteria unique to specific areas of the airfield, or known or proposed modifications to FAA design standards.
- b. The quantity and form of ALP drawing sets must also be defined with the airport sponsor, FAA Southwest Region Airports Office and the LA DOTD Aviation Section. A reproducible mylar, full size signed original copy and multiple paper copies of the plans set may be required. Distribution requirements should be established during the project scoping.

- c. Electronic files of the Airport Plans drawing set must be prepared. These files are typically provided to the LA DOTD Aviation Section and may also be provided to the sponsor.

## Environmental Strategy

- a. Environmental strategy does not need to follow the specific impact categories outlined in the current version of FAA Order 5050.4 *Airport Environmental Handbook*. Rather, FAA Order 5050.4 should be consulted to help airport managers, engineers, and planners develop the background material for the environmental strategy for a specific airport.
- b. Engineers and planners should identify environmental issues early in the project scoping process to ensure that the budget addresses these issues.
- c. All airport development should consider appropriate Federal, State, and local environmental laws and regulations. There are approximately 40 Federal laws, executive orders, and regulations protecting particular parts of the environment, such as the Clean Air, Clean Water, Endangered Species, and National Preservation Acts, and an Executive Order on Protection of Wetlands. Louisiana DEQ may have additional environmental requirements that should also be addressed in the early stages of project development.
- d. During the project scoping process, airport managers, engineers and planners should identify short-term capital development projects that are known to trigger additional environmental processing, such as a runway extension. For such projects, the airport sponsor should consider whether the environmental processing could start before the project design process is started. The guidance can be extended to longer-term projects in the case of new airports or major reconfigurations of existing airports.
- e. Airport managers should recognize the need to achieve a balance between the manmade and the natural environment. Although every proposed development project will have some impact to the natural environment, the use of prudent planning criteria, along with sound environmental data and analysis, will help minimize environmental impacts and the delay of project design and construction.

## Elements of An Environmental Strategy

- a. **Introduction** – The purpose of an environmental strategy is to help the sponsor evaluate alternatives and to determine the environmental analyses required for each of the projects identified in a typical five year capital improvement plan. The airport manager should also understand that the environmental evaluation must be tailored to each airport's size, unique setting, and operating environment. An environmental strategy should identify the environmental processing required by the National Environmental Policy Act (NEPA) and what permits will be required.

The environmental strategy should combine the environmental inventory with the planned capital improvement projects. Capital improvement projects might include items

such as future runway extensions and aircraft apron expansions. Airport studies might include items such as an update of the airport's Storm Water Pollution Prevention Plan or the development of a storm water master plan.

- b. **Project Timing and Phasing** – Airport Managers should review the airport existing demand/capacity and facility requirements and alternatives chapters of his airport master plan or action plan to help make a list of short- intermediate-long-term projects. The timing of the proposed projects may help to identify cumulative impacts that could be associated with them. The cumulative impact is the incremental environmental impact of an action, when added to past, present, and reasonably foreseeable future actions. For example, an apron expansion may not have a significant environmental impact by itself, but if the airport sponsor also built a taxiway extension and an approach lighting system at the same time, the total or cumulative impacts may trigger additional environmental analysis. Furthermore, if a project, such as a runway extension is dependent on another component, such as an associated approach lighting system they must be evaluated together.
- c. **Key Environmental Issues Identification** – Engineers and planners should identify the key environmental issues of each development project as part of the environmental strategy plan. Categories of potential impacts are defined in the current versions of FAA Order 1050.1, *Environmental Impacts: Policies and Procedures* and FAA Order 5050.4, *Airport Environmental Handbook*. For example, if a sponsor determined that a runway extension would affect four impact categories, the environmental strategy plan would evaluate the potential impact of those four categories. This evaluation may require additional alternatives to be developed and reviewed. These specific categories and applicable environmental laws, regulations, policies, and associated permits should be clearly identified in the environmental strategy as a plan to address the specific issues.
- d. **Identification of Environmental Processing Required** – The FAA has established criteria for determining the level of environmental processing required for each project. Regulations for implementing the Procedural Provisions of the NEPA (40 CFR Parts 1500-1508), issued by the President's Council On the Environmental Quality (CEQ) are outlined in the current versions of FAA Order 1050.1, *Environmental Impacts: Policies and Procedures* and FAA Order 5050.4, *Airport Environmental Handbook*. These orders provide guidance on the level of environmental processing required for airport development projects. All Federal actions regarding airport development projects fall into three categories:
  - Those normally requiring an environmental impact statement (CEQ 1508.11)
  - Those requiring an environmental assessment (CEQ 1508.9)
  - Those projects that are normally categorically excluded (CEQ 1508.4)

The sponsor engineer and planner should consult FAA Order 5040.4 for guidance on FAA criteria for determining which category of environmental processing is appropriate for each project. In some cases, extraordinary circumstances may require an environmental assessment for a project that would normally be categorically excluded.

Funding applications require information about environmental issues for each project. A project may be eliminated from further consideration for FAA funding until the necessary environmental processing is completed.

- e. **Key Permit Identification** – Key permits needed for each project should be identified early in the project planning process and outlined in the environmental strategy for that project or series of linked projects. If key construction permits are not identified early in the project identification process, delay in the implementation of a project can result. Although such requirements can vary greatly within each locality, some of the permits that may be necessary include:
- Section 404 Dredge and Fill Permit
  - Air Quality Permit for on-site batch plants or other construction-related activities
  - Local government construction permits
  - Growth Management Permits
  - EPA, USFWS, and State Wildlife and Game Commission Permits, if protected and endangered species could be impacted.
  - National Pollution Discharge Elimination System Permits
- f. **Environmental Streamlining** – Streamlining the environmental component of the project development process is a priority for the FAA. The intent of the streamlining process is to ensure the consideration of the human and natural environments in the decision making process, as outlined in an FAA report *The Report to Congress, Environmental Review of Airport Projects*, dated May 21, 2001. Under streamlining, the FAA has encouraged environmental resource agencies to work cooperatively to complete the environmental review of projects to avoid the construction delays, unnecessary duplication of effort, and added costs often associated with current practice of reviewing and approving airport projects. Early identification of required environmental processing and permits allows the collection and analysis of environmental data to proceed on a parallel track with airport planning. The environmental strategy should identify areas of overlapping analysis of sequenced projects. An airport sponsor environmental strategy can serve as a bridge between the project planning effort and NEPA process.

## Consideration of Environmental Factors in Airport Master Planning

The FAA white paper, “Consideration of Environmental Factors in Airport Master Planning,” dated July 2001, contains recommendations for how to evaluate environmental factors in airport planning. Included herein, it contains a discussion of the interaction of the airport planning and environmental processes and recommendations for how to effectively integrate these processes. The appropriate treatment of environmental factors in airport master planning can make subsequent detailed environmental processing more efficient and speed the completion of airport development. Although the white paper is primarily intended for large and complex projects, many of the techniques in the guide can be applied to all levels of environmental clearance.

## Applications to the Project Planning Process

The project justification and selection of alternatives, including documentation of why certain alternatives were not carried forward, should be completed before the NEPA process is started. Only those alternatives that have aeronautical utility should be forwarded for NEPA analysis.

The environmental strategy should be a concise summary of the environmental actions required to implement the desired capital improvement project such as:

- a. **FAA Approval** – The major product of the planning effort is an Airport Layout Plan (ALP), showing existing and proposed facilities, on which the FAA has approval authority. An airport sponsor seeking a grant for an airport improvement project or requesting unconditional approval of the ALP should reference the current version of FAA Order 5050.4 and FAA Order 1050.1 for guidance in determining environmental requirements.
  - 1) The incorporation of environmental evaluations in the preparation of the ALP will help refine project alternatives that will minimize the potential impact on the environment.
  - 2) The FAA may unconditionally approve an ALP when all proposed development projects have been categorically excluded from additional environmental processing, have received a Finding Of No Significant Impact (FONSI) from an Environmental Assessment, or have received a favorable Record of Decision (ROD) from an Environmental Impact Statement prepared for them. When an ALP contains projects that may require additional environmental processing, the FAA may approve the ALP conditionally. A conditionally approved ALP will detail the environmental processing required by the FAA. Implementation of the project(s) should not be undertaken until the environmental processing has been completed and the FAA has approved the ALP.
- b. **Environmental Considerations in the Airport Planning Alternative Analysis** – Environmental factors must be considered during the deliberation and analysis of alternatives to avoid the selection of an alternative that is later rejected because of its environmental impacts. Considering an alternative’s environmental impacts early in the process reduces or eliminates the prospect of having to later update the Airport Layout Plan reflecting changes due to environmental considerations.
  - 1) Alternatives to a proposed capital project should provide sufficient detail regarding the justification for the project so that that the alternative analysis for the project may serve as the basis for the purpose and need section of any environmental document.
  - 2) For most airports, only a few of the environmental impact categories will need to be discussed, (such as noise, wetlands, social impacts, etc.) based on location-specific areas of concern and whether an environmental overview has recently been conducted. Engineers and planners don't need to list each specific impact category, but only those that might require mitigation. In many cases, a simple environmental

overview will be sufficient to identify those issues. Detailed impact analyses will be produced in any Environmental Assessment or Environmental Impact Statement that follows for a specific project as needed.

## Environmental Strategy Documentation Guidelines

- a. The environmental strategy for an airport should have a brief action plan for each major short- medium- and long-term project listed in the five year capital improvement plan. The plan should concisely identify the type of environmental processing needed for each project, including the FAA determination as to whether the project will be required to undergo an environmental assessment or will be categorically excluded. In addition, the plan should identify necessary local, state and federal permits for each project.
- b. Engineers and planners should use appendices for the majority of the technical documentation, such as noise analysis, wetland mapping, and threatened and endangered species reports to improve the readability and organizational flow of the environmental strategy.
- c. The environmental impacts of the Airport Layout Plan should be addressed in a candid manner, so that the public, as well as the sponsor, easily understands them.

## Summary

An ALP is one of the most important tools an airport sponsor can use. If any assistance is needed regarding putting together ALPs, please feel free to contact your respective FAA and/or LA DOTD Aviation Section program manager at the following address:

### **LA DOTD**

**Aviation Section - 88**

**P. O. Box 94245**

**Baton Rouge, LA 70804 - 9245**

**(225) 274-4125 Fax (225) 274-4181**

### **DOT/FAA**

**LA/NM ASW-640**

**2601 Meacham Boulevard**

**Fort Worth, Texas 76137-4298**

**(817) 222-5640 Fax (817) 222-5988**

## References

Federal Aviation Administration Advisory Circular, 150/5070-6B, "Airport Master Plans"

Federal Aviation Administration Advisory Circular, 150/5190-4A, "A Model Zoning Ordinance to Limit Height of Objects Around Airports"