



## Chapter 8 – ALTERNATIVES OF AIRPORT DEVELOPMENT

### 8.01 GENERAL

This chapter deals with the description and evaluation of alternative plans for proposed development at the Dutchess County Airport. The purpose of this analysis is to develop a complement of airport facilities that can realistically accommodate the demands imposed upon it. The master planning process is one of defining the facility requirements of the airport to handle the forecast demand. After facility requirements have been determined, a series of alternative solutions to satisfy them must be identified and tested.

The alternative plans will undergo a comparative evaluation process consisting of qualitative and quantitative factors. Ideally, the evaluation process would express all factors involved in terms of a common quantitative measure, such as dollar value or number of homes impacted by sound. Because of the difficulties inherent in expressing certain factors in quantifiable terms, the evaluation process must rely on the use of both quantitative and qualitative factors.

The factors considered are grouped in five basic categories as follows:

- Airport Design Standards;
- Environmental Impacts;
- Development Costs;
- Facility Requirements; and
- Implementation Feasibility.

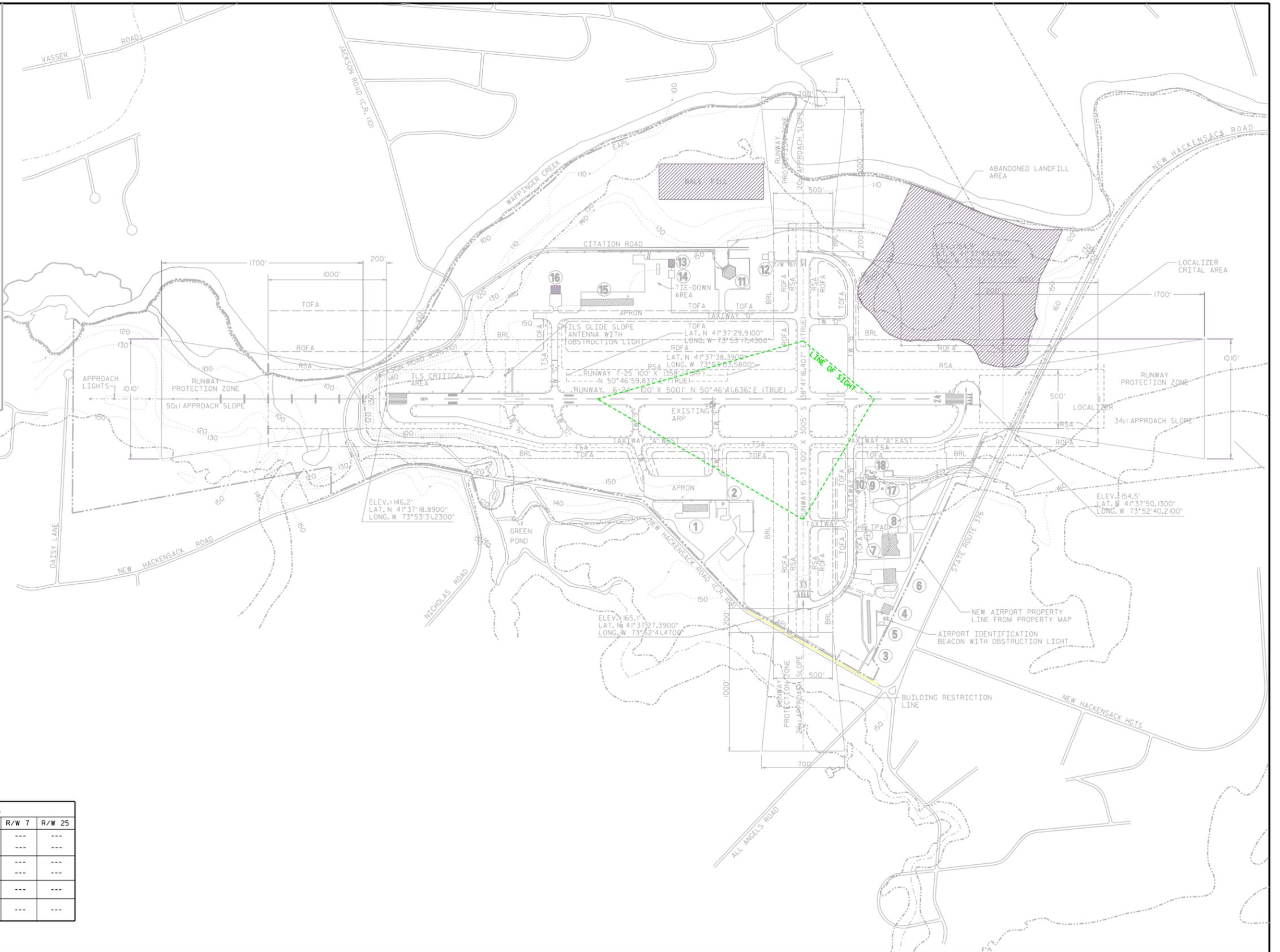
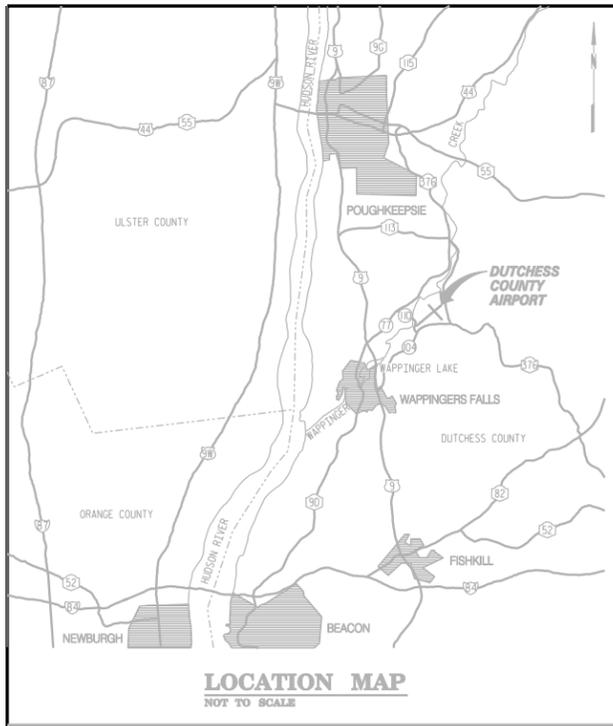
Three individual plans were prepared during the evaluation phase to depict future development alternatives. Although they do not exhaust all the variations that may be applied, the alternatives form an appropriate base to produce a "preferred" plan of development for the airport. In most cases, this preferred alternative will be a blend of projects taken from different alternatives, with the more favorable points of each selected for presentation on the Airport Layout Plan.

### 8.02 DESCRIPTION OF ALTERNATIVE PLANS

Three development options were selected for evaluation to assess the advantages and disadvantages of each. These options were developed as a result of meetings and discussions with the Technical Advisory Committee, the FAA, and the NYSDOT. This subsection describes the three plans of alternative development. It should be noted that this analysis focuses on options of both airside and landside development. The alternative plans are as follows:

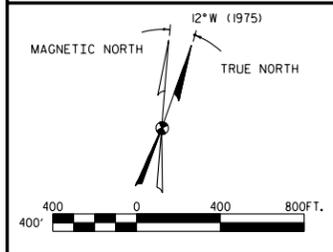
**Alternative 1 - No-Build:** This plan represents a scenario where the airport is not developed at all (*see* Figure 8-1).

**Alternative 2:** This alternative is depicted in Figure 8-2. It involves construction of a new 5,000 square foot General Aviation Welcome Center and Line Services Office. A major feature of this proposed alternative would necessitate the demolition of the current Pilot's Lounge, the removal of the Line Services Office Trailer, and the relocation of the fire pond. A new GA Welcome Center facility is proposed to provide sufficient upgraded office space for the airport Line Services personnel and an improved and expanded Pilot's Lounge space for local and business-related pilots



FACILITY	SIZE	DESCRIPTION
BLDG. 1	19,200 SF	TERMINAL/ADMIN./FBO OFFICES
BLDG. 2	2,500 SF	ACTC/FAA OFFICES
BLDG. 3	8,750 SF	T-HANGAR
BLDG. 4	6,050 SF	ARFF/MAINTENANCE
BLDG. 5	750 SF	COLD STORAGE BUILDING
BLDG. 6	33,400 SF	AAG CONVENTIONAL HANGAR
BLDG. 7	20,000 SF	AAG CONVENTIONAL HANGAR
BLDG. 8	1,500 SF	FUEL FARM
BLDG. 9	125 SF	LINE SERVICES OFFICES
BLDG. 10	625 SF	PILOT'S LOUNGE
BLDG. 11	9,600 SF	RICHMOR/CONV. HANGAR FBO-OFFICES
BLDG. 12	2,250 SF	CIVIL AIR PATROL HANGAR
BLDG. 13	3,300 SF	WHITEFIELD CONVENTIONAL HANGAR
BLDG. 14	3,300 SF	FRANK REISS CONVENTIONAL HANGAR
BLDG. 15	22,984 SF	T-HANGAR
FACILITY 16	6,800 SF	PRECISION AVIONICS/AERO MECHANICAL
FACILITY 17	---	ELECTRICAL VAULT
FACILITY 18	---	ABOVE GROUND FUEL STORAGE TANK

RUNWAY AND TAXIWAY SAFETY AREAS							
		R/W 6	R/W 24	R/W 15	R/W 33	R/W 7	R/W 25
RSA	WIDTH	426' (130m)	500' (152m)	150' (46m)	150' (46m)	---	---
	LENGTH	111' (34m)	300' (91m)	207' (63m)	300' (91m)	---	---
ROFA	WIDTH	800' (240m)	800' (240m)	250' (75m)	250' (75m)	---	---
	LENGTH	111' (34m)	300' (91m)	207' (63m)	300' (91m)	---	---
TSA	WIDTH	118' (36m)	118' (36m)	49' (15m)	49' (15m)	---	---
	LENGTH	---	---	---	---	---	---
TOFA	WIDTH	186' (57m)	186' (57m)	89' (27m)	89' (27m)	---	---
	LENGTH	---	---	---	---	---	---



LEGEND		REVISIONS		
EXISTING BUILDING		BY	DATE	CHANGE
FUTURE BUILDING				
PROPERTY LINE				
EXISTING AIRPORT PROPERTY LINE				
FUTURE AIRPORT PROPERTY LINE				
RUNWAY OBJECT FREE AREA				
CONTOUR LINE				
BUILDING RESTRICTION LINE				
100 YEAR FLOOD PLAIN BOUNDARY				

FIGURE 8-1  
**DUTCHESS COUNTY AIRPORT**  
 WAPPINGERS FALLS, NEW YORK DUTCHESS COUNTY

**ALTERNATIVE 1 - NO BUILD**

DESIGNED: MAH      DRAWN: LB  
 CHECKED: MAH      DATE: SEPTEMBER 2000      SHEET 1 OF 1

PROJECT FILE NO. I28.019.001      CADD FILE NO.: I637AP06

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## Dutchess County Airport Master Plan Update

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through the planning period. Other elements of this alternative include construction of approximately 105,000 square yards of paved aircraft apron including access taxiways, roadways, and GA auto parking to meet future airport demand.

The airport currently suffers from a critical shortage of aircraft hangar space. To meet existing and future demand, Alternative 2 proposes the construction of ten corporate conventional hangars (72,250 SF), three 20-Bay nested T-hangars, one 10-Bay nested T-hangars, and one 10-Bay ranch hanger totaling approximately 102,580 square feet. All bays are proposed to have paved access. The relocation of existing GA tie-down area (north of Runway 6-24) to a new paved apron in the southeast quadrant of the airport is proposed in order to maximize the old aircraft parking area for corporate hangar development.

Invariable elements of the alternative include corrections for potential RSA encroachments on Runways 6-24 where practical to improve. Additionally, implementation of an Engineered Materials Arresting System (EMAS) is proposed off the Runway 24 end to enhance safety of aircraft landings and departures. Alternative 2 proposes oil/water separators be installed in the present ARFF building and a membrane roof replacement on the existing T-hangar located in the southeast quadrant of the airfield. An additional element of this alternative includes an expansion of the Cold Storage Pole Barn to accommodate storage of maintenance equipment.

**Alternative 3:** Figure 8-3 graphically depicts this alternative including many of the same proposed components from Alternative 2 with minor differences. A major feature of this alternative proposes the replacement of the existing T-hangar in the southeast quadrant of the airport with two 10-Bay nested T-hangars in **Option A** (25,380 SF). In **Option B**, the alternative proposes the replacement of the T-Hangar with two 20-bay nested T-hangars (approximately 47,600 SF). Additionally, this alternative includes an expansion (doubling the current space on-site) rather than demolition of the existing Pilot's Lounge facility in order to create a new GA Welcome Center and Line Services Office. Alternative 3 proposes to remove the existing Line Services Trailer and relocate the fire pond in order to maximize the land area for paved GA and transient aircraft parking apron with a reconfigured GA automobile parking lot.

As previously stated in the description of proposed improvements in Alternative 2, Dutchess County Airport currently does not provide sufficient aircraft hangar storage space. To meet existing and future demand, Alternative 3 **Option A** proposes the construction of eight corporate conventional hangars (57,800 SF), two 20-Bay nested T-hangars, four 10-Bay nested T-hangars, and one 10-Bay ranch hanger (approximately 117,000 SF). Alternative 3 **Option B** proposes the construction of eight corporate conventional hangars (57,800 SF), four 20-Bay nested T-hangars, two 10-Bay nested T-hangars and one 10-bay ranch hanger (approximately 140,000 SF). All bays are proposed to have paved access. Relocation of the present GA tie-down area (north of Runway 6-24) is also proposed in this alternative configuration to a new paved aircraft apron area near the existing and proposed newly expanded Pilot's Lounge/Line Services (GA Welcome Center).

Additional alternative components include construction of approximately 134,000 square yards of paved aircraft parking apron, hangar access areas, expanded terminal apron for transient aircraft, one taxiway extension, a stub taxiway off Runway 33 end and a new taxiway off Runway 33 end to facilitate apron and runway access. Alternative 3 also proposes to construct associated GA auto parking areas for access to corporate and T-hangar facilities.



## Dutchess County Airport Master Plan Update

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Invariable elements of the alternative include corrections for potential RSA encroachments on Runways 6-24 where practical to improve. Additionally, implementation of an EMAS is proposed off the Runway 24 end to enhance safety of aircraft landings and departures. As proposed in Alternative 2, oil/water separators are proposed for installation in the present ARFF building. An additional element of this alternative includes an expansion of the Cold Storage Pole Barn to accommodate storage of maintenance equipment.

### 8.03 EVALUATION CRITERIA

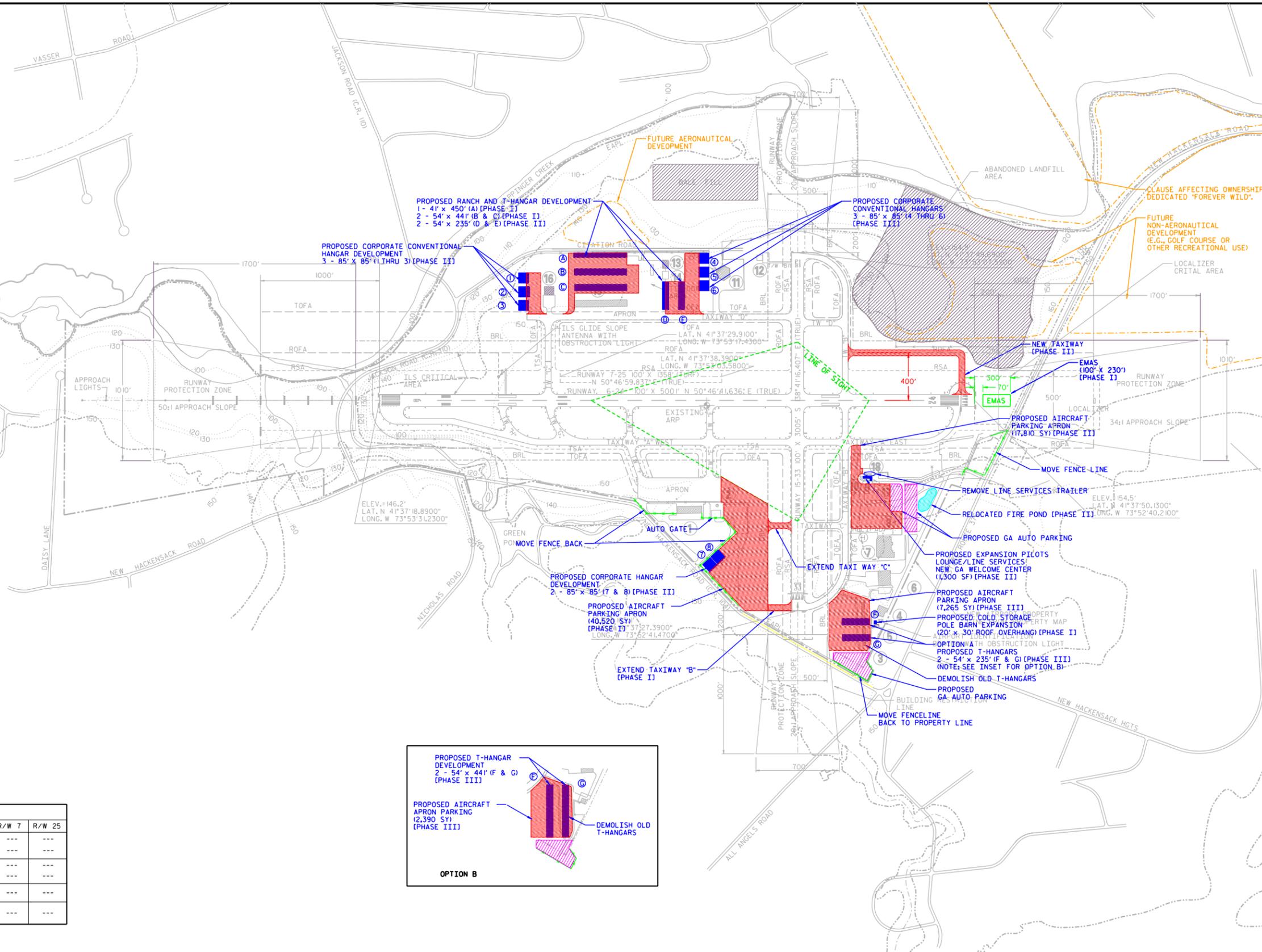
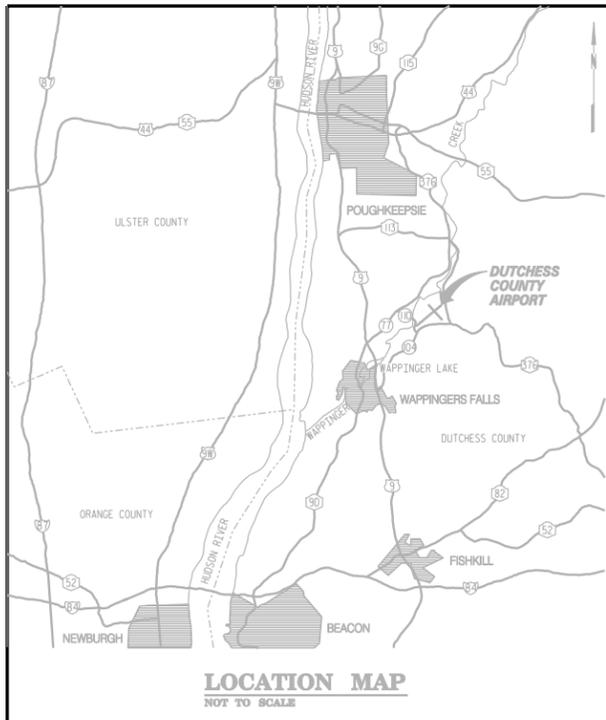
Evaluation criteria were developed to determine which of the airside and landside development alternatives would best meet Dutchess County Airport's requirements for the year 2020. These criteria are discussed in the following sections.

#### 8.03-1 AIRPORT DESIGN STANDARDS

First, the alternatives were rated on their ability to meet the FAA airport design standards (shown in Table 8-1) and to continue to provide for safe operation of aircraft at the airport. These standards are design criteria involving widths, gradients, separations of runways, taxiways, and other features of the landing area that must necessarily incorporate wide variations in aircraft performance, pilot technique, and weather conditions. The FAA design standards provide for uniformity of airport facilities and serve as a guide to aircraft manufacturers and operators with regard to the facilities that may be expected to be available in the future. Examples of improvements based on airport design standards would include the removal of an obstruction to air navigation, the grading of a runway safety area, or the addition of a parallel taxiway (to improve the aircraft traffic flow, limiting the time an aircraft must spend on the runway, both before takeoff and after landing).

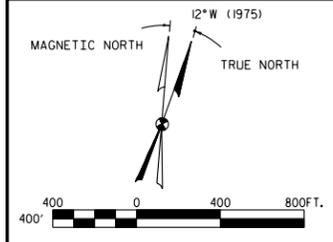
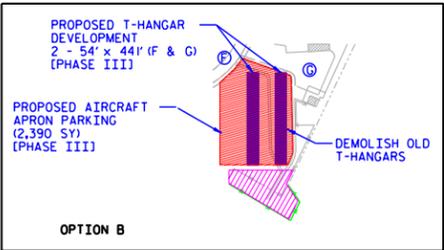
The alternative plans for Dutchess County Airport are based on design standards, contained in FAA AC 150/5300-13, for an Airport Reference Code D-II airport. (Aircraft Approach Category D includes aircraft with a speed of 141 knots or more but less than 166 knots. Airplane Design Group II includes airplanes with a wingspan up to but not including 79 feet.) The major design standards used are shown in Table 8-1. The dimensions for the runway protection zones and approach surfaces are shown in Figure 8-4.





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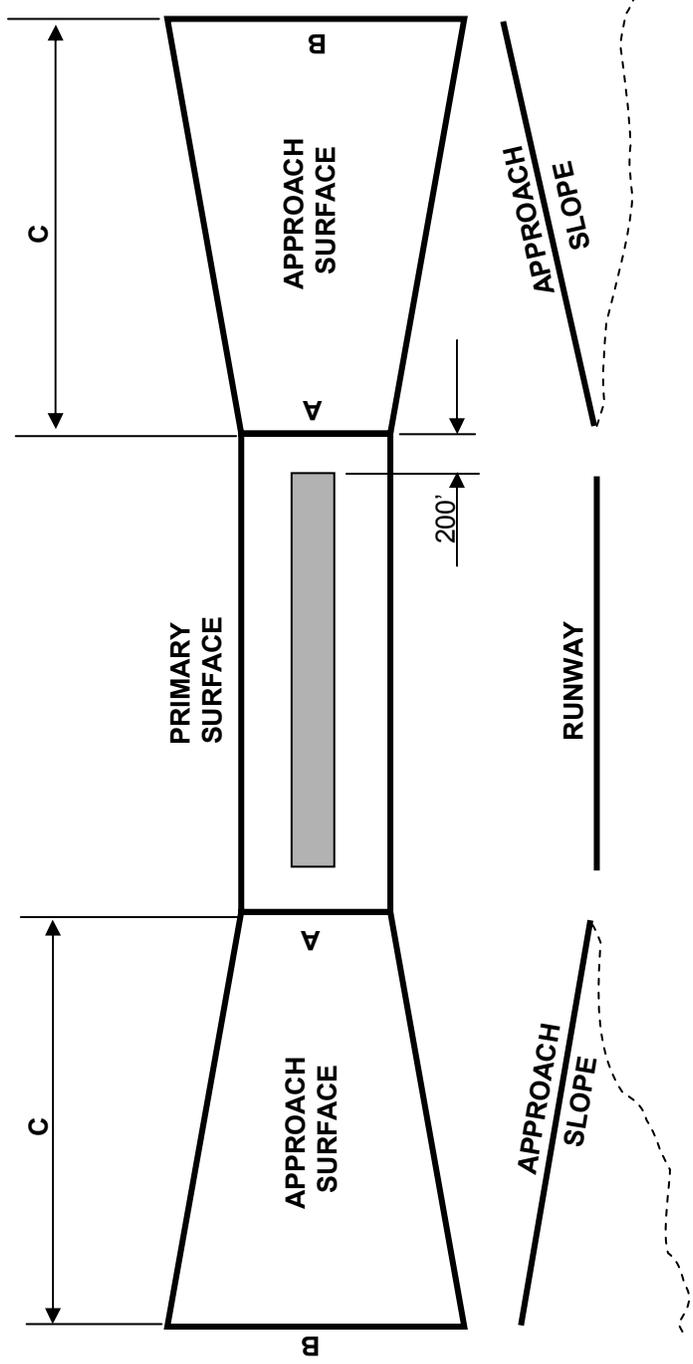
LEGEND		REVISIONS		
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FUTURE AIRPORT PROPERTY LINE				
RUNWAY OBJECT FREE AREA				
CONTOUR LINE				
BUILDING RESTRICTION LINE				
100 YEAR FLOOD PLAIN BOUNDARY				

FIGURE 8-3  
**DUTCHESS COUNTY AIRPORT**  
 WAPPINGERS FALLS, NEW YORK DUTCHESS COUNTY

**ALTERNATIVE 3**

DESIGNED: MAH	DRAWN: LB	SHEET <b>1</b> OF <b>1</b>
CHECKED: MAH	DATE: SEPTEMBER 2000	
PROJECT FILE NO. I28.019.001	CADD FILE NO.: I637A06	

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RUNWAY END	DIMENSIONS (FT.)			
	APPROACH	A	B	C
6	P	1,000	16,000	10,000 + 40,000
24	NP	1,000	3,500	10,000
15	VISUAL	500	1,500	5,000
33	VISUAL	500	1,500	5,000

NP = NON PRECISION INSTRUMENT APPROACH  
 P = PRECISION INSTRUMENT APPROACH  
 RPZ = RUNWAY PROTECTION ZONE

SOURCE: FAA ADVISORY CIRCULAR  
 150/5300-13 & FAR PART 77, OBJECTS AFFECTING  
 NAVIGABLE AIRSPACE

**FIGURE 8-4 - Approach Surface Dimensions**

ENGINEERS  
 DESIGN BUILD  
 TECHNICAL RESOURCES  
 OPERATIONS



DUTCHESS COUNTY AIRPORT  
 MASTER PLAN UPDATE



**TABLE 8-1**  
Design Standards

Item	Runway 6-24 Existing Conditions	Recommended Dimension or Standard	Runway 15-33 Existing Conditions	Recommended Dimension or Standard
Runway Centerline to				
-Parallel Taxiway Centerline	350'	300'	400'	225'
-Aircraft Parking Area	450'	400'	300'	200'
Runway Width	100'	100'	100'	60'
Runway Safety Area				
-Width	<b>426'</b> (RWY 6) 500' (RWY 24)	500'	150' (RWY 15) 150' (RWY 33)	120'
-Length (beyond runway end)	<b>111'</b> (RWY 6) <b>300'</b> (RWY 24)	1000'	<b>207'</b> (RWY 15) 300' (RWY 33)	240'
Runway Object Free Area				
-Width	800' (RWY 6) 800' (RWY 24)	800'	250' (RWY 15) 250' (RWY 33)	250'
-Length (beyond runway end)	<b>111'</b> (RWY 6) <b>300'</b> (RWY 24)	1000'	<b>207'</b> (RWY 15) 300' (RWY 33)	240'
Taxiway Width	50'	35'	50'	25'
Taxiway Safety Area Width	118'	79'	49'	49'
Other Considerations:				
Helicopter Touchdown Pad	1,150'	500'	500'	500'

Note: Bold dimensions do not meet the recommended design standards.

SOURCE: Tables in Advisory Circular 150/5300-13, 150/5390-2A and C&S Engineers, Inc.

### 8.03-2 ENVIRONMENTAL IMPACTS

This criterion was used to rate alternatives on how they would affect the airport environment and the airport community. An environmental study of the possible impacts associated with the alternatives was undertaken as part of the rating process. (Chapter 7 includes an environmental study of the airport). The alternative development rating includes assessing how the environment could be affected by the proposed development, and to what degree (e.g., acres of wetland impacts).

### 8.03-3 DEVELOPMENT COSTS

This criterion was used to rate each of the alternatives based on probable development cost.

### 8.03-4 FACILITY REQUIREMENTS

This criterion was used to rate alternatives based on ability to satisfy the facility requirements identified in Chapter 6. Facility requirements are developed from an analysis of the demand and capacity requirements, and from geometric and other standards governing the design of airport components. Specific projects required to meet existing and future demand at the airport include:



- Aircraft Parking Apron
- Runway and Taxiway Rehabilitation
- Aircraft Storage Hangars
- GA Pilots Lounge / Line Service Quarters Rehabilitation
- Terminal Area Improvements, and
- Auto Parking.

### 8.03-5 IMPLEMENTATION FEASIBILITY

This criterion answers the question: What is the likelihood that this alternative will be implemented? The preferred development alternative must have the ability to be implemented through logical phases that meet the airport's increasing requirements to the year 2020. Therefore, each alternative was rated on its feasibility for implementation, considering both quantitative and qualitative factors. These include factors such as the urgency of the need to address deficiencies and safety concerns, the degree of environmental impacts, community receptiveness, feasibility of needed land acquisition, and the county's willingness to bear the development cost (along with the FAA and NYSDOT).

## 8.04 EVALUATION OF ALTERNATIVES

Each alternative was evaluated based on the five criteria discussed previously: airport design standards, environmental impacts, development costs, facility requirements, and implementation feasibility. The evaluation matrix (Table 7-4) uses a scale of 1 to 5 ("1" being poor and "5" being excellent) to rate each alternative for its ability to satisfy each criterion. The alternative ratings are then totaled. This system allows each alternative to be judged overall and on each individual criterion. By totaling individual ratings for each of the evaluation criteria, the alternatives can be ranked in order of preference. The following sections provide a discussion of the evaluation of the alternatives based on the specified criteria.

### 8.04-1 AIRPORT DESIGN STANDARDS

**Alternative 1:** This alternative receives a rating of 3 for airport design standards. With the exception of the limited available RSA off all runway ends, the existing airport meets or exceeds FAA recommended design standards. Therefore, all RSAs would be non-standard except off the Runway 33 end. The runway to taxiway separation distance is not standard between Runway 6 end and Taxiway "H" because of steep slopes.

**Alternatives 2 and 3:** Both alternatives will meet FAA design standards with the exception of the limited available RSA off all runway ends (except the Runway 33 end). The runway to taxiway separation distance is not standard between Runway 6 end and Taxiway "H" because of steep slopes. The FAA "requires" compliant RSA standards to the extent possible and recommends that ROFAs and RPZs be cleared and/or under airport owner control through acquisition or sufficient property interest. Relocating the fence line out of the RSA is proposed at the Runway 24 end to provide 200 feet of outbound RSA length. Additionally, implementation of an EMAS is proposed off the Runway 24 end to enhance safety of aircraft landings and departures. The RSA off the Runway 33 end currently meets FAA design standards. The remaining RSAs do not appear practical to improve short of relocating major roadway alignments and grading steep drop-offs according to a *Runway Safety Area Evaluation* conducted by the NYSDOT (October 1999). Therefore, all remaining RSAs



would be non-standard. The runway to taxiway separation distance between Runway 6 end and Taxiway "H" is also not practical to improve because of steep slopes.

The use of declared distances for airport runway design is normally limited to cases of existing constrained airports where it is impractical to provide the runway safety areas, runway object free areas, or the runway protection zones in accordance with the design standards provided in FAA AC 150/5300-13. In September of 2000, the FAA issued a Runway Safety Area Determination which considered various alternatives to provide a standard RSA on Runway 6-24. Because relocation of State Route 376, County Road No. 110 and Wappinger Creek are considered to be environmentally problematic if not infeasible, consideration was then directed at runway adjustment alternatives. Relocating the airport fence line outside of the RSA on the Runway 24 end would provide 200 feet of RSA and this measure is proposed in both Alternatives 2 and 3. However, it was also proposed by the FAA to apply declared distances to provide at least a partial RSA on each runway end by using declared distances.

To provide 500 foot RSA's on each end, the Runway 6 threshold is proposed to be displaced 500 feet, and the Runway 24 threshold is proposed to be displaced 300 feet (assuming that 200 feet outboard from the runway can be achieved by relocating the fence line). This would result in 5001-feet of both Take off Runway Available and Take off Distance Available for both runway ends. However, the accelerated stop distance for the Runway 6 end would be reduced to 4,701 feet and the landing distance available would be reduced to 4,201 feet. Additionally, for the Runway 24 end, the accelerated stop distance would be reduced to 4,501 feet and the landing distance available would be reduced to 4,201.

Since Runway 24 is designated the primary runway in an effort to reduce noise exposure over residential land areas located off the Runway 6 end, it would indeed be prudent to utilize declared distances in lieu of the proposed EMAS off the Runway 24 end. Additionally, since Runway 6 is determined by the FAA as near infeasible to improve, it would also be considered prudent to displace the threshold on the Runway 6 end as is recommended by the FAA. However, the reduction in runway length would severely impact the airport's ability to remain competitive with other surrounding general aviation airports where there is a demand for corporate aircraft storage space.

Therefore, it is recommended that the airport petition the FAA to revisit the runway safety area determination within the context of the newly proposed incremental RSA improvements proposed under the alternatives, specifically those measures (such as the fence relocation and the addition of an EMAS off the Runway 24 end) proposed under the preferred alternative. These measures would effectively assist the airport in continuing and maintaining its competitive edge by retaining its current runway length as well as provide incremental improvements to runway safety at the airport.

The implementation of declared distances will require prior FAA coordination and approval, which is granted on a case-by-case basis. Alternative 2 and 3 receive a rating of 3 for this criterion since they meet or exceed most FAA design standards.



## 8.04-2 ENVIRONMENTAL IMPACTS

The potential environmental impacts that are addressed for each alternative are listed below:

Noise	Coastal Barriers
Compatible Land Use	Coastal Zone Management
Social Impacts	Wild & Scenic Rivers
Induced Socioeconomic Impacts	Prime & Unique Farmland
Air Quality	Energy Supply & Natural Resources
Water Quality	Light Emissions
DOT, Section 4(f)	Solid Waste
Historic, Architectural, Archeological & Cultural Resources	Construction Impacts
Biotic Communities	Environmental Justice
Endangered & Threatened Species	Impacts to Children
Wetlands	Direct, Indirect, and Cumulative Impacts
Flood Plains	Anticipated Permits and Approvals

The alternatives are analyzed for their impact in each of the 24 categories. (For full environmental study, *see* Chapter 7). Specific impacts for each alternative are discussed below:

### Alternative 1:

There are no impacts to the environment since no airport development would occur.

### Alternative 2:

- 1) **Historic, Architectural, Archeological, and Cultural Resources** - Correspondence with New York State Office of Parks, Recreation and Historic Preservation recommends that a Phase I survey is warranted unless substantial ground disturbance can be documented. Dutchess County Soil and Water Conservation District identifies all proposed airport development areas as "Cut and Fill" soil zones, indicating ground disturbance that can be documented. Furthermore, there may be properties on or in the vicinity of the airport property that are eligible for listing on the State and National Registers. The SHPO recommends that a survey of historic resources be undertaken of all properties over 50 years old on the airport property or in an area likely to be impacted by airport development.
- 2) **Water Quality** – There would be a potential increase in stormwater runoff from newly constructed aircraft parking apron pavement. However, additional stormwater runoff will be directed to the existing drainage system and appropriate storm water management practices should be implemented.
- 3) **Construction** - There would be short-term construction impacts (air quality, water quality) due to earth movement, equipment noise, and some soil erosion.

### Alternative 3:

- 1) **Historic, Architectural, Archeological, and Cultural Resources** - As noted for Alternative 2, documentation of substantial ground disturbance would be needed for planned development. Furthermore, there may be properties on or in the vicinity of the airport property that are eligible for listing on the State and National Registers. The SHPO recommends that a survey of historic resources be undertaken of all



## Dutchess County Airport

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- properties over 50 years old on the airport property or in an area likely to be impacted by airport development.
- 2) **Water Quality** – There would be a potential increase in stormwater runoff from newly constructed aircraft parking apron pavement. However, additional stormwater runoff will be tied into the existing drainage system and appropriate storm water management practices should be implemented.
  - 3) **Construction** - There would be short-term construction impacts (air quality, water quality) due to earth movement, equipment noise, and some soil erosion.

Significant land use compatibility or noise impacts are not anticipated for any of the three alternatives since changes in fleet mix and numbers of aircraft operations are projected to be moderate. The percentage of nighttime operations (reported by the air traffic control tower) is adjusted downward to generate future noise contours. The future noise exposure contours are shown on Figure 7-2, *Future Noise Contours*. There are residential incompatible uses within the existing DNL 65 dB, which is the generally accepted level for determining the onset of significant impacts. Likewise, the number of residences adversely impacted by future noise is not likely to appreciably surpass the existing conditions under the proposed alternatives. (See Appendix D for the noise exposure analysis).

Based on the above analysis, Alternative 1 received a rating of 5 since this no-build alternative will have no adverse environmental impacts. Alternative 2 is rated 4 since only short-term impacts are anticipated. Alternative 3 received a rating of 3 because it involves more aircraft parking apron construction.

### 8.04-3 DEVELOPMENT COSTS

Current unit project costs for major airside and landside development work were prepared. This consisted of reviewing recent bids of contracts awarded in New York under the FAA AIP and preparation of an opinion of probable costs based upon the consultant's knowledge of contractors and construction material suppliers. The major work items selected for this purpose are presented in Table 8-2 with associated probable unit costs.

The objective of quantifying unit project costs was to obtain an approximate cost of each alternative plan. In order to accomplish this in a practical manner, major cost items associated with airside and landside improvements were included in the computations. The construction costs shown for each plan are not to be considered the final total cost of each plan, but are meant to provide a means of comparison.



**TABLE 8-2**  
Unit Costs for Airport Development

Item	Unit	Unit Cost
<b>Airside Facilities</b>		
Taxiway Construction	Square Yard	\$125 <sup>1</sup>
Taxiway Lighting, Signs & Homerun	Linear Foot	\$180
Taxiway Pavement Markings	Square Foot	\$4
<b>Landside Facilities</b>		
Apron Construction	Square Yard	\$125 <sup>2</sup>
Conventional Hangar	Square Foot	\$110
T-Hangar	Per Bay	\$52,000 <sup>3</sup>
Auto Parking Construction	Square Yard	\$125 <sup>4</sup>
Perimeter Security Fencing	Linear Foot	\$46
Building/Hangar Demolition	Square Foot	\$10
GA Welcome Center	Square Foot	\$150
Relocation of the Fire Pond	Lump Sum	\$250,000
Oil and Water Separators <sup>5</sup>	Lump Sum	\$30,000
Membrane Roof Replacement	Lump Sum	\$170,000
Cold Storage Expanded Roof Overhang	Lump Sum	\$50,000 <sup>3</sup>
AvGas 15,000 Gallon Tank	Lump Sum	\$150,000
Engineered Materials Arresting System (EMAS)	Lump Sum	\$2,600,000

<sup>1</sup>(includes all costs for pavement, drainage, and grading except electrical)

<sup>2</sup>(with tie downs & markings)

<sup>3</sup>(includes floor pavement)

<sup>4</sup>(with lighting)

<sup>5</sup>This is the cost to install a 3,000-gallon underground tank to store runoff from floor drains. This option has a dramatically lower cost versus an on site treatment system. In addition, due to the intermittent nature and volume of the discharge, the treatment system would require the installation of a storage tank to efficiently operate the treatment system. See the Best Management Practice Plan (2000) recommendations for the Dutchess County Airport with regard to preventing or minimizing the potential for release of significant amounts of pollutants to the waters of the State of New York.

Note: All estimates include 20% Engineering and Construction Inspection

SOURCE: C&S Engineers, Inc.

Table 8-3 presents a comparison of the costs associated with each of the alternatives. There is no cost associated with the no-build Alternative 1; thus, it receives a rating of 5. Alternative 2 costs approximately \$3.7 million more than Alternative 3 under **Option A** due to more corporate hangar development and the construction of a new GA Welcome Center. **Option B** under Alternative 3 offers additional aircraft parking apron, less corporate hangar construction, and the expansion of the existing Pilot's Lounge. Alternative 2 costs approximately \$1.6 million more than Alternative 3 under **Option B**. Thus Alternative 2 receives a rating of 3 and Alternative 3 received a rating of 4.



**TABLE 8-3**  
**Opinion of Probable Development Costs**  
 (2002 Dollars)

<b>ALTERNATIVES</b>		<b>1</b>	<b>2</b>	<b>3</b>
<b>Item</b>				
<b><i>Airside Facilities</i></b>				
Taxiway Construction	\$0	\$1,084,375	\$1,240,625	
Taxiway Lighting, Signs & Homerun	\$0	\$643,500	\$747,000	
Taxiway Pavement Markings	\$0	\$34,700	\$39,700	
<b><i>Landside Facilities</i></b>				
Apron Construction	\$0	\$7,139,375	\$8,199,375 <sup>1</sup>	\$7,590,000 <sup>2</sup>
Conventional Hangar	\$0	\$11,283,800	\$6,358,000	
T-Hangar	\$0	\$4,160,000	\$4,680,000 <sup>1</sup>	\$5,720,000 <sup>2</sup>
Auto Parking Construction	\$0	\$1,528,750	\$1,510,625	
Perimeter Security Fencing	\$0	\$250,000	\$250,000	
Building/Hangar Demolition	\$0	\$7,500	\$88,750	
GA Welcome Center	\$0	\$750,000	\$195,000	
Relocation of Fire Pond	\$0	\$250,000	\$250,000	
Oil and Water Separators	\$0	\$30,000	\$30,000	
Membrane Roof Replacement	\$0	\$170,000	---	
Cold Storage Expanded Roof Overhang	\$0	\$50,000	\$50,000	
Avgas 15,000 Gallon Tank	<b>\$0</b>	<b>\$150,000</b>	<b>\$150,000</b>	
Engineered Materials Arresting System (EMAS)	<b>\$0</b>	<b>\$2,600,000</b>	<b>\$2,600,000</b>	
<b>TOTAL</b>	<b>\$0</b>	<b>\$30,132,000</b>	<b>\$26,289,075</b>	<b>\$28,527,065</b>

<sup>1</sup> Hangar Configuration under Option A.

<sup>2</sup> Hangar Configuration under Option B.

SOURCE: C&S Engineers, Inc.

### 8.04-4 FACILITY REQUIREMENTS

#### Alternative 1:

This alternative would not meet the airport's immediate and long-term requirements. This alternative does not address the existing deficiencies of the landside facilities, the inefficiency of the airfield and airside facilities such as the seriously substandard and inadequate Pilots Lounge/Line Services quarters.

#### Alternative 2:

This alternative meets all of the airport's immediate and long-term facility requirements (as listed in Section 8.03-4). It would correct existing deficiencies and allow for future development. The benefits of Alternative 2 are that it offers more corporate conventional hangars than Alternative 3. Considering the current conditions regarding national commercial air service, this alternative may warrant serious consideration due to an increase in demand for privately owned or franchised corporate aircraft. This in turn may provide justification for better, more efficient line services and a larger pilot lounge with amenities.



The stub extension off the Runway 13 end will provide efficient taxiing to and from the proposed expanded terminal apron. The addition of a new taxiway north of the Runway 24 end will provide access to Runway 24 that is more efficient. It will connect the GA area to Runway 24 in order for pilots to avoid utilizing the runway en route.

### **Alternative 3:**

This alternative would meet all of the airports immediate and long-term facility requirements (as listed in Section 8.03-4) and also would correct existing deficiencies and allow for future development. This alternative; however, offers less in corporate hangar development, but slightly greater aircraft-parking apron area. It also offers some additional T-Hangar space in contrast to Alternative 2, especially under *Option B*. Finally, Alternative 3 offers more taxiway efficiency for the movement of aircraft to and from parking areas without the interruption of runway maneuvers.

The proposed new taxiway from Taxiway "B" to Runway 24 and the proposed extended stub off Runway 33 is also a component of this alternative providing the same benefits as those mentioned in Alternative 2. However, an additional benefit with regard to the maximum efficiency of the taxiway system is the proposed extension of Taxiway "C" to the proposed expanded terminal apron.

The current length of Runways 6-24 and 15-33 is expected to be adequate for the 20-year planning period. Based on the facility requirements criterion, Alternative 1 was rated 1, Alternative 2 was rated 5, and Alternative 3 was rated 4.

### **8.04-5 IMPLEMENTATION FEASIBILITY**

The last evaluation criterion was the implementation feasibility of the alternatives. Considering both quantitative and qualitative factors, this criterion answers the question: What is the likelihood that this alternative will be implemented?

### **Alternative 1:**

Alternative 1 receives a rating of 2 because, although no implementation would be involved, taking no action would allow existing deficiencies and violations of FAA safety standards shown in Table 8-1 to go uncorrected.

### **Alternative 2:**

The environmental impacts associated with Alternative 2 would be less than Alternative 3 because it proposes less apron area than Alternative 3. The cost of construction for Alternative 2 would be approximately 14% more than Alternative 3 under *Option A* and 5.7% more under *Option B*. The additional cost is attributed to the proposed construction of a new GA Welcome Facility with more corporate conventional hangar development. However, Alternative 2 may warrant serious consideration due to the potential increase in demand for privately owned or franchised corporate aircraft under the current conditions regarding national commercial air service. Alternative 2 would require the relocation of the Fire Pond to create a maximum area for aircraft parking apron.

The RSA on Runway 6 end is diagonally traversed by Jackson Road (C.R. 110) that ranges from a distance of 200 to 300 feet from the runway end. Along the runway centerline, a



## Dutchess County Airport

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steep drop off exists in the terrain beginning at 111 feet from the threshold and continues a downward slope until reaching Jackson Road. On the Runway 24 end, the blast fence lies on the extended runway centerline 300 feet from the runway end. Beyond this blast fence, NYS Route 376 and the airport property fence crosses the RSA. The airport property fence digresses away from NYS Route 376 at one side of the RSA and continues toward the corner of the RSA toward the runway threshold.

On the Runway 15 end, there is a drop off of terrain beginning 207 feet from the runway end. At the Runway 33 end, New Hackensack Road (C.R. 104) transverses the RSA at a distance of 220 feet from the end of the runway.

Relocating the fence line out of the RSA is proposed at the Runway 24 end to provide 200 feet of outbound RSA length. Additionally, an EMAS incorporated off the Runway 24 end will enhance safety of aircraft landings and departures. The remaining RSAs do not appear practical to improve short of relocating major roadway alignments and grading steep drop-offs according to a Runway Safety Area Evaluation conducted by the NYSDOT (October 1999). Therefore, this alternative would contain non-standard RSAs off Runways 6, 24, and 33. An FAA determination regarding what to do with non-standard RSA would need to be prepared under the FAA 's new policy. Therefore, feasibility of implementation was rated 3 for Alternative 2.

### **Alternative 3:**

There may be more of an environmental impact associated with the construction of aircraft parking apron over Alternative 2 although Alternative 2 requires more hangar development than Alternative 3. Again however, Alternative 2 may warrant more serious consideration due to the potential increase in demand for privately owned or franchised corporate aircraft under the current conditions regarding national commercial air service. Additionally, Alternative 3 proposes an expansion of the existing Line Services/Pilots Lounge rather than reconstruction. Both alternatives; however, require the relocation of the Fire Pond for apron development. The cost projected for Alternative 3 is approximately \$3.7 million less than that for Alternative 2 under Option A and \$1.6 million less under Option B.

The RSA standards and implementation feasibility is the same as Alternative 2. Relocating the fence line out of the RSA is proposed at the Runway 24 end to provide 200 feet of outbound RSA length. Additionally, an EMAS incorporated off the Runway 24 end will enhance safety of aircraft landings and departures. The remaining RSAs do not appear practical to improve short of relocating major roadway alignments and grading steep drop-offs according to a Runway Safety Area Evaluation conducted by the NYSDOT (October 1999). Therefore, this alternative would contain non-standard RSAs off Runways 6, 24, and 33. A FAA determination regarding what to do with non-standard RSA would need to be prepared under the FAA's new policy. Therefore, Alternative 3 receives a rating of 4 for feasibility of implementation.

### **8.04-6 EVALUATION SUMMARY**

The evaluation of the three alternatives is summarized in Table 8-4. After totaling the individual ratings, the alternatives are ranked in order of preference.



**TABLE 8-4**  
**Alternative Ratings**

<b>Evaluation Criteria</b>	<b>Alternatives</b>		
	<b>1</b>	<b>2</b>	<b>3</b>
Airport Design Standards	3	3	3
Environmental Impacts	5	4	3
Development Costs	5	3	4
Facility Requirements	1	5	4
Implementation Feasibility	2	4	4
<b>TOTAL</b>	16	19	18
<b>RANK</b>	<b>3</b>	<b>1</b>	<b>2</b>

SOURCE: C&S Engineers, Inc.

Of the three alternatives, Alternative 1 received the lowest ratings overall based on the five evaluation criteria. Alternative 1 does not meet the facility requirements, nor does it address the existing deficiencies at the airport in relation to FAA safety standards.

Alternative 2 meets all facility requirements and most FAA design standards. It also enhances the safety and efficiency of the airport. Alternative 2 has the potential to meet the potential increase in demand for corporate hangars in the Greater Metropolitan/NYC downstate New York than Alternative 3. Additionally, Alternative 2 has potentially fewer effects on the environment because of less aircraft parking apron/impervious surfaces. However, the construction of a new GA Welcome Center in contrast to expanding the existing facility and a greater number of corporate conventional hangars adds cost over Alternative 3.

Alternative 3 meets most FAA airport design standards and all facility requirements, and enhances the safety and efficiency of the airport. The proposed airport development takes into consideration maximizing the functional design for airport efficiency and safety compared to Alternative 2 at a lower cost. For these reasons, Alternative 2 was rated higher overall than Alternative 3, and ranked first based on the five evaluation criteria.

**8.05 PREFERRED ALTERNATIVE**

Dutchess County Airport and the members of the Technical Advisory Committee were in accord with the following components taken from both Alternative 2 and Alternative 3 as the selected Preferred Alternative:

- The EMAS off Runway 24 end is to be included in the Preferred Alternative.
- The New Taxiway off Runway 24 end and connecting to Taxiway “D” is to be included in the Preferred Alternative.
- Taxiway stems off Runway 33 end extending Taxiway “C” and Taxiway “B” to the newly expanded apron adjacent the present terminal apron will be included in the preferred alternative.
- The relocation of the Fire Pond in order to maximize the area for GA auto parking, transient and based aircraft parking, business and corporate hangar development near the existing Pilot’s Lounge is to be included in the Preferred Alternative.
- It was recommended to construct a new GA Welcome Center as proposed under Alternative 2. The construction of a new GA Welcome Center is considered superior to expanding the existing



## Dutchess County Airport

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Pilot's Lounge because it provides maximum aircraft parking and taxiing efficiency for based, transient, and corporate aircraft, and the most proficiency for servicing General Aviation. Both the Phase I and Phase II Reports provided documentation that the existing Pilot's Lounge and Line Services office are critically substandard and inadequate with regard to its limited capacity and maintenance requirements (both structures are over 50 years old). It was recommended that a compelling justification for the construction of a new GA Welcome Center in comparison to expanding the existing Pilot's lounge should be included in the draft final report.

- The area north of Runway 6-24 near the existing T-hangar is proposed for additional T-hangar development. Three new T-hangars north of Runway 6-24 are retained from the previous Airport Master Plan Update are currently under construction.
- Any area north of Runway 6-24 off Taxiway "D" that is proposed for hangar development would be labeled "Reserved for Corporate/T-hangar Development" to give more flexibility and that those areas would be developed according to need and demand. Both alternative configurations for that area would be inserted as graphical representations for options in the Preferred Alternative.
- In the Preferred Alternative, (6) new corporate conventional hangars will be shown similar to those as presented in Alternative 2. Two are to be shown in the expanded terminal apron, three near the GA Welcome Center and one in the area off Taxiway "D" included with T-hangars.
- A new membrane roof replacement on the existing T-hangar in the Southeast Quadrant of the airport and the construction of a new 20-Bay Nested T-hangar as presented in Alternative 2 will be included in the Preferred Alternative.
- Install new 15,000 Avgas tank to accommodate peak demand over the planning horizon.