





## 7.2 AIRPORT LAYOUT PLAN DRAWING SET

The ALP Drawing Set has been prepared in accordance with generally accepted planning practices and with the following FAA guidance materials:

- FAA Advisory Circular 150/5300-13, *Airport Design*
- FAA Advisory Circular 150/5070-6B, *Airport Master Plans*
- Federal Aviation Regulations, Part 77, *Objects Affecting Navigable Airspace*
- FAA Eastern Region ALP Checklist

The ALP Drawing Set for the Greater Binghamton Airport consists of 12 drawing sheets as follows:

<u>Sheet</u>	<u>Title</u>
1.	Existing Airport Layout
2.	Airport Layout Plan
3.	Airport Data Sheet
4.	Airport Airspace Plan Sheet A
5.	Airport Airspace Plan Sheet B
6.	Inner Approach Surface and RPZ Control Plan: Existing Runway 16-34 Sheet A
7.	Inner Approach Surface and RPZ Control Plan: Existing Runway 16-34 Sheet B
8.	Inner Approach Surface and RPZ Control Plan: Existing Runway 10-28 Sheet A
9.	Inner Approach Surface and RPZ Control Plan: Existing Runway 10-28 Sheet B
10.	Obstruction Tables: Existing Runways
11.	Inner Approach Surface and RPZ Control Plan: Proposed Runway 16-34 Sheet A
12.	Inner Approach Surface and RPZ Control Plan: Proposed Runway 16-34 Sheet B
13.	Inner Approach Surface and RPZ Control Plan: Proposed Runway 10-28 Sheet A
14.	Inner Approach Surface and RPZ Control Plan: Proposed Runway 10-28 Sheet B
15.	Obstruction Tables: Proposed Runways
16.	Terminal Area Plan





- 17. Airport Land Use Plan
- 18. Airport Property Map

A reduced size copy of the ALP Drawing Set is provided at the end of this Master Plan Report. Narrative descriptions of the drawings are provided below.

### 7.3 EXISTING AIRPORT LAYOUT

The Existing Airport Layout (Sheet 1) illustrates the existing airport facilities at BRA. The drawing is based upon photogrammetric information collected from aerial photography taken in late 2006. The sheet shows the dimensions of the airside and landside facilities and applicable FAA safety areas.

The existing airport property boundaries are also depicted on the sheet. The airport property boundaries were determined using readily available data such as airport records and Broome County geographic information systems (GIS) data; however no “boundary survey” was specifically completed for this project.

The Existing Airport Layout Sheet also includes the Legend and a number of tables. The Airport Facilities table provides a key to airport buildings and use areas, the Declared Distances table indicates the takeoff and landing distances available on the runway system, and the Modification to Design Standards table documents the non-standard features that have been reviewed and authorized by FAA. Currently the only modification to design standards in effect is the 300 foot runway/taxiway separation between Runway 16-34 and Taxiway A. Finally, the Runway Safety Area Determination table documents the status of the airport’s safety areas.

### 7.4 AIRPORT LAYOUT PLAN

The ALP (Sheet 2) illustrates the recommended development at BRA over the 20-year planning period. The ALP sheet is the most important sheet in the Master Plan Drawing Set, as it is approved by the airport sponsor, NYSDOT and FAA. The ALP serves as the officially approved planning document for the airport. In order to be eligible for federal funding all future airport projects should be depicted on the ALP. Due to the extensive detail on Sheet 2, and to minimize clutter, a separate sheet (Sheet 3) was incorporated into the ALP Drawing Set to present the ALP tables. The major recommended airside and landside improvements depicted on the ALP (Sheet 2) are described in Sections 7.4.1 and 7.4.2 respectively. Sheet 3, *Airport Layout Plan Tables*, contains the All Weather and IFR Wind Roses, Airport Data Table, Runway Data Table, Modification to Design Standards Table and Declared Distances Table. The wind coverage under both All Weather and IFR conditions (for 16 knots) is excellent at over 99% for each. The Airport and Runway Data Tables show the existing and proposed (ultimate) conditions. Sheet 2 contains the Facilities Table,





Legend, and Signature Block.

### 7.4.1 Airside Improvements

The preferred airside alternative has been presented in Chapter 6, *Alternatives*. Modifications to additional airside elements, including lighting, instrumentation, and navigational aids, which were not included in the preferred taxiway or runway alternatives are incorporated into the ALP. The major airside development components are described in detail below. Land acquisition in fee simple or easement interest to provide full airport owner control over runway protection zones (RPZ) is also shown on the ALP and included in the discussion of airside improvements. All elements associated with the runway, including those items needed to assist in the safe and efficient takeoff or landing of an aircraft are included as airside improvements.

#### *Full parallel taxiway to Runway 10-28*

The ALP shows a full length parallel taxiway to Runway 10-28. This taxiway is composed of two existing sections of taxiway, Taxiway K at the Runway 10 end and Taxiway H at the Runway 28 end, plus a future connecting section to be constructed. Taxiways H and K were resurfaced in 2008/2009 so complete reconstruction of the existing sections may not be necessary. The new taxiway section would measure approximately 1,600 feet by 50 feet wide, consistent with the two existing sections. The project would include redesign of both the Taxiway K / Taxiway P / Taxiway F intersection as well as the Taxiway A / Taxiway F / Taxiway H intersection. Installation of medium intensity taxiway edge lights, pavement marking and signage would be included.

#### *Relocate Runway 16 MALSR and glideslope antenna*

As shown on the ALP, the displacement of the landing threshold on Runway 16 can be reduced from the current 401 feet to 200 feet, increasing the landing distance available on that runway from 6,699 feet to 6,900 feet. This would require relocation of the glideslope antenna to a new location approximately 200 feet up the runway toward the north, and modification of the approach light system. The MALSR is mounted on a horizontal truss that is suspended above the ground on towers, and the modifications would consist of shifting the all of the lights out 200 feet, and extending the support structure to support the outermost flashing light of the array. At this time it would also be advisable to shift the FAA electrical vault now located within the RSA to a new location outside the RSA.

#### *Replace EMAS and improve RSA at approach end of Runway 34*

This project will replace the 10-year old EMAS installation at the approach end of Runway 34 in compliance with current RSA criteria without incurring any loss of runway length. Both





EMAS and RSA standards have changed since the arresting bed was originally installed. Technological improvements have resulted in ‘Second Generation’ EMAS systems that can be specifically designed for the types of aircraft that use a runway, and the life cycle costs of the system have decreased. Additionally, new RSA standards require a 600-foot “undershoot” RSA on the approach end of the runway threshold have made the current installation on Runway 34 non-compliant. To bring this runway end into compliance, the EMAS bed will be shifted approximately 200 feet toward the south-southeast, providing the FAA standard 600 foot approach RSA between the existing threshold location and the far end of the EMAS. Because both the current and future EMAS installation is only 400 feet in length, the runway end can be relocated providing an extra 200 feet of pavement. This project will provide an additional 200 feet of takeoff distance on both Runways 16 and 34 and an additional 200 feet of landing distance on Runway 16, but the landing distance on Runway 34 would remain the same. The landing threshold, which remains in its current location, will be displaced 200 feet from the new runway end. This project will also permit the relocation of the offset localizer now serving the Runway 16 ILS to a standard location on the runway centerline extended. Although this could be accomplished as a separate project after the EMAS project is completed, it would be most efficiently done as part of a single project. This will result in the immediate conversion of the current offset Runway 16 ILS approach to a straight-in procedure, permitting a reduction of the decision altitude from a minimum of 250’ above threshold to a minimum of 200’, and permitting future improvement to CAT II or CAT III status. As proposed, the glideslope antenna would not be affected by this Runway Safety Area project, and the only anticipated impact to the approach light system would be the conversion of some lighting fixtures; at least one light unit now located on the EMAS bed would be converted to an in-pavement fixture. The new runway pavement would be equipped with High Intensity Runway Edge Lights (HIRL) and the extended Taxiway “A” and runway/taxiway connector would be equipped with MITL. The preliminary engineering layout of the embankment for the extension shows that the toe of slope would fall somewhere in the Commercial Drive roadway. The ALP shows a shifting of the roadway, but the need for, and the extent of roadway relocation, would be determined during the design process. As a result of the two Runway 16-34 projects, the declared distances would be as follows:

<b>Table 7.1: Runway 16-34 Declared Distances</b>				
	<b>Existing</b>		<b>Proposed</b>	
	<b>16</b>	<b>34</b>	<b>16</b>	<b>34</b>
<b>TORA</b>	7,100	7,100	7,300	7,300
<b>TODA</b>	7,100	7,100	7,300	7,300
<b>ASDA</b>	7,100	7,100	7,300	7,300
<b>LDA</b>	6,699	7,100	7,100	7,100





*Install centerline and TDZ lighting - Runway 16-34*

Runway centerline and touchdown zone lighting is installed in order to improve pilot recognition of the runway during poor visibility conditions. It is a required element for CAT II and CAT III approach procedures, which permit landing when horizontal visibility is less than ½ mile. It is also a factor in achieving lower takeoff minimums. At Binghamton, these lights have been recommended due to the frequency of bad winter weather that results in poor visibility conditions and blowing snow that makes it virtually impossible to maintain the runways in an uncontaminated condition. The white painted runway markings on which pilots rely are often obscured by blowing snow and ice or difficult to distinguish. Centerline and PRZ lighting will improve pilot perception of the runway environment, reduce takeoff minimums (when combined with availability of additional RVR data), and fulfill a requirement for future CAT II or III approach procedures, which may be feasible when the current glideslope antennas are replaced with more modern models.

*Extend Runway 10 by 550 feet*

Two projects are proposed for providing additional length on Runway 10-28. The first of these is a 550 foot by 150 foot extension to the approach end of Runway 10. The project include a 300 foot long by 150 foot wide RSA in compliance with ARC B-II design standards, an equivalent extension of Taxiway K to the new runway end, medium intensity runway and taxiway edge lights, conversion of the VASI on that runway to PAPI, and installation of REILs. The taxiway would measure 50 feet wide and maintain the current 275-foot runway/taxiway offset. The project would require the acquisition of a single 11.17 acre parcel of vacant land between the current runway end and Airport Road. The land acquisition is required to accommodate the earth embankment, which would extend to within approximately 50 feet of Airport Road, allowing the relocation of the airport perimeter road and security fence around the new runway end. The project would provide runway length of 5,552 feet on the crosswind runway.

*Extend Runway 28 by 210 feet*

The second project to lengthen Runway 10-28 is the extension of Runway 28 by 210 feet. The runway extension would measure 210 feet by 150 feet, and will include an extension of Taxiway H, at a width of 50 feet and a runway/taxiway offset of 275 feet, to the extended runway end. The extension of the medium intensity runway and taxiway edge lights would be part of the project. A standard RSA of 300 feet by 150 feet is included, and the airport perimeter road and fence would be relocated around the bottom of the slope. Combined with the previous project, the length of Runway 10-28 will be extended to 5,762 feet. No property acquisition would be necessary for this project.





### *Improved instrument approach procedure – Runway 28*

Along with additional runway length, the development of a new LPV approach procedure to Runway 28 has been recommended. The new procedure will lower the approach minimums from the current 1 mile to  $\frac{3}{4}$  mile, making it more useful during times of low visibility. Because Runway 28 is the preferred runway during periods of strong westerly winds, the lower minimums will permit aircraft from smaller general aviation “tail draggers” that are very sensitive to crosswind conditions, to larger regional jets, to land and depart Binghamton with a greater degree of safety during strong westerly winds. The expanded Primary Surface that goes along with the lower minimums will impact future landside development on the West Apron.

### *Land Acquisition – Acquire RPZ control*

The reduction in approach minimums for Runway 28 will result in an increase in the size of the Runway Protection Zone beyond that runway. FAA guidance on RPZ identifies certain uses that are prohibited, among them being residences and places of public assembly. The enlarged RPZ beyond Runway 28 will encompass approximately eight residences which, under the FAA guidelines, should be acquired by the airport and the current residents relocated. Because the residences are well below the airfield elevation, however, the airport plans to acquire aviation easements over the property rather than fee simple acquisition. As shown on the ALP, the Runway 28 RPZ reflects both the 550-foot extension of Runway 28 and the increase in size due to lower approach minimums. Easement acquisition is recommended over 31.55 acres.

The airport does not have complete land use control over the RPZ beyond Runways 10 and 34, and the proposed extensions to the Runway 10 end will slightly increase the acreage of RPZ that is not controlled by the airport. The ALP shows 7.43 acres within the Runway 10 RPZ for “Property Acquisition.” This would normally be fee simple acquisition, but because of the extreme vertical distance between the runway end elevation and the ground level within the RPZ, control via an aviation easement may be acceptable. Although the recommended EMAS replacement project on the approach end of Runway 34 will result in additional overall runway length and shifting of the departure RPZ, the fact that the landing threshold will remain in its current location will result in no change to the area of RPZ. Land use control is recommended for the 23.26 acres of that RPZ that is not now owned by the airport.

## **7.4.2 Landside Improvements**

The preferred landside development presented in Chapter 6 of this report incorporates aspects of alternatives presented for the airline terminal area, general aviation area, airport operations area, and aviation dependent business areas. An overview of the recommended landside changes as





shown on the ALP is presented below for each of the aforementioned categories.

### *Airline Terminal Facilities*

The two principal terminal area improvements shown on the ALP are the reconstruction of the air carrier apron and construction of an aircraft de-icing area adjacent to the air carrier apron. The current asphalt apron describes an arc, approximately 1,200 feet in length extending approximately 300 feet either side of the terminal building. Concrete pads are installed in the apron on which the parked aircraft are positioned, and one of the jet bridges has a larger concrete pad on which it maneuvers. The asphalt around the pads is rutted and in poor condition. Asphalt pavements have a limited ability to support parked commercial aircraft, particularly during hot summer months. The proposed project would reconstruct the central portion of the apron in front of the terminal building, approximately 15,000 square yards, with concrete. Some portion of the remaining asphalt pavement should remain in service to provide overnight parking for airplanes when required, but some portion of the pavement may also be suitable for removal to reduce the airport's impervious surface footprint.

As originally described in this report, a dedicated apron drainage system was to be installed in the new apron that would permit aircraft de-icing fluids to be captured and stored for later transport to a treatment and disposal facility. A recent research report by the Innovative Pavement Research Foundation however, has identified potential problems that can occur when de-icing activities occur on concrete pavements. Unless extreme care is taken, diluted de-icing fluids often enter the concrete joints and the freeze/thaw cycle, which can occur on a daily basis, contributes to accelerated deterioration of the pavement slabs. In recent years many major airports have replaced concrete de-icing areas with asphalt as a result of this condition. As a result the previous recommendation has been revised to provide for construction of a dedicated asphalt de-icing apron located adjacent to Taxiway F. As part of this project, Taxiway F would be relocated to the outer edge of the de-icing area and Taxiway G would be eliminated. This project would allow de-icing activities to be relocated to a more central location, convenient to the air carrier apron. The current commercial aircraft de-icing area is very poorly lit, often experiences early morning peak hour congestion, and its location leads to conflicts between users of the North Apron, which will increase as additional hangars are constructed. This project will greatly improve the efficiency and quality of de-icing at the airport.

These two projects will be compatible with a future expansion of the secure passenger waiting areas, which is shown on the ALP as consisting of a slight extension of the terminal façade toward the runway intersection, with the curved front reflecting the shape of the apron. The need for, and design of, this project would be determined by an architectural study to be conducted at a future date.





Other terminal area projects shown on the ALP are an expansion of the terminal parking lot, and development of a rental car “ready return” area consisting of fueling, cleaning, and overflow parking facilities for the airport’s rental car operators.

### *General Aviation Facilities*

Although a consolidation of general aviation activities at the airport would be desirable, the shortage of developable land with airfield access, and the cost of relocating existing facilities make a wholesale consolidation impractical at this time. The recommended general aviation facilities as shown on the ALP represent a first step in a long term consolidation process that may or may not be completed, depending on future aviation demand. Because the FBO and general aviation terminal are located on the West Apron, siting of future general aviation facilities would be preferred in that area. The ALP shows demolition of the former airfield maintenance building on the West Apron and replacement with a new aircraft hangar for general aviation use. Shown with this project is a 2,590 square yard expansion to the east side of the West Apron pavement to provide staging and maneuvering space for the hangar. The airport’s T-hangars are on the North Apron and, due to economic realities, relocation is not recommended at this time although rehabilitation may be pursued. The most southerly of those hangars, however, may be impacted by the proposed demolition of the old Air Cargo building and replacement by an aircraft hangar dedicated to aviation business use. That project would require the removal of the southernmost T-hangar. Future T-hangar growth is not feasible on either the North Apron, where the eventual use is seen as business related, or the West Apron, which will be negatively impacted by the expansion of the Runway 10-28 Primary Surface. Because of this shortage of existing space, development of a new South Apron on the south side of Runway 10-28 is recommended. An apron ultimately containing approximately 32,500 square yards is shown on which are located three T-hangars with the capacity for ten aircraft each, and two conventional hangars for general aviation use. Also shown on the proposed South Apron are tie-down sites for based or long term transient aircraft that must be relocated from the West Apron to keep them out of the expanded Runway 10-28 Primary Surface. A final general aviation item shown is a consolidation of the general aviation parking lots. Located behind Hangar 3 and the GA terminal, several semi-connected parking lots could be consolidated into a single lot with more capacity. While the normal general aviation parking demand is not high, special charter flights operated by Lockheed Martin increase demand on the days they operate, and the consolidation would better serve those users.

### *Airport Operations Facilities*

The ALP shows development of a consolidated parking and storage area for fueling and de-icing vehicles and equipment. A paved containment area is envisioned, with a roof to protect the equipment from snow and ice during winter months, but open sided to permit dispersal of any potentially hazardous vapors. The facility is shown between Hangars 2 and 3 adjacent to the West





Apron, which is a convenient location for the FBO personnel that operate the majority of the vehicles. Also shown is a relocation of the electrical vault and ground vehicle fuel farm from its current location in front of the old airfield maintenance building to a new location alongside the aviation fuel farm near the North Apron. This relocation will permit more efficient use of the West Apron, and the new location will be more convenient for fuel deliveries. The electrical vault is shown as relocated to a spot along the entrance road, out of the way of any new development that may occur in that area. The final proposed airport operations facility shown on the ALP is the reconstruction of the sand storage building. The current structure is not large enough to hold the quantity of sand needed for airport operations, and more importantly, the facility is not able to keep the sand from freezing. The new building should be larger and should have a heating system, perhaps an under-slab system, that is able to keep the sand at a workable temperature when needed. Reconstruction of this building should be coordinated with the demolition of the old airfield maintenance facility, which is heated and is being used to store sand for immediate use. In addition to storing sand, portions of the airport communications system are still located in the old airfield maintenance building and will need to be relocated prior to demolition.

#### *Aviation Dependent/Compatible Business Areas*

One of the Airport Sponsor's major goals is for the airport is to make it a bigger part of the economic development program in Broome County. Airport sites available for economic development are basically of two types: one being for aviation dependent businesses – those that need direct airfield access for their daily operations, and the other for aviation compatible businesses. The latter can be located on airport land that is substantially lower than the airfield and for that reason not suitable for aviation use. The ALP identifies three large parcels, and one smaller one that would be suitable for light industrial or commercial businesses. Two of the large parcels are located along Commercial Drive south of Runway 10-28. The westernmost parcel (Aviation Compatible Development Area 1) contains 70.9 acres. A portion of the site is occupied by the National Weather Service Doppler radar installation, but as documented in the Alternatives chapter the height restrictions associated with that facility would be compatible with most light industrial development. The proposed South Apron is adjacent to this site. The more eastern parcel (Aviation Compatible Development Area 2) contains 85.3 acres and is located nearer to the intersection of the airport's two runways. Again, height restrictions from the Doppler radar, or from the airport's Part 77 surfaces would not hinder industrial development due to the sites' elevation which is 30 to 40 feet below the airfield. A third large parcel (Aviation Compatible Development Area 4) is located south of Knapp Road, and east of the approach end of Runway 16. Finally, a fourth parcel (Aviation Compatible Development Area 3) is located east of the intersection of Knapp and Airport Roads and extending east to Dawes Drive.

The ALP also shows facilities for Aviation dependent business use. Two conventional hangars are shown on the North Apron that would be suitable for expansion of the current business





tenant, Lockheed Martin, or for a new corporate user. Associated with those two new hangars is an expansion of the North Apron by approximately 5,300 square yards. This addition, combined with the relocation of aircraft de-icing activities to the airline terminal area, will provide the terminal apron needed for these users. In conjunction with expansion of business use on the North Apron, the ALP also shows the improvement of a current contractor's access into a new road that will provide direct access to the North Apron without having to utilize the circular entrance road that passes in front of the passenger terminal.

## 7.5 AIRPORT AIRSPACE PLAN

Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace*, regulates the airspace surrounding airports through the establishment of "Imaginary Surfaces," which include the Primary, Approach, Transitional, Horizontal and Conical Surfaces. These surfaces are defined and discussed in Chapter 4, *Facility Requirements*.

Sheets 4 & 5, *Airport Airspace Plan*, depicts the FAR Part 77 Imaginary Surfaces for Binghamton Regional Airport based on the ultimate recommended airside development, a precision approach to each end of Runway 16-34 and an improved approach procedure to Runway 28. These sheets show that the airspace surrounding the airport is clear of obstructions.

## 7.6 INNER APPROACH SURFACE AND RPZ CONTROL PLAN

Due to recent FAA guidance on the preparation of airport master plans, the airspace analysis required for an ALP drawing set has been greatly expanded. A total of six airspace surfaces are required to be shown for each runway end, and for both the existing and proposed runway alignments. Sheets 6 through 15 illustrate these surfaces and the resulting obstructions to those surfaces. The first five sheets illustrate these surfaces as applied to the existing runway ends, and the following five sheets illustrate the surfaces as applied to the proposed runway ends. The sheets are organized as follows:

- Sheet 6: Existing Runway 16-34. This sheet illustrates the Runway Protection Zone (RPZ), the inner portion of the Part 77 Approach Surface (50:1) for precision runways, the PAPI siting surface (1°45'), and the Runway End Siting Surface (RESS) #9 (34:1), applicable to runways supporting a CAT I precision approach procedure. All of the drawings show a plan and profile of two runway ends on each sheet. This drawing shows the Runway 16 surfaces on the left side and the Runway 34 surfaces on the right. Plan view of the surfaces is shown at the top of the sheet and a profile view is shown on the bottom. Numbered obstructions on Sheets 5 through 8 are keyed to tables on Sheet 9.
- Sheet 7: Existing Runway 16-34. This sheet shows one additional RESS relating to





approaches, and two RESS relating to departures. RESS #7 (30:1), applicable to runways supporting approaches with positive vertical guidance, confirms that the runway qualifies for such an approach procedure. RESS #11 (40:1) illustrates the instrument departure surface. Although obstructions may be present to this surface removal may not be necessary, but their presence will impact departure minimums. RESS #12 (62.5:1) illustrates a more restrictive departure surface, the “One-Engine Inoperative Obstacle Identification Surface.” This surface is applicable only to runway ends that support air carrier departures.

- Sheet 8: Existing Runway 10-28. This drawing shows the RPZ, the inner portion of the Part 77 Approach Surfaces (34:1) for non-precision runways with not lower than 1 mile visibility, the PAPI siting surface (1°45'), and RESS #6 (20:1), applicable to runways supporting straight-in instrument approach procedures to greater than Approach Category B aircraft. Although the ARC for Runway 10-28 is B-II, the runway does see use by Approach Category C aircraft so the larger and more demanding surface is shown.
- Sheet 9: Existing Runway 10-28. This sheet shows exactly the same surfaces as are shown on Sheet 6, except that the RESS #7 is shown only for Runway 28, because that is the only runway for which a change in approach visibility minimums has been proposed. The drawing shows that the surface is indeed clear and the runway thus qualifies for an approach procedure with vertical guidance.
- Sheet 10: This sheet contains tables listing the obstructions that have been identified to all the surfaces applicable to the existing runway system. A separate table is shown for each surfaces that has obstructions, and for each obstruction the table lists an obstruction ID number (keyed to the drawings), the type of obstruction, the elevation of the object (MSL), the elevation of the surface at that point, the amount of penetration, and the recommended action. Trees that extend to within ten feet of a surface are identified as obstructions in order for the airport to take corrective action before they actually penetrate the surface.
- Sheet 11: Proposed Runway 16-34. This sheet shows the same surfaces as Sheet 5, but applied to the recommended future runway. The displaced threshold on Runway 16 is reduced from 401 to 200 feet, and the landing threshold on Runway 34 is displaced 200 feet. These changes require the addition of a departure RPZ for Runway 34, but all airspace surfaces remain the same.
- Sheet 12: Proposed Runway 16-34. This sheet shows the same surfaces shown on Sheet 7 as applied to the proposed runway.
- Sheet 13: Proposed Runway 10-28. This sheet shows the same surfaces as shown on Sheet 8 as applied to the proposed runway.
- Sheet 14: Proposed Runway 10-28. This sheet shows the same surfaces as shown on Sheet 8 as applied to the proposed runway.
- Sheet 15: This sheet contains tables similar to those on Sheet 9, but applied to the





proposed runway system

In summary, these sheets show that there are very few obstructions to either the existing or the proposed runway system. The major changes between the existing and future conditions are the expanded RPZ beyond proposed Runway 28 approach end, and the expanded Primary Surface on the proposed Runway 10-28. Both of these are a result of the recommended approach procedure with vertical guidance for Runway 28.

## 7.7 TERMINAL AREA PLAN

The need for a Terminal Area Plan is determined on a case-by-case basis, depending upon the scale of the ALP (Sheet 2). Because the scale of the ALP makes it difficult to clearly illustrate all of the changes that have been proposed in the relatively congested terminal area. Sheet 16 depicts the proposed terminal area development at a scale of 1" : 200'. It illustrates existing and recommended future uses and development for the core area of the airport, but does not include all of the areas recommend for aviation compatible business development.

## 7.8 AIRPORT LAND USE PLAN

Sheet 17, *Airport Land Use Plan* provides general guidance for future land development on airport property and in the vicinity of the airport. Since aircraft noise is a major factor influencing land use compatibility, FAA's Integrated Noise Model (INM), Version 6.2 was used to predict noise levels in the year 2028 based upon the proposed runway extensions and the airport activity forecasts. The forecast chapter of this MPU predicted an estimated a total of 32,247 annual operations by the end of the forecast period. The noise modeling accounts for each of these operations including helicopter operations associated with Lockheed Martin's use of Hangar 1 on the North Apron.

INM estimates aircraft noise levels (in decibels – dB) at ground level, which in most cases is approximated by the elevation of the runway. At BGM, where there is a large difference between the runway level and the level of the surrounding countryside, the forecast levels are applicable to the runway elevation. Noise levels on the ground will therefore be slightly lower than the INM forecast. Noise levels were quantified according to the A-weighted scale (which approximates the range of human hearing) using the Day-Night Average Noise Level (DNL). A DNL of 65 dB is considered by the FAA to be the threshold of impact for noise sensitive areas. The INM output includes noise contours, which are lines of equal loudness, with higher levels centered on the runway and quieter levels expanding outward. As shown on Sheet 17, the 65 and 70 dB noise contours are expected to remain on airport property. No incompatible land uses are located within areas subject to levels of noise exceeding a DNL of 65dB and none are proposed.





In addition to noise levels, this sheet depicts the future recommended land use in the airport vicinity. The land uses shown are based on the current Draft Comprehensive Land Use Plan prepared by Broome County. The Town of Maine, in which the airport is located, has updated the Town zoning in response to this new document. A change in the airport's zoning district from a residential zone to an industrial zone was completed on December 9, 2008. This change was recommended in order to facilitate the desired future industrial development. Recommended land uses for surrounding lands are primarily light industrial, commercial, agricultural, and large lot residential/agricultural uses compatible with proximity to the airport.

## 7.9 AIRPORT PROPERTY MAP

Sheet 18, *Airport Property Map*, shows the airport's current property boundaries as obtained through Broome County property records and airport records. Properties recommended for aviation easements and fee simple interest are also shown. The airport property currently totals approximately 1,200 acres (fee simple). The airport currently holds no aviation easements.

The proposed changes to the airport property boundary are shown on Sheet 18. One parcel is proposed for acquisition. This parcel is associated with the proposed extension of Runway 10. The vacant parcel lies on both sides of Airport Road, but only the portion on the east side of the road will be required for the construction project. Acquisition of an aviation easement restricting land use and the height of objects is recommended for the portion of this parcel on the west side of Airport Road. A portion of this parcel is currently within the RPZ.

Easement acquisition is recommended for ten parcels that would be within the proposed expansion of the RPZ on the approach end of Runway 28 as a result of the proposed 210-foot extension of that runway end and the lowering of approach minimums from one mile to  $\frac{3}{4}$  mile. Some of these parcels are currently within the RPZ, but the actual residences are outside the RPZ. Easement acquisition is being recommended because of the extreme difference in elevation between the runway end and the land within the RPZ. The future runway end will be approximately 160 feet above the land within the RPZ. The final parcel recommended for easement acquisition is located beyond the approach end of Runway 34. The property is currently within the RPZ for that runway, and the proposed changes to the runway will not result in changes to the RPZ because the landing threshold will not be relocated. Table 7.2 below summarizes the proposed acquisitions.





**Table 7.2 – Proposed Airport Property Acquisition**

Key	Tax Parcel ID	Owner	Existing Land Use	Acreage	Proposed Action	Purpose
1	076.03-1-27	Bradford M> & Joyce A. Aumick	Residential	(partial)	Easement	R/W 28 RPZ
2	076.01-1-10	Thomas C. & Debra A. Boyd	Residential		Easement	R/W 28 RPZ
3	076.01-1-9.1	William D. & Myra Demming	Residential		Easement	R/W 28 RPZ
4	076.01-1-8	Wayne S. & Shirley M. Hess	Residential	(partial)	Easement	R/W 28 RPZ
5	076.01-1-18	Patricia Kelsall	Residential	(partial)	Easement	R/W 28 RPZ
6	076.01-1-6	Kenneth C. & Roberta A. Benninger	Residential		Easement	R/W 28 RPZ
7	076.01-1-5	Michael F. Garuto	Residential		Easement	R/W 28 RPZ
8	076.01-1-4	Heather L. Robbins	Residential		Easement	R/W 28 RPZ
9	076.01-1-3	Bruce A & Jacqueline K. Ritter	Residential		Easement	R/W 28 RPZ
10	076.03-1-1	David A. & Theresa A. Fendick	Vacant	(partial)	Easement	R/W 28 RPZ
11	075.04-2-1.12	Edward E. Paden	Vacant	(partial)	Fee simple	R/W 10 Ext
12	075.04-2-1.12	Edward E. Paden	Vacant	(partial)	Easement	R/W 10RPZ
13	075.02-1-30	Hertz Realty Corp	Commercial	(partial)	Easement	R/W 10RPZ
14	075.02-1-29	Hertz Realty Corp	Commercial	(partial)	Easement	R/W 10RPZ
15	076.03-1-24	Robert D. & Cheryl A. Kuzel	Vacant	(partial)	Easement	R/W 34 RPZ

**7.10 PROJECT PHASING PLAN**

A Project Phasing Plan has been developed to identify projects to implement the recommended improvements, and to arrange the projects into a logical sequence. Three phases are used. Phase I identifies short range projects recommended for the period beginning with Federal Fiscal Year (FFY) 2009 and ending in FFY 2013. Phase II projects cover the five-year period beginning in 2014 and ending in 2018, and Phase III covers the final 10-year period from 2019 through 2028. The Phasing Plan includes projects depicted on the ALP along with other major projects, such as design and environmental projects, which are not depicted on the ALP Drawing Set. Necessary basic airfield maintenance that does not involve expansion or construction of new facilities is not included. The project phasing plan is presented in Table 7.3 below.

The phasing recommendations constitute a logical sequence of development to implement the projects presented on the ALP. The projects in the above table are keyed to the ALP by means of the ID numbers, which indicate the Phase (I, II, or III) and number (1, 2, 3, etc.) for each project. The phases are color coded on the ALP to help visualize the proposed phasing.

The landside projects in the Phasing Plan are based upon the forecast levels of activity at the airport. In the event the forecast levels of activity are not attained or are exceeded, the development items can be reprogrammed as appropriate.





Implementation of the phasing schedule depends not only upon the growth of aviation activity, but also upon the future availability of State and federal funding and the airport owner's financial resources. The recommended timing of hangar construction is based upon the aviation forecasts, but also upon the availability of funds. New York State Transportation Bond Act Airport Improvement and Revitalization Grant Program (AIR '99) funds or Multi-Modal funds may be used to fund hangar construction, but when these funds are not available, private funds or local funds are typically used. Implementation of the hangar construction will be based upon the business decisions of the airport management and airport users. Thus, the phasing of hangar construction is flexible.

**Table 7.3, Project Phasing Plan**

ID	Project
<b>Phase I</b>	
I-1	Runway 34 EMAS Replacement
I-2	Relocate Runway 16 MALSR and relocate glideslope to reduce threshold displacement
I-3	Air carrier Apron rehabilitation – including glycol capture drainage system (15,000 sy)
I-4	Construct private hangar (23,800 sf)
I-5	Reconstruct sand storage building
I-6	Demolish former airfield maintenance building
I-7	Connecting link in Runway 10-28 parallel taxiway (1,700' x 50')
I-8	Relocate electrical vault & ground vehicle fuel farm
I-9	Construct terminal de-icing area
<b>Phase 2</b>	
II-1	Design & Construct fueling & de-icing vehicle spill containment & parking area
II-2	Construct private hangar (20,000 sf)
II-3	Expand West Apron (2,590 sy)
II-4	Consolidate General Aviation parking
II-5	Demolish Air Cargo building
II-6	Design & Construct North Apron roadway
II-7	Design private hangar 22,500 sf
II-8	Expand North Apron (5,310 sy)
II-9	Runway 10 extension
II-10	Runway 28 extension
<b>Phase 3</b>	
III-1	Acquire land use control Runway 28 RPZ
III-2	Design & Construct South Apron (32,000 sy)
III-3	Design & Construct rental car ready/return
III-4	Expand terminal parking (6,640 sy)
III-5	Install runway centerline lights – Runway 16-34
III-6	Conduct terminal space allocation study
III-7	Construct South Apron Hangars





## 7.11 CAPITAL IMPROVEMENT PLAN

The Airport Capital Improvement Plan (ACIP) for the Greater Binghamton Airport for the years 2009 through 2014 is presented in Table 7.4. It should be noted that the ACIP includes a number of maintenance type projects and equipment purchases that have not been covered in the Master Plan, and are not shown on the ALP because there will be no change in layout. The ACIP lists the Phase I Projects, the highest priority projects over the next five years, and identifies estimated project costs, and potential funding sources for each project. Any airport that desires funding from FAA must submit and/or update its five-year ACIP to the FAA on an annual basis. The annual ACIP update process is used by FAA to prioritize its funding program on a State-wide basis in light of system-wide considerations, which include both safety and capacity. These planning-level cost estimates are used for program development.

The ACIP does not constitute a commitment on behalf of either FAA or the airport sponsor to fund any of the projects, nor does it assume any required local or environmental approvals.

Currently, projects eligible for funding through the FAA Airport Improvement Program (AIP) can receive up to 95 percent funding from FAA and another 2.5 percent from the New York State Department of Transportation (NYSDOT). The airport sponsor is responsible for the remaining 2.5 percent of eligible project costs. At BRA; the sponsor's share is funded through the collection of Passenger Facility Charges (PFCs).

The majority of development projects at BRA are funded with federal AIP dollars as the main source of funding. NYSDOT also provides wholly funded State programs to assist aviation development. These programs vary from year to year and are generally targeted toward projects that may not be eligible for AIP funding, such as airport owned fuel facilities, hangars, and terminal buildings. From 1996 to 2000 the Multi-Modal program provided \$350 million in grants for all modes of transportation, including aviation. The total amount granted to aviation projects was approximately the same as through the earlier Special Aviation Transportation Program (SATP). For both of these programs, members of the State Legislature submitted project requests. Air '99 is another NYSDOT program that is directed toward non-AIP eligible projects. Eligibility requirements for State funded projects are often, but not always, broader than those for AIP funding. State funding may be used for items such as hangars and fuel farms.

Private investment is also expected to play a role in the development of airport projects listed in the phasing plan. Tenants and/or investors may finance the construction of hangars or other facilities from which they derive income. Land lease arrangements are often used to permit a business owner to construct a facility on airport property. In summary; the airport is likely to see funding from many different sources including both public and private.



# Airport Capital Improvement Plan

(FY2009-2014)

**Federal Aviation Administration**

1. Airport Greater Binghamton Airport		2. State New York				3. NPIAS NO: 3-36-0008		4. LOC ID BGM	
5. Project Description <i>(by Funding Year in Priority Order)</i>	FEDERAL FUNDS		State Funds	LOCAL		Total \$	Environmental Status	Start Date	Completion Date
	Discretionary	Entitlement		PFC	OTHER				
2009 Terminal Apron Rehabilitation - Design		\$ 285,000	\$ 7,500	\$ 7,500		\$ 300,000	Cat Ex	11/2008	5/2009
2009 Runway 16-34 Safety Area Improvements , EA & RA Scoping		\$ 313,500	\$ 8,250	\$ 8,250		\$ 330,000	Cat Ex	1/2009	12/2009
2009 Snow Equipment Replacement		\$ 456,553	\$ 12,012	\$ 12,012		\$ 480,577	Cat Ex		
2009 North Apron Rehabilitation, Phase I Design				\$ 30,000		\$ 30,000	Cat Ex		
2009 North Apron Rehabilitation, Phase I Construction		\$ -		\$ 300,000		\$ 300,000	Cat Ex		
2009 T Hangar Construction, Phase I - Design and Construction			\$ 600,000		\$ 150,000	\$ 750,000	Cat Ex		
<b>2009 Entitlements Estimated @ \$1,200,000</b>									
<b>2009 Totals</b>	<b>\$ -</b>	<b>\$ 1,055,053</b>	<b>\$ 627,762</b>	<b>\$ 357,762</b>	<b>\$ 150,000</b>	<b>\$ 2,190,577</b>			
2010 Runway 16-34 Safety Area Improvements - Design	\$ -	\$ 902,500	\$ 23,750	\$ 23,750	\$ -	\$ 950,000	EA	1/2010	12/2010
2010 Terminal Apron Rehabilitation - Construction	\$ 3,975,000	\$ 400,000	\$ 125,000	\$ 500,000		\$ 5,000,000	Cat Ex		
2010 AIR '99			\$ 300,000		\$ 30,000	\$ 330,000	Cat Ex		
<b>2010 Entitlements Estimated @ \$1,200,000</b>									
<b>2010 Totals</b>	<b>\$ 3,975,000</b>	<b>\$ 1,302,500</b>	<b>\$ 448,750</b>	<b>\$ 523,750</b>	<b>\$ 30,000</b>	<b>\$ 6,280,000</b>			
2011 West Apron Rehabilitation - Design	\$ -			\$ 175,000		\$ 175,000	Cat Ex	1/2010	12/2010
2011 Runway 16-34 Safety Area Improvements	\$ 12,100,000	\$ 1,200,000	\$ 350,000	\$ 350,000		\$ 14,000,000	EA		
<b>2011 Entitlements Estimated @ \$1,200,000</b>									
<b>2011 Totals</b>	<b>\$ 12,100,000</b>	<b>\$ 1,200,000</b>	<b>\$ 350,000</b>	<b>\$ 525,000</b>	<b>\$ -</b>	<b>\$ 14,175,000</b>			
2012 West Apron - Construction, Phase I	\$ -	\$ 1,200,000	\$ 31,563	\$ 31,563		\$ 1,262,500	Catex		
2012 Snow Equipment Replacement		\$ -	\$ -	\$ 350,000		\$ 350,000	Cat Ex		
<b>2012 Entitlements Estimated @ \$1,200,000</b>									
<b>2012 Totals</b>	<b>\$ -</b>	<b>\$ 1,200,000</b>	<b>\$ 31,563</b>	<b>\$ 381,563</b>	<b>\$ -</b>	<b>\$ 1,612,500</b>			
2013 West Apron - Construction, Phase II	\$ -	\$ 630,000	\$ 29,007	\$ 500,000		\$ 1,160,289	Catex		
2013 ARFF Truck Replacement		\$ 570,000	\$ 15,000	\$ 15,000		\$ 600,000	Cat Ex	3/2012	12/2012
<b>2013 Entitlements Estimated @ \$1,200,000</b>									
<b>2013 Totals</b>	<b>\$ -</b>	<b>\$ 1,200,000</b>	<b>\$ 44,007</b>	<b>\$ 515,000</b>	<b>\$ -</b>	<b>\$ 1,760,289</b>			
2014 Construction of Parallel Taxiway H - Design		\$ 237,500	\$ 6,250	\$ 6,250		\$ 250,000	Cat Ex	3/2012	12/2012
2014 Snow Equipment Replacement		\$ 475,000	\$ 12,500	\$ 12,500		\$ 500,000	Cat Ex		
<b>2014 Entitlements Estimated @ \$1,200,000</b>									
<b>2014 Totals</b>	<b>\$ -</b>	<b>\$ 712,500</b>	<b>\$ 18,750</b>	<b>\$ 18,750</b>	<b>\$ -</b>	<b>\$ 750,000</b>			
<b>TOTAL</b>	<b>\$16,075,000</b>	<b>\$5,957,553</b>	<b>\$1,502,082</b>	<b>\$2,303,075</b>	<b>\$180,000</b>	<b>\$26,018,366</b>			