



# McGhee Tyson Airport

Airport Master Plan - 2006



Executive Summary

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## Introduction

Airports serve as an important transportation resource to meet the needs of the air traveling public. In order for airports to continue to meet the needs of their customers, including air travelers, airlines, general aviation fliers, air cargo transporters, and the military, plans must be made to adapt the airport facilities to changing needs. In 2006, The Metropolitan Knoxville Airport Authority (MKAA), the administrative body that operates the McGhee Tyson Airport, completed an Airport Master Plan which looks at the future and how the Airport will need to develop to meet the growing demands.



## Mission and Vision

As part of the Master Plan initiation, the MKAA conducted a visioning process to set the stage for the planning study. Through a collaborative effort with the Airport's stakeholders, the following mission and vision were established:

### Mission Statement

**MKAA provides high-quality facilities and services to meet aviation-related needs and to support development of East Tennessee.**

### Vision Statement

**As a regional hub of aviation-related activities, MKAA provides its customers the highest-quality transportation experience by exemplifying effective communication, stewardship and hospitality.**

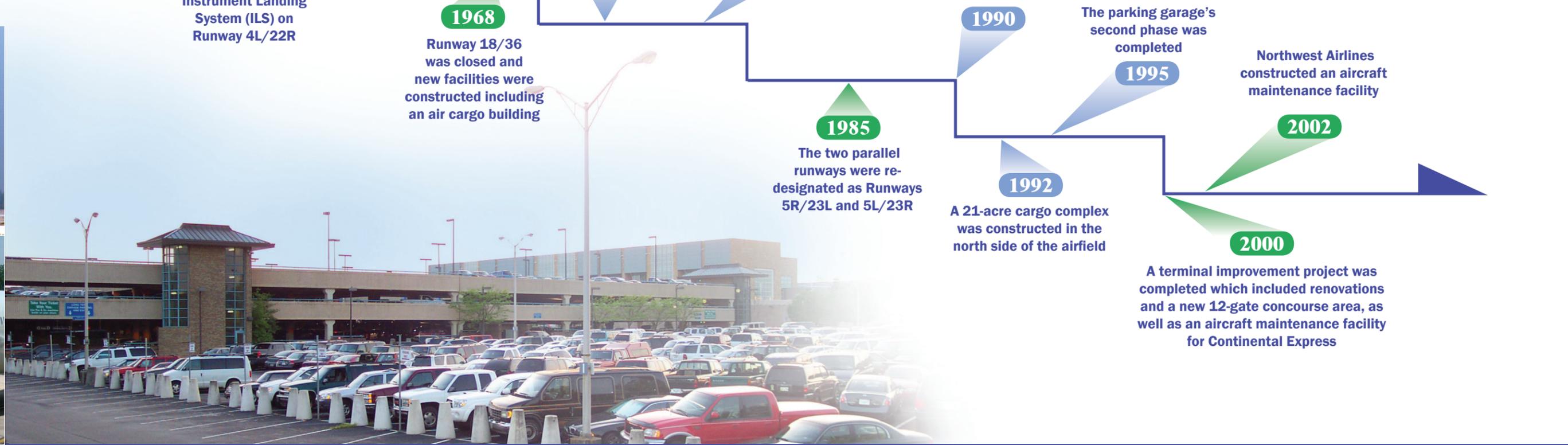
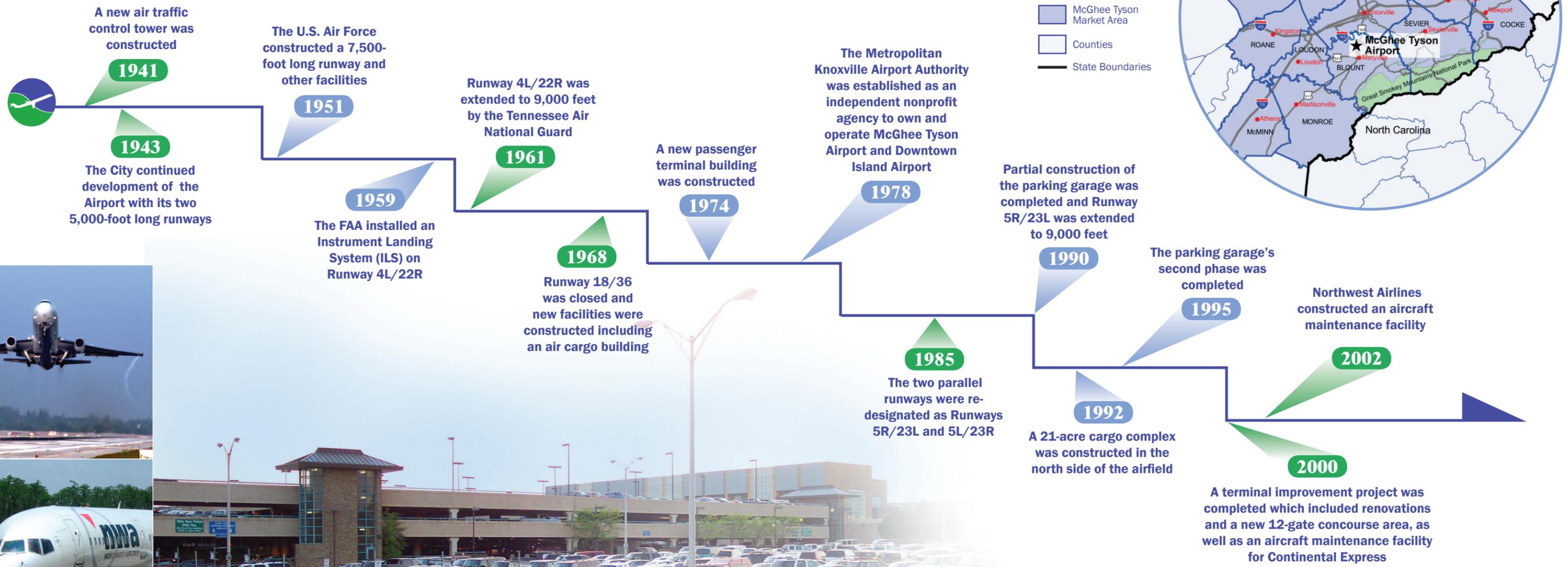
The mission and vision statements were then used to identify priorities for future development, as well as objectives for the Master Plan. It was noted that the Master Plan should meet the following objectives and reflect the following characteristics:

- An actionable plan
- Understandable at all levels
- Plan that reflects the total operational needs of the MKAA
- Maximizes the revenue stream
- Identifies grants/funding needs
- Effective use of available lands/surrounding land uses
- Acceptable to the FAA and other reviewing agencies

# Airport Facilities

McGhee Tyson Airport, originally located on a 60-acre tract in West Knoxville, was opened in 1927 and named in honor of a local aviator, Charles McGhee Tyson, Lieutenant, U.S. Naval Air Corps, who was shot down and killed during World War I. In 1935, the City of Knoxville purchased 351 acres of property at the Airport's current site to develop a facility capable of accommodating air carrier traffic. Since that time there has been significant development at the existing Airport site including the following:

Today, the Airport continues to diligently maintain its role in serving the East Tennessee region as a commercial airport and economic generator.



## Master Plan Process

The Airport Master Plan process follows traditional guidelines established by the Federal Aviation Administration (FAA). For McGhee Tyson Airport, this traditional process was enhanced to address additional needs of the Airport. The result of the Airport Master Plan is an Airport Development Plan, depicted as part of an FAA-approved Airport Layout Plan that can be used by the Authority to guide them through the Airport's future development.



## Airport Activity

The level of activity generated at an airport determines the type and size of facilities that are needed. At McGhee Tyson Airport, facilities must be provided to serve commercial airline service, air cargo activity, general aviation flying, and military operations. Over the years, these activities have changed and grown. The following summarizes some of the growth in activity that has occurred:

- Enplaned passengers grew from 435,000 in 1984 to over 800,000 in 2005
- Annual air cargo tons have increased from 29,000 in 1991 to over 35,200 in 2005
- Total aircraft operations have increased from 127,000 in 1992 to over 138,000 in 2005

To determine the type, size, and timing of future development needs, projections of future activity were prepared for McGhee Tyson Airport. Factors such as national and local aviation trends, changes in regional socioeconomic and demographic indicators, and forecasts prepared by the FAA were considered in the development of the activity projections. The following summarizes the anticipated levels of Airport activity projected over the 20-year planning period for McGhee Tyson Airport.

It is important to note that actual Airport development will be initiated as needed to meet activity levels that occur. While the forecasts are used to determine the facility needs, the timing of the development will coincide with these activity levels as they are achieved.

SUMMARY OF DEMAND - MCGHEE TYSON AIRPORT

	Actual 2004	Forecast 2009	Forecast 2014	Forecast 2024	*AAGR 2004 - 2024
<b>Enplaned Passengers</b>	<b>806,240</b>	<b>1,009,900</b>	<b>1,201,500</b>	<b>1,640,000</b>	<b>3.61%</b>
<b>Aircraft Operations</b>					
<i>Passenger Airlines - Air Carrier</i>	5,615	6,200	7,100	9,200	2.50%
<i>Passenger Airlines - Commuter</i>	39,864	46,700	50,700	60,200	2.08%
<i>Cargo</i>	3,922	4,200	4,600	5,400	1.61%
<i>General Aviation + Air Taxi</i>	74,994	78,800	82,800	91,400	0.99%
<i>Military</i>	15,083	15,000	15,000	15,000	-0.03%
<i>Total</i>	<b>139,478</b>	<b>150,900</b>	<b>160,200</b>	<b>181,200</b>	<b>1.32%</b>
<b>Air Cargo (Tons)</b>	<b>35,225</b>	<b>43,800</b>	<b>52,400</b>	<b>70,300</b>	<b>3.51%</b>
<b>Based Aircraft (incl. Military)</b>	<b>174</b>	<b>186</b>	<b>200</b>	<b>230</b>	<b>1.40%</b>
<i>Operations per Based Aircraft</i>	540	521	503	469	-0.70%
<b>Passenger Airlines</b>					
<i>Average Aircraft Size</i>	54	57	61	68	1.16%
<i>Average Load Factor</i>	66.0%	67.0%	68.1%	69.5%	0.26%

SOURCE: WSA Forecast – Wilbur Smith Associates, January 2005, for calendar years  
\*AAGR – Average Annual Growth Rate

(2004 actual activity serves as the forecast base year)

## Airport Development Needs - Airside

It is vital that McGhee Tyson Airport provide the necessary facilities to accommodate the anticipated increase in aviation activity. Using FAA and standard planning analyses, each of the Airport's airside facilities was evaluated to determine its ability to meet future needs. The most important airside facilities include the runways and taxiways which must not only be capable of accommodating demand, but must be well maintained to ensure the safety of the users.

The airfield was evaluated in terms of its capacity to accommodate aircraft operations. While the existing airfield is functioning at approximately 55 percent of its annual capacity, by the end of the 20-year planning period, the analysis estimated that the Airport would reach 72 percent. This indicates that while not needed in the immediate future, additional airfield capacity should be planned for the future. A new parallel runway was recommended as part of the 1987 and 1994 Master Plans and is included as a future recommendation for this plan. In addition, 1,000-foot extensions to the existing parallel runways are recommended to accommodate airlines who want to operate aircraft to further destinations. Additional taxiway improvements, including high-speed taxiways and realignment of a taxiway near the end of Runway 23L to meet current FAA taxiway design standards, were also recommended.

In terms of general aviation facilities, the Airport has a current need for additional aircraft storage and forecasted activity will further this need in years to come. Additional areas for future fixed-base operator (FBO) facilities, as well as the development of corporate aviation facilities were important considerations in the evaluation process.



## Airport Development Needs - Landside

To support an airfield, facilities are needed to provide access including the roadway system, terminal area, and parking. These facilities, typically referred to as landside facilities, are evaluated based on projected levels of demand for the Airport and are recommended for improvement when they reach an unacceptable level of service.

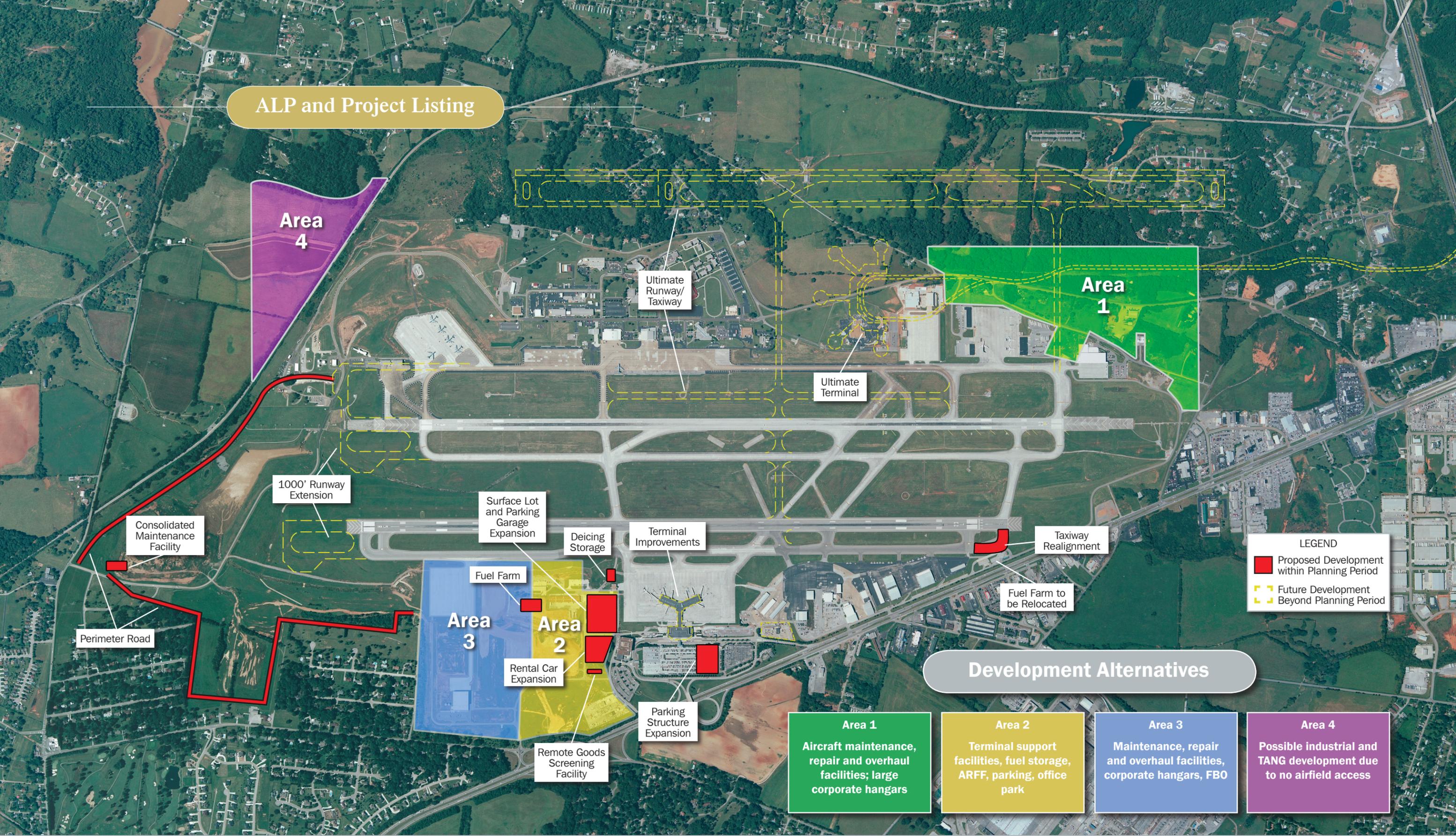
It is important that as local off-Airport improvements are made, that close coordination with local agencies be maintained to ensure convenient access to the Airport. The Tennessee Department of Transportation (TDOT) has developed a proposed highway alignment to connect Pellissippi Parkway and Hunt Road, allowing area drivers to bypass congested portions of Alcoa Highway near the Airport while maintaining access to the Airport's internal roadway system. As part of the proposed alignment, the existing Alcoa Highway which leads to the front of the Airport's main terminal entrance would be realigned. Vehicular and truck access to existing cargo and other facilities in the West Aviation Area at the Airport are also part of the proposed alignment.

Expansion of certain terminal facilities was also identified including ticket counter queuing, baggage services and baggage claim area, food and beverage concessions, and public circulation. The need for additional facilities is based on projected peak activity and will require additional analyses as time progresses and activity levels are re-examined. As with the airfield, most of the existing terminal facilities are adequate to accommodate demand within the 20-year planning period. However, a mid-field terminal was shown on previous Master Plans and will continue to be shown as the Airport's ultimate development beyond the 20-year period. This mid-field terminal is also tied to the ultimate development of a new runway designed to accommodate air traffic beyond the 20-year planning period.

Additional general aviation facilities were also identified as a need in the future, in addition to expansion of the air cargo facilities, a consolidated maintenance facility, aviation support facilities and expanded parking facilities.



# ALP and Project Listing



## Environmental Overview

An environmental overview was conducted as part of the Master Plan to serve as a preliminary identification of those environmental considerations that will require more analysis within a National Environmental Policy Act (NEPA) process. The environmental review examined the consequences of the recommended list of projects at the Airport as noted in the Master Plan. Guidance on the environmental analysis was provided by the FAA through its Airport Environmental Handbook (Order 5050.4A) and the newer Order 1050.1E.

Categories that were examined as part of the process included noise, compatible land use, air and water quality, wetlands, and other important environmental considerations. The recommended projects at McGhee Tyson Airport that are anticipated in the short term period do not appear to require significant environmental documentation as they are not anticipated to have a significant effect on the human environment. As the projects are programmed for funding, additional review should be undertaken to ensure appropriate consideration is given to issues such as wetlands, coordination with the Army Corps of Engineers, and minimizing erosion.



## Capital Improvement and Master Plan Projects

Current capital improvement projects as well as Master Plan projects designed to meet forecasted demand have been identified for the 20-year planning horizon, from 2005 through 2024. The proposed Master Plan project costs are estimated to total approximately \$109.2 million. The McGhee Tyson Airport 5-Year Capital Improvement Program shows project costs estimated at \$75.6 million. Based on the project timing, which involved estimation as to the demand of new or rehabilitated facilities, all project costs are assumed to be expended during the period fiscal year 2007 through fiscal year 2016. Some of the major improvement projects considered as part of the Master Plan include:

- Airfield pavement maintenance and rehabilitation
- On-going capital projects in the Airport's West Aviation Area
- Taxiway realignment and subsequent fuel farm relocation
- Deicing storage pad relocation
- Terminal improvements
- Parking and rental car facility expansion
- Consolidated maintenance facility development
- Potential cargo facility expansion
- Security enhancements

### TOTAL PROJECT COSTS 2005-2024

Master Plan .....	\$109.2 million
Capital Improvement Plan .....	\$75.6 million
<b>Total .....</b>	<b>\$184.8 million</b>



## Financial Analysis

The Master Plan process has evaluated the future facility needs of McGhee Tyson Airport based on projected demand. An important consideration in developing the recommended plan for the Airport is the financial analysis of the implications of development. The financial analysis evaluates and compares the financial needs of the capital development program to the ability of the Airport to fund the program through various funding sources. While the FAA and TDOT assist with funding of eligible projects through programs such as Passenger Facility Charges, Airport Improvement Programs, and block grants, the MKAA must also contribute to the development costs. MKAA generates monies to cover operating expenses of the Airport as well as capital programs through means such as the following revenue sources:

- Airport bonds
- Leases and fuel flowage fees
- Rental car concessions
- Advertising, food and beverage, and news and gift concessions
- Parking
- Airline landing fees and terminal rents



**It is critical that MKAA continue to pursue Federal and State funding to assist with the future development of the Airport.**

## Public Involvement Process

An airport is an extension of a region's transportation system and must be considered in the context of other public infrastructure. To ensure consistency and obtain input, an extensive public involvement process was maintained throughout the Master Plan. In addition to public information meetings, a Technical Advisory Committee and Community Advisory Committee were established to obtain input in the planning process. These committees met at key milestones to review the study's progress, recommend direction for the plan, and ensure consideration of the community's interests in maintaining a safe and effective commercial service airport.



The following community members were invited to participate in the Master Plan process:

### Technical Advisory Committee

Air Transport Association  
 Alamo/National Car Rental  
 American Eagle  
 Avis Rent-A-Car  
 Blount County Planning Department  
 Budget Rent-A-Car  
 City of Alcoa and Planning  
 City of Maryville Planning  
 Comair  
 Continental Airlines  
 Delta Air Lines  
 DHL Express  
 Enterprise Car Rental  
 FAA, Airways Facilities  
 FAA, Memphis Airports District Office  
 Fed Ex

Hertz Corporation  
 Hilton Knoxville Airport  
 Northwest Airlines (Pinnacle Airlines)  
 Paradies  
 Republic Parking  
 Ruby Tuesday  
 Skywest  
 TAC Air  
 TDOT Division of Aeronautics  
 Tennessee Air National Guard  
 Thrifty Car Rental  
 Knoxville Regional Transportation Planning Organization  
 Transportation Security Administration  
 United Parcel Service  
 US Airways Express

### Community Advisory Committee

Alcoa City Manager  
 Blount County Mayor's Office  
 Blount Partnership  
 City of Knoxville-Communications  
 East TN Development District  
 FAA Air Traffic Control Tower and Government Relations

Knoxville Area Chamber Partnership  
 Knoxville Mayor's Office  
 Maryville City Manager  
 Metropolitan Planning Commission  
 Oak Ridge Economic Partnership

## Pavement Management Plan

Establishment of an airport pavement management plan provides McGhee Tyson Airport with the information needed to proactively manage the maintenance and rehabilitation of the pavement infrastructure in the most fiscally responsible manner possible and to anticipate pavement-related funding needs. Further, it provides the Airport and MKAA with the information needed to remain in compliance with Public Law 103-305 (Grant Assurance #11) regarding pavement maintenance management.

A detailed pavement condition evaluation was conducted using the Pavement Condition Index (PCI) procedure. During a PCI evaluation, visible signs of deterioration are identified and the defects characterized in terms of type of distress, severity level of distress, and the amount of distress. The PCI number provides an overall measure of condition and an indication of the level of work that will be required to maintain or repair a pavement. The overall area-weighted condition of McGhee Tyson Airport's pavements is 90 on a scale from 0 to 100 (with 100 representing a pavement in excellent condition).

The importance of identifying not only the best repair alternative but also the optimal time of repair is critical. The financial impact of delaying repairs can mean repair expenses 4 to 5 times higher than repair expenses triggered over the first 75 percent of pavement life.



## Physical Service Analysis

**GIS** – Geographic Information Systems (GIS) results were incorporated into the final Master Plan. The Team worked to develop the GIS element to coordinate findings, data, recommendations and other relevant information from the Master Plan that need to be incorporated into the GIS effort.

**Grading** – An overall master grading plan was developed for McGhee Tyson Airport. This effort consisted of reviewing existing facility designs to determine where grading modifications are necessary, and providing for incorporation of grading on future development projects consistent with the overall Master Plan.

**Utilities** – Requirements for utility services, including water distribution, sanitary sewer facilities, storm sewer facilities, electrical systems, natural gas, and telecommunication lines were incorporated into the Airport Layout Plan as part of the Airport Master Plan.

**Surveying** – As part of this study, efforts were made to improve the horizontal and vertical controls on the Airport. Initially, ten new control monuments were surveyed and marked. Survey and deeds research was completed in order to prepare a Property Boundary drawing to be included in the Airport Layout Plan as part of the Airport Master Plan.

Finally, all physical service analyses will be used to update the McGhee Tyson Airport survey information and property reference systems.



## Future Planning

For the Master Plan to serve as an effective tool for McGhee Tyson Airport, performance measures should be continually monitored and revised to reflect changing conditions within the aviation industry as a whole, as well as economic conditions in the East Tennessee region. Growth in activity, changes in airline conditions, financial results, and funding priorities must be closely watched to determine if the recommended projects continue to be appropriately scheduled. The size, timing, and scheduling of capital projects are constantly considered based on changing conditions to provide flexibility needed to meet identified needs.

While a full update of the Master Plan is typically undertaken every five to seven years, updates of various portions may be warranted at earlier intervals to address near term issues. Roadway development, new cargo operators, and growth in demographic factors beyond what has been anticipated all have the potential to impact the planned capital development projects. MCAA practices a policy of focused and controlled growth, ensuring that the Airport's position as the air transportation hub in the region is maintained and that appropriate planning is conducted to ensure the Airport's long term viability.





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