ASSESSING THE VALUE OF AVIATION ACCESS TO THE METRO-KNOXVILLE ECONOMY

October 2011

Preparation Supervised by

Mark L. Burton
Director, Transportation Economics
mburton3@utk.edu

On Behalf of

The Metropolitan Knoxville Airport Authority
Alcoa, Tennessee

THE UNIVERSITY of TENNESSEE
Center for Transportation Research

1. INTRODUCTION AND EXECUTIVE SUMMARY

1.1 Study Introduction

The availability of aviation through well-functioning commercial and general aviation airports can be a valuable building block for both sustaining and growing a regional economy. Airports provide access in ways that cannot be duplicated by surface transportation. This access is critical to several specific lines of commerce, beneficial to the region's more general business climate, and a measurable contributor to the overall quality of life within a region.

Therefore, while airport facilities are not a substitute for other necessary regional resources, their development and availability must be an important part of the regional planning process. Aviation access amplifies the value of nearly every other regional asset. Within the greater metropolitan Knoxville area, oversight for this work is primarily the responsibility of the Metropolitan Knoxville Airport Authority (MKAA) which directs activities at both the McGhee Tyson Airport (TYS) and the Downtown Island (Island Home, DKX) Airport.

Within Knoxville, as elsewhere, the role played by aviation access and its corresponding value to the regional economy is constantly changing. Technology-based regional job growth, maturing tourism, and the continued emergence of low-fare passenger airlines all imply an ever-evolving role for Knoxville's airports and the services they support. Forward-looking planning requires the assessment of the economic impacts attributable to these airports both under current and foreseeable economic conditions if aviation access is to continue to meet critical regional needs. It is within this context that the University of Tennessee's Center for Transportation Research (CTR) provides the information that follows.

1.2 Summary of Methodology

The current analysis had three aims – **(1)** to accurately identify and measure the direct economic activity that is attributable to airport-supported commerce, **(2)** to evaluate the broader regional economic impacts that are, again, attributable to the availability of TYS and DKX, and **(3)** to look forward in anticipation of how the economic role of aviation may change within the foreseeable future. The Executive Summary briefly describes the empirical results developed as a response to the first two of these three goals. Information treating the future role of MKAA facilities is provided in Section 5.

In order to accomplish the first of the goals, the CTR study team worked closely with MKAA management and staff to develop primary information describing airline and passenger activity, air freight services, on-field retail (car rentals, food sales, etc.), military and other government operations, general aviation support activity, and MKAA airport management and operation services. This information was, then, combined with data from secondary sources to generate estimates of the off-field activities – particularly visitor expenditures – that are also directly attributable to aviation availability.

The broader characterization of the regional economic impacts was developed through two methods. First, the direct airport-related employment and sales data were used as inputs within an economic simulation to estimate the related regional impacts. This involved the use of IMPLAN, a proprietary simulation software product.[1] The IMPLAN simulation results capture the full range of economic activities that are both directly and indirectly induced by the activities immediately associated with the airport. These impacts do not, however, account for the more generalized reductions in business costs, increased firm-level productivity, or overall public convenience associated with the commercial and general aviation services provided by TYS and DKX. In order to capture these "ancillary" benefits, the study team relied on similar benefit calculations from a variety of domestic airport studies, in combination with data describing characteristics of the regional economy and specific Knoxville area air travel.

1.3 Summary of Results

A full set of analytical results is provided in Section 4. These results are summarized here in Table 1-1. As might be expected, the employment, income, and output (total sales) impacts are focused in the transportation and services sectors. This reflects the fact that the results are driven by the provision of transportation, lodging, and food services to area visitors and that a substantial portion of locally derived incomes are spent in the consumption of goods and services that are produced outside the study region.

Table 1-1
(Monetary Amounts in 2010 Dollars)

Estimation Result	Values
Regional Employment (Full Time Equiv.)	4,630
Regional Incomes (Annual)	$218 Million
Traceable Regional Economic Activity (Annual)	$462 Million
Ancillary Economic Value (Annual, Includes DKX)	$154 Million
Total Annual Economic Value (Annual)	$616 Million
20-Year Present Value (Discount Rate = 3%)	$9.164 Billion

The results reported in Table 1-1 suggest that McGhee Tyson plays an important and necessary role within the regional economy. This conclusion is further bolstered when the MKAA facilities and the greater Knoxville region are compared to similarly sized airports and metro areas elsewhere in the US. The aviation access and resulting amount of economic activity in East Tennessee are, at least, on a par with what would be expected and, in many ways, represent a measurable regional advantage. This is, however, an advantage that has been hard-won and one that must be continually tended.

[1] For the purpose of the current analysis, the affected study region was defined to include Anderson, Blount, Knox, Loudon, and Sevier Counties.

2. AIRPORT ACCESS AND ECONOMIC IMPACTS

2.1 Economic Impacts, Benefits, and Regional Analysis

Access to airport facilities impacts regional economic outcomes in a variety of ways.[2] It connects local populations to the nation and regions beyond. It provides access to inbound visitors, facilitates regional commerce, enhances available air cargo services, and supports aviation-related leisure. Similarly, calculated economic impacts can be used in a number of different applications. Economic results may be used to identify the benefits that justify airport facility expansions. They may inform potential investors regarding the value of emerging transport-related opportunities. Or they can form an important part of a broader regional economic representation that helps both policy-makers and the general population to evaluate their accomplishments and to consider their future course.

In everyday conversation, the terms "benefit" and "impact" are often used interchangeably. However, within regional economics, these terms have very specific and substantially different meanings. *Benefits* refer to the magnitude of incremental efficiency gains associated with an action after transfers between individuals or groups are netted out of the calculations. *Impacts* are a more general term that may include both benefits AND transfers to one or more affected groups. For example, an air traffic control improvement that lowers the costs of operating to and from McGhee Tyson without affecting operating costs elsewhere will generate a benefit equal to the sum of the reduced costs. By contrast, a promotional campaign that diverts airline passengers from other airports to TYS will certainly have a regional impact even though it probably does not involve any incremental economic benefit. Isolating economic benefits is very important when formally evaluating proposed projects. However, from the standpoint of regional understanding, it is the magnitude of regional impacts that often conveys the most useful information. For this reason, it is the concept of economic "impacts" that is used here.

2.2 Multipliers and Defining the Study Region

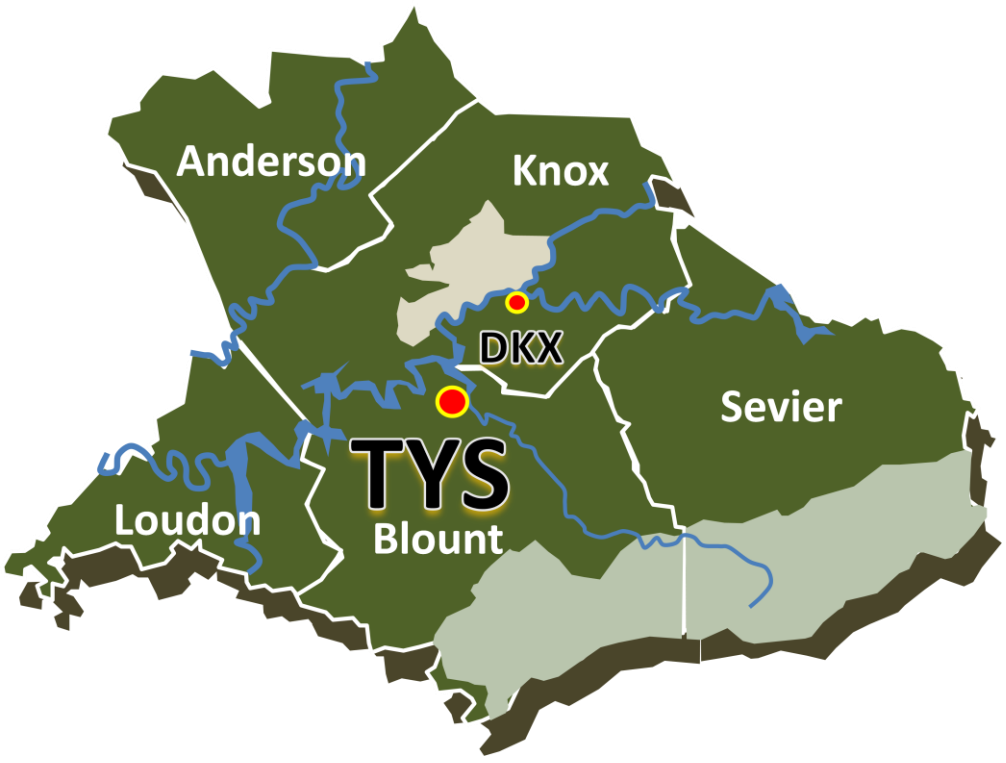
Most discussions of regional economic impacts quickly turn to a discussion of "multipliers". This term reflects the fact that any single economic transaction unleashes a sequence of related transactions within the economy being studied. For example, consider a purchase at an airport eatery. This purchase results in many related transactions – the vendor must restock inventories, pay for utilities used at the time of the transaction, and compensate its employees who prepared and served the food. Both the vendor and its employees will, in turn, use their newly-earned incomes to make other purchases. This process continues through what can seem like an infinite number of additional transactions. In the end, the sum of the economic activity associated with the original food purchase is some "multiple" of the original purchase price. Thus, analysts will often talk about regional "multipliers" as a short-hand way of capturing total impact of the sequence of transactions.

[2] In the current context, airport access includes access to scheduled passenger service, general aviation (including Part 135 service), air cargo and air freight service, and aircraft maintenance.

The magnitude of regional multipliers depends on several factors. These include the nature of the original transaction, the mix and extent of goods and services available within the defined study area and, therefore, the geographic reach of the defined study region itself. Generally, larger and more complex regional economies are associated with larger multipliers. This is because, more of the transaction sequence can occur entirely within the region of interest. Alternatively, small regions or regions without much incumbent economic activity tend to be associated with relatively small multipliers reflecting the fact that the economic activity quickly "leaks" outside of the study region. As a rule of thumb, multipliers for multi-county regions, including a metropolitan area will typically range between 1.5 and 2.5. On the other hand, regional definitions that consider many states or even the nation as a whole will more typically produce multipliers nearer to 5.0.

For purposes of the current analysis, the study region is defined to include five Tennessee counties – Anderson, Blount, Knox, Loudon, and Sevier. This study area is depicted in Figure 2.1. It should be noted, however, that commerce pays little attention to the jurisdictional boundaries on maps. Thus, while most of the direct and indirect economic activity associated with McGhee Tyson and DKX are supposed to be within this region, there are, no doubt, innumerable exceptions that extend the reach of these facilities further.[3]

Figure 1-1
Current Study Region



[3] In 2006 the MKAA released its current *Master Plan*. Much of the analysis within that document references a service area in East Tennessee that is broader than the five county region used here. Given the focus of the Master Plan, this was appropriate just as a smaller study area is appropriate to a discussion of economic impacts. Finally, it should be noted that including additional rural counties within the current analysis would not appreciably change its impacts.

3. ANALYTICAL METHODS

3.1 The Framework for the Current Analysis

The current analysis is designed to estimate the economic impacts of available aviation access across the five county region defined in Section 2. Specific areas of inquiry include –

- Regional Visitor Expenditures
- Facilities Operations
- Regional Aircraft Maintenance
- Air Express and Air Cargo Operations
- Military Operations
- Ancillary Regional Values

Methods and data related to each of these areas are discussed individually in the text that follows. However, the general analytical pattern was the same for each. The CTR study team, with the assistance of MKAA personnel gathered as much primary information as possible, given study resources. These data were then combined with secondary data to develop necessary modeling inputs. In the case of the first five impact categories the CTR data was used as the direct impact input into economic regional simulations. In the case of "Ancillary" impacts alternative methods were used. Simulations were based on the application of modeling software available through IMPLAN, Inc. and reflect current economic and demographic conditions within the five study region counties.[4]

Each analytical step required a variety of judgments and assumptions regarding regional conditions. At every such juncture, the study team attempted to err toward the conservative, so that represented values reflect a minimum plausible level of economic activity.

3.2 Simulation Model Inputs

Regional Visitor Expenditures Identifying the direct expenditures attributable to the appropriate number of regional visitors require two analytical steps. First, it was necessary to parse McGhee Tyson passenger data into local vs. non-local travelers. Second it was necessary to assign a per-visitor expenditure value to each non-resident traveler. Further, while it was not required, the study team attempted to determine what proportion of the aggregate visitor expenditures occur either on or near the field.

Estimates identifying local versus non-local TYS passengers were based on two data sources provided by MKAA. The first of these provided total passenger enplanements and deplanements on a monthly basis. The second provided data on specific enplanement destinations. Absent any compelling reason to expect otherwise, the proportion of local and non-local passengers for each destination was assumed to be equal. There were, however, 15 destination cities – mostly

[4] IMPLAN is a product name under license to the Minnesota IMPLAN Group, Inc., Stillwater, Minnesota. Further product descriptions are available at http://implan.com

tourist destinations – where we strongly suspect local traffic dominates the passenger mix. In these cases, we assume that 70 percent of passengers were local and 30 percent were non-local.[5] Thus, of the roughly 860 thousand 2010 TYS (round trip) passengers, we estimated that 366 thousand (42 percent) were non-local travelers, while the balance were area residents leaving and returning to the area.[6]

The stay-related expenditures for non-local travelers passing through TYS represent a high level of aggregation across a group of travelers with widely varied trip characteristics. To determine the appropriate value, we relied on earlier information developed by the University of Tennessee's Tourism Institute in a separate 2010 MKAA-sponsored study. This study included average party size and average party expenditure data for visits to five East Tennessee destinations. By excluding obvious tourist-only destinations, the CTR study team arrived at an average per-trip visitor expenditure of $411. The combination of the visitor and expenditure data yields 2010 estimated total visitor expenditures of $150.5 million.

On-Field and Near-Field Visitor Expenditures The visitor expenditures described above account for all regional visitor expenditures included in the simulations. Thus, they subsume any sub-regional calculations. Nonetheless, these more disaggregated calculations are sometimes of interest and are, therefore, noted here.

The area along US 129 to the east of TYS contains a variety of lodging and eating establishments. Data describing the capacity of these restaurants and hotels was combined with average occupancy and expenditure data for Blount County to estimate the magnitude of near-field expenditures. Lodging and eating establishments combined, equaled roughly $22 million for 2010. Additionally, per enplanement expenditure data from a number of US commercially-served airports were combined to estimate revenues for on-field vendors. These totaled approximately $4 million for 2010. Consequently, we estimate that at least $26 million (17 percent) of the direct regional total visitor-related expenditures are associated with on-field or near-field services.[7]

[5] Varying this assumed local / non-local ratio has very little influence on the estimated impact values.

[6] One might argue that area visitors who could not travel to the region would do so by other means. However, the available statistics suggest otherwise. Only slightly more than 16 percent of TYS arriving passengers come from origins that are less than 1,000 miles from Knoxville and less than two percent of arriving passengers come from origins of less than 500 miles. Given these data, it seems unlikely that a substantial portion of dissuaded airline passengers would drive to the region instead. Moreover, for the small number that might choose to do so, it is likely that their alternative transportation choice would shorten their stay and stay-related expenditures.

[7] This value does not include expenditures for vehicle rentals or gasoline purchases. In the case of rental cars, adequate vendor data were not available. For area gasoline sales it is impossible to reliably segregate local from non-local traffic.

MKAA, TSA, and FAA Activities The IMPLAN software used to simulate the region-wide impacts of direct airport-related economic activity will accept input values by industry that are based on either annual sales or employment. In the case of airport personnel, the MKAA supplied all needed data. Similar data were supplied by the TSA and FAA.

Airline Operations Two of the eight commercial passenger carriers serving Knoxville provided employee and wage information. Data from these carriers was used to construct representative wage and employment profiles on a per-flight basis. The per-flight values were then combined with carrier-specific flight frequencies to develop estimated annual wage and employment values for all eight airlines.

Airline Maintenance Continental Express has operated an aircraft maintenance facility at TYS for nearly a decade, providing reliable employment for approximately 100 workers. Information characterizing occupation mix and average salaries was combined with the number of employees to estimate the annual payroll for this facility.

General Aviation Tac-Air, the fixed base operator (FBO) at TYS provided information on employment wages and fuel sales. These data were combined with data describing annual operations to estimate similar values for general aviation services at DKX.

Military and Military-Related Activity The Air National Guard's 134th Air Fueling Wing is based at McGhee Tyson and is a major source of both aircraft and economic activity on and near the field. Data describing both military and civilian employment and compensation was supplied by the Air Guard for use within the current analysis.

Data elements based on the methods described above are summarized in Table 3-1.[8]

Table 3-1
Simulation Input Data Summary

Data Element	Value
TYS Emplaned and Deplaned Passengers	1,691,000
Airline-Served Non-Resident Area Visitors	366,000
Average In-Region Visitor Expenditure	$411
Total In-Region Visitor Expenditures	$151 Million
Air Freight / Express (Pounds Emplaned, Deplaned)	93,393,658
General Aviation Operations (TYS, DKX Combined)	171,000
Transportation, Service Sector, Military Employment	2,870 (FTE)
Transportation Service Sector, Military Incomes (Annual)	$158 Million

[8] The confidentiality of respondents to MKAA data requests prevents the publication of further disaagregations.

3.3 Ancillary Regional Impacts

The total impacts developed through the economic simulations are reported in Section 4. However, these impacts represent only a portion of the total regional economic influence of operations at TYS and DKX. There are significant other impacts (many of them actual benefits) that are not captured by the processes outlined so far. For the remainder of the document, these are referred to as "ancillary" impacts.

The additional impacts included within the this category have many sources – some that are readily measurable and some that are not. For example, local passengers who fly commercially to and from TYS can often achieve lower fares from other commercially served airports. The difference between the fares they pay to and from TYS and any lower fares obtainable elsewhere is a good measure of the additional utility these travelers derive because of Knoxville's service availability. Moreover, these values represent the *minimum* value of these benefits – the portion of the benefits revealed by their willingness to accept higher local fares.

In addition to these, more or less calculable impacts, business interests and citizens, alike, benefit to some degree from simple access to commercial aviation even if they do not avail themselves of it during the period for which data are drawn. In a similar way, a broad range of both actual and potential users benefit from available general aviation at both TYS and DKX.

In the absence of rather extensive user and general population surveys that capture these ancillary benefits, measuring them is extraordinarily difficult. A meta-analysis of studies where these extensive surveys have been used suggests that results generally range between one-half and one percent of total value added within the study region. In the case of the current study, one-half of one percent of total value added equals roughly $154 million annually.[9] This is the figure that is reported for ancillary impacts within the summary of Section 4 results.

To add credibility to this estimate of ancillary impacts, the discernable portion attributable to local traveler use of commercial services via TYS was calculated based on that use and a comparison of the airfares currently available at TYS and similar fares for flights to and from Nashville International Airport (BNA).[10] Fare differentials were calculated for 20 origin/destination cities. The average "best available" fare differential for flights with fairly typical characteristics averaged $103 across the resulting city pairs. When this value is applied to the approximately 495 thousand 2010 local passengers, the product is over $51 million annually or roughly one-third the total assumed for ancillary values.[11]

---

[9] *Value added* is the economic measure used to develop commonly discussed depictions of economic activity like Gross Domestic Product (GDP) or Gross State Product (GSP). In fact the current estimate of regional value added was derived by apportioning Tennessee's GSP based on county populations.

[10] Area travelers sometimes also opt for alternative travel to and from Atlanta's Hartsfield-Jackson International (ATL). However, within the current inquiry, the study team was only able to select one alternative and Nashville was chosen because (1) it is roughly 40 miles closer than Atlanta and (2) fares to and from Nashville include the influence of Southwest Airlines, whereas, Atlanta's do not.

[11] An alternative back-of-envelope method is to value passenger vehicle travel time at $100 per hour (this includes vehicle costs). The substitution of this rule-of-thumb method yields TYS local traveler benefits of as much as $139 million or 90 percent of the assumed ancillary impacts.

4. ESTIMATION RESULTS

4.1 IMPLAN Simulation Results

IMPLAN estimates of indirect, induced, and total regional economic impacts based on the Section 3 methodology are reported in Tables 4-1 – 4-3.

Table 4-1
IMPLAN Simulation Impacts - Employment

Sector	Direct Impacts	Indirect and Induced Impacts	TOTAL Simulated Impacts
Agriculture	----	31	31
Mining	----	19	19
Construction[12]	----	----	----
Transportation, Communications, and Public Utilities	1,093	640	1,733
Manufacturing	----	84	83
Trade	----	77	77
Finance, Insurance, and Real Estate	----	147	147
Services and Government	1,778	762	2,540
TOTAL	**2,871**	**1,760**	**4,630**

Table 4-2
IMPLAN Simulation Impacts – Incomes (X $1,000)

Sector	Direct Impacts	Indirect and Induced Impacts	TOTAL Simulated Impacts
Agriculture	----	188	188
Mining	----	769	769
Construction	----	7	7
Transportation, Communications, and Public Utilities	35,213	25,374	60,586
Manufacturing	0	4,446	4,446
Trade	----	3,036	3,036
Finance, Insurance, and Real Estate	----	4,634	4,634
Services and Government	122,791	21,641	144,432
TOTAL	**158,004**	**60,096**	**218,100**

[12] In order to be conservative, the current analysis is focused on the ongoing, "permanent" impacts associated with aviation access. Therefore the simulations did not reflect the transitory influence of airport-related capital expenditures. Nonetheless, these expenditures are, in some years, non-trivial, so that in addition to the impacts reported here, MKAA activities are sometimes a significant source of regional construction activity.

Table 4-3
IMPLAN Simulation Impacts – Output (X $1,000)[13]

Sector	Direct Impacts	Indirect and Induced Impacts	TOTAL Simulated Impacts
Agriculture	----	1,382	1,382
Mining	----	1,916	1,916
Construction	----	105	105
Transportation, Communications, and Public Utilities	122,264	80,135	202,399
Manufacturing	----	8,798	8,798
Trade	----	6,340	6,340
Finance, Insurance, and Real Estate	----	13,787	13,787
Services and Government	156,671	70,411	227,083
TOTAL	**278,935**	**182,874**	**461,809**

There is nothing particularly remarkable in these results. The direct impacts are exclusively within the transportation and services (including government) sectors. As the impacts of the direct transactions feed through the broader regional economy they spread to other commercial sectors – most notably finance-rated industries. The average annual wage of $47 thousand is relatively high. However, it should be noted that this figure includes all associated benefits and is also noticeably influenced by the inclusion of military salaries. The output multiplier that results from the estimation equals 1.7, a relatively low value. This suggests that, given the nature of the activities directly related to the airport and the characteristics of the regional economy, a fairly large amount of "leakage" occurs early in the sequential process described in Section 2.

4.2 Related Fiscal Impacts

A rigorous and geographically disaggregated estimate of the county sales tax and property tax revenues or a complete estimate of similar state tax revenues is beyond the scope of the current analysis. However, as a simple reference or starting point, the figures in Table 4-4 are calculated based on effective tax rates in each jurisdiction.[14] These values are further apportioned based on relative county populations. Because of the near-field, visitor-related commerce described above, the current methodology probably overstates the tax revenue importance of airport activities to Knox County and understates this importance to Blount County revenues.

[13] Output equals total annual sales within the five county study region.

[14] Effective tax rates are defined as total annual collections divided by total household incomes in each jurisdiction.

Table 4-4
Roughly Estimated Tax Revenues

Jurisdiction	Property and Local Option Sales Tax	State Sales Tax
Anderson	880,612	
Blount	1,433,913	
Knox	5,084,021	
Loudon	542,129	
Sevier	1,001,408	
TENNESSEE TOTAL	**8,942,083**	**10,686,879**

4.3 Summary of Estimated Economic Impacts

A variety of methods, described above, were used to estimate the economic impacts associated with the availability of aviation through the Knoxville region's McGhee Tyson Regional Airport (TYS) and its Downtown Island Airport (DKX). These estimates suggest that, within a five county study area, these facilities are directly or indirectly responsible for **4,630** jobs that pay roughly **$218 million** in annual incomes and benefits. Regionally, activity attributable to airport access leads to the production of goods, services, or other value that are estimated at **$616 million** annually. Aviation activity also leads to roughly **$10 million** each in local and state tax collections each year. Finally, looking from today toward the future and ignoring the almost certain growth in aviation's importance, the present value of foreseeable activity over a reasonable time horizon is roughly **$10 billion**.

5. LOOKING TOWARD THE FUTURE

5.1 Framing the Discussion

As the previous sections document, aviation access is an important element that helps define the Knoxville region's economic landscape. By most measures, the magnitude, nature, and use of this access are consistent with similarly situated regions in other parts of the US. If any distinctions are to be made, they would suggest that the carrier mix, number of flights, available destinations, and overall use are slightly better in the Knoxville region than might be expected given the regional population, level of economic activity, and availability of transportation alternatives. If there are unrealized opportunities for economic growth associated with the airport, they likely lie in the commercial interface with regional commerce.

Maintaining and expanding the success at TYS is the responsibility of the MKAA and the management team it employs. Certainly, the CTR has neither the expertise nor the desire to offer advice in this regard. MKAA forecasts (summarized below) of the future airline industry characteristics and McGhee Tyson's likely role within that setting appear to be exceedingly well developed, so that there is every reason to trust the Airport Authority's strategies for meeting this forecasted future. Similarly, the Airport Authority and its management are poised to take advantage of potential non-passenger-related opportunities. The ability to accomplish this would seem to rest in the future coordination of on-field airport facility development with other regional planning efforts.

The remainder of the current section addresses three tasks. The first is to very briefly characterize ongoing changes in the commercial aviation industry with specific attention to their implications for TYS. The second is to loosely evaluate on-field and near-field facilities and development opportunities with an eye toward additional coordinated planning. The final task is to provide a very preliminary assessment of the potential economic rewards to aviation-related economic development.

5.2 Aviation – The Local Implications of Global Change

Since the airline industry's deregulation in 1978, there has been an ever-accelerating sequence of change. Over the intervening years, airline passengers have evidenced a tireless preference for lower fares over any and all other service attributes. "Legacy" carriers have merged and merged again or simply disappeared. Hub-and-spoke routings evolved then subsequently declined among main-line carriers. New market entrants of every form have appeared, prospered, struggled, and often exited countless markets, large and small. And express-driven air cargo has emerged as an important source of airfield activity. All of this has occurred in an environment that was forever shaken in 2001 when three (of four) hijacked passenger jetliners were used as weapons against landside targets.

For the most part, airport terminal management teams have been left to respond to these changes with little capacity to actually affect them. Flexibility has become essential. Reduced operations by main-line carriers have left some concourses at major airports abandoned, while

smaller, more numerous regional aircraft clog ground operations and regional passengers mob often undersized terminals. Ticketing areas have been compressed or converted to accommodate increased security needs and these same needs have radically altered landside motor vehicle flows and available parking alternatives. And, save for cyclical and seasonal changes, the number of passengers continues to grow.

Not only are airport managers and the jurisdictions that govern them expected to cope with immediate challenges, they must anticipate the future in order to design facilities that will not be built for years, but which are expected to function for decades. In facing this requirement, the MKAA is no different than its counterparts across the US. Accordingly, in 2006 the Knoxville region's airport authority finalized and released an updated "Master Plan" that provides specific forecasts detailing how these unfolding industry changes, combined with regional development are expected to impact required capacity at TYS. A few of the more salient points underscored by these forecasts include –

- Low-fare and regional carriers will continue to replace main-line, legacy service in most markets relevant to TYS passengers;
- The dominance of Southwest Airlines (SWA) as the low-fare carrier will continue to erode as other low-cost carriers mature and learn to compete more effectively;
- Hub and spoke route systems will continue to diminish in importance; and
- Apart from occasional short-run disruptions traffic and capacity needs at TYS will closely parallel the economic condition of the regi,on.

5.3 McGhee Tyson – Airport, On-Field, and Near-Field Facilities

The 2006 Master Plan combines various forecasts with an assessment of airport facilities in order to forecast and prioritize future needs. Again, the full document provides a great deal of detail that is summarized only briefly here. This summary is divided into three groupings – **(1)** runways, taxiways, ramps, and control facilities; **(2)** airport terminal, parking, and landside access; and **(3)** on-field support facilities and developable property.

Runways, taxiways, Ramps, and Control Facilities With some modest exceptions, the facilities that actually accommodate aircraft operations are more than adequate for both current and foreseeable needs. At the time of the Master Plan revisions, actual field capacity utilization was barely greater than 50 percent and was not projected to be fully exhausted over the forecast period that ends in 2024. There are specific issues involving additional "high-speed" taxiways, the proximity of taxiways to some instrument approach patterns, and visibility concerns at the current control tower that may require attention, but these issues can be remedied with relatively modest resources.

Airport Terminal, Parking, and Landside Facilities The current McGhee Tyson terminal structure appears to also be more than adequate to meet foreseeable needs. Future improvements may include improved baggage handling spaces and available gate space is increasingly an issue, but there are no major facility deficits. Unfortunately, the same is not true of surface parking or available parking structures. In spite of relatively recent improvements, there appears to be an ongoing need for additional parking capacity. The Master Plan contains a number of options for the creation of this capacity. However, given the short construction

horizon, a selection among alternatives does not appear to have been made necessary. Off-field landside access also remains as an issue. At the time of the Master Plan's revision, Tennessee's Department of Transportation (TDOT) had just unveiled plans for the construction of a new US 129 alignment that would relocate through traffic to the east of the current roadway between I-140 and Hunt Road. Currently, this proposed improvement is moving through the typical TDOT planning and approval process.

On-Field Support Facilities and Developable Property The Master Plan notes a number of likely improvements to on-field support facilities, including a consolidated airport vehicle storage and maintenance facility and expanded (and potentially above ground) aircraft fuel storage facilities. For purposes of the Master Plan revision, the on-field property currently under MKAA control is divided into 5 areas. These are roughly depicted in Figure 5-1 and briefly described in Table 5-1.

Figure 5-1
Developable Property

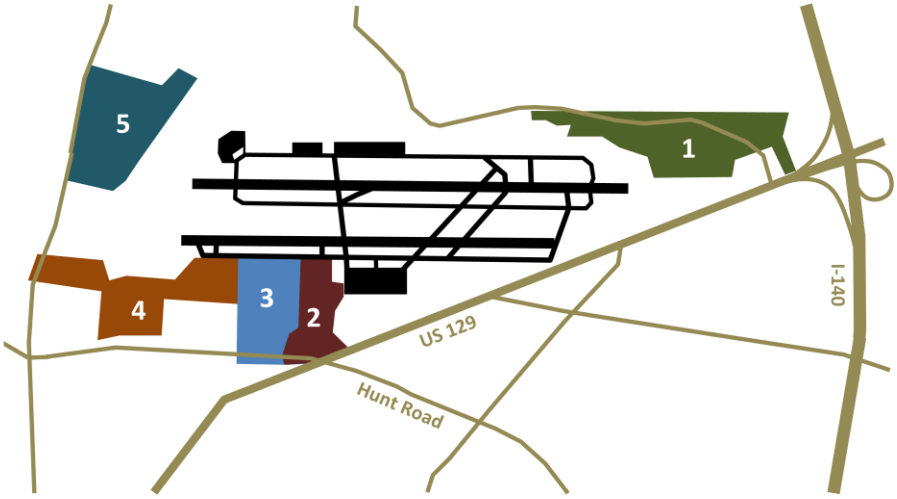


Table 5-1
On-Field Land Use

Area	Acreage	Existing Use	Potential Use
1	210	Air cargo, heavy aircraft maintenance	Expansion of current uses
2	80	Unused, land under development	Air (belly) freight, Airline operations, MKAA operations, parking, lodging, etc.
3	64	Ramp C, otherwise under development	FBO, aircraft maintenance, corporate hangers
4	94	Undeveloped residential buffer	Office, light industrial, retail
5	160[15]	Undeveloped	Medium to heavy industrial that does NOT require direct airport access.

[15] The area has immediate access to rail service via CSX and is adjoined by a 232 acre parcel owned by the Blount County Development Board.

5.4 Additional Airport-Related Economic Development

Airport-related development typically comes in three forms – **(1)** commercial, retail, or residential developments aimed at travelers and airport employees; **(2)** field-dependent services such as air cargo and aircraft maintenance; and **(3)** commercial or (typically light) industrial development that does not require field access, but which benefits from a close proximity to commercial air services. Currently, TYS is associated with all three types of development activity.

Consumer or Residential Development Sections 3 and 4 describe the economic importance of the near-field lodging and restaurant establishments currently operating near McGhee Tyson. Many of these are relatively new and there are additional facilities already planned. Given ongoing economic expansions in Alcoa and Maryville and the potential access relief afforded by improvements to US 129, this form of airport-reliant development should see further growth that is not necessarily dependent on increased passenger traffic at TYS or MKAA involvement.

Field-Dependent Development As noted, TYS is already host to both dedicated air cargo and heavy aircraft maintenance facilities located immediately north and west of the field. Unlike other forms of development, the required field access also necessitates direct airport involvement in development processes. Land control, traffic, security, and other issues abound. It is typically also necessary for the host airport to actively recruit this sort of tenant and to ensure that the specific location is sustainable within the tenant's long-run network plans.

Off-Field Commercial and Industrial Development This is, by far, the most popular form of airport-related development. A wide variety of manufacturers, distributors, and other commercial interests benefit from close proximity to transportation facilities and to each other (clustering). This makes near-field locations ideal. In some cases, airport authorities are active partners in promoting this form of development. Other times, development is undertaken by municipal, regional, or private entities. In either case, the process is generally similar for most industrial, commercial, or tech-park developments. Acquired land is and prepared for use. Potential tenants are recruited to self-build facilities or to lease space in speculatively developed properties. As one portion of the development is populated, additional phases routinely follow.

Two elements are required to pursue this form of development – property that can be affordably placed in commercial and / or industrial use and good landside transportation access, generally meaning highways.[16] There are multiple areas near TYS that provide suitable property. However, the issue of adequate highway access may be more problematic. Planned improvements to US 129 will certainly ease conflicts between local and pass-through airport area traffic and I-140 provides access to westbound I-40 and Oak Ridge. However, vehicle traffic which may be eastbound on I-40, destined for I-75 or en route to metro Knoxville is likely to face considerably more congestion. This issue is of immediate importance.[17]

---

[16] Several locations (for example Charlotte, Columbus, Huntsville, Alliance, Texas (Fort Worth)) have co-located air cargo and truck-rail intermodal facilities. However, even though several developable properties are near main-line CSX trackage, this form of development seems unlikely in east Tennessee.

[17] One need only observe the landside traffic issues near Memphis International (MEM) on US 78 (Lamar Avenue) to appreciate the extent to which airport-related vehicle traffic can collide head-long with land-only freight movements to create untenable congestion.

5.5 Potential Impacts to Additional Airport-Related Development

Nearly every transportation-related development is unique, bringing with it a specific set of requirements, investments, and economic opportunities. Thus, absent a detailed plan, the economic impacts associated with additional economic activity for which McGhee Tyson might be a catalyst can only be described in generalities. This said, even the *potential* outcomes are sufficient in magnitude to warrant attention.

To begin, almost any infrastructure-related development entails construction expenditures and the economic activity that accompanies them. Regional economists are typically dismissive of construction impacts for two reasons. First, they are transitory in nature. When the construction is complete, its economic impact disappears. As importantly, very often both the materials and labor used in industrial / commercial construction is imported from outside the study region. Thus, the local economic impacts are often limited to the on-site spending of workers whose permanent residence is elsewhere.

However, all these concerns notwithstanding, construction expenditures seldom go unnoticed and sometimes both their magnitude and duration produce significant region-wide impacts. For example, the Port of Virginia's inland port facility near Front Royal is directly responsible for nearly $1 billion in related third-party investment over the past 15 years. Thus, the related construction has lasted nearly a generation – certainly long enough for construction labor to relocate to the area.

Next, transportation related economic development often changes the basic character of a regional economy, introducing economic activities that were simply absent before. Generally, transportation is not, by itself, a particularly powerful job generator, but many of the activities that are attracted to efficient transportation are. This is particularly true of light manufacturing and distribution. Moreover, the employment stemming from this sort of commerce is, generally, well compensated. It is not unusual for distribution center employees to begin at an annual salary of between $35 thousand and $40 thousand not including any related employment benefits. Because air cargo does not usually involve volumes that are as great as those associated with surface freight transport, the number of workers required by individual firms is typically smaller. However, this number can still be substantial. One need only look at the manufacturing and distribution incomes generated in the areas surrounding Memphis international to gain some sense of this.

Generally, it is apparent that the MKAA and its management have worked closely with local and regional planning jurisdictions to develop commerce that is consistent with the scale of TYS operations and the greater needs of the region. Moreover, given the availability of developable property that is either near the airport or which has actual field access, further aviation-related development seems possible. Whether or not this is pursued would seem to depend on two factors – the strength of competing alternatives available to an already economically robust area and the extent to which corresponding landside transportation improvements are forthcoming.

6. CONCLUDING THOUGHTS

McGhee Tyson and the Downtown Island airports are long-established landmarks that are tied to Knoxville area history in enumerable ways. These transportation facilities have grown, prospered, struggled, and matured just as the region has – through happy times and through times that were much more difficult. From the oldest resident to the newest arrival, most of us have memories connected to these airports.

From an economic standpoint, aviation access is also an integral part of the region's fabric. Regional commerce simply depends on it. Knoxville's airports provide the connectivity that is increasingly essential in a world of global markets and the rewards for this connectivity are measurable. McGhee Tyson, in particular, is immediately responsible for thousands of jobs and hundreds of millions of dollars in annual incomes and both airports, together, support regional commerce that is valued at well over one-half billion dollars annually. Sustaining this success in an era where airline industry change comes with increasing speed is difficult and mistakes could have been costly. Viewed in this light, the value of the region's aviation leadership and the economic stability it has provided appears even greater.

Along with the challenges, however, have come increased opportunities. Over the past generation, continuous reductions in inflation-adjusted airfares have helped open the region to leisure travelers who would have, otherwise, not visited Southern Appalachia. At the same time airborne freight in the form of containerized express shipping has grown remarkably, providing a set of services that are particularly important to East Tennessee's technology based commerce.

Looking to the future, there are many new questions. Certainly, simply protecting the aviation access we now enjoy will be critical. However, given the relatively rapid economic development in northern Blount County and the physical capacity at and near McGhee Tyson, regional leaders must also determine the extent to which they wish to pursue additional aviation-related commerce. How this question is to be answered is a regional policy question that is sure to occupy a great deal of energy. However, the fact that there are choices to be made is, perhaps, the greatest of all measures of past success.

MLB
December 2011