

TECHNICAL REPORT

2015 KANSAS CITY REGIONAL AVIATION SYSTEM PLAN



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Chapter One: Introduction

About the System Plan

In November 2014, the Mid-America Regional Council (MARC) undertook an update to the Regional Aviation System Plan (RASP) for Greater Kansas City. The study was funded largely with a grant from the Federal Aviation Administration (FAA), with matching funds supplied by both the Kansas and the Missouri Departments of Transportation (KDOT and MoDOT). The system plan was developed following guidance contained in FAA Advisory Circular 150-5070-7, *The Aviation System Planning Process*.

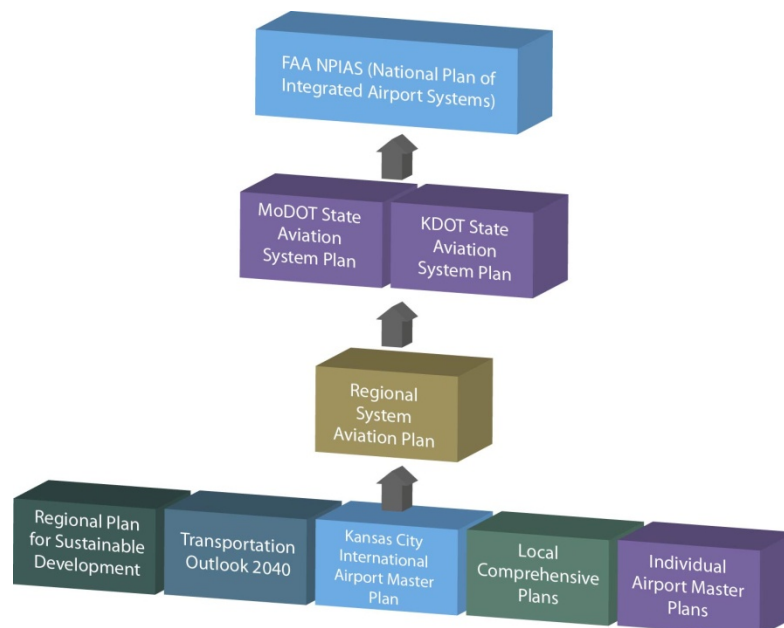
Role of the Regional System Plan

The regional system plan is informed by a number of existing planning efforts. Among these are:

- Regional Plan for Sustainable Development
- Transportation Outlook 2040
- Kansas City International Airport Master Plan
- Local Comprehensive Plans
- Individual Airport Master Plans

Findings and conclusions from the system plan will feed into state aviation system plans for both Kansas and Missouri when these plans are next updated. As appropriate, findings and recommendations from the state system plans feed into the FAA's National Plan of Integrated Airport Systems (NPIAS). Figure 1-1 shows the relationship of the plans that form the building blocks for aviation system plans. The regional system plan is essential to ensuring that airport needs for the study area are appropriately represented in applicable state and national aviation planning studies.

Figure 1-1 - Building Blocks of RASP



Source: Jviation, Inc.

Study Objectives

There were four overarching themes for the regional aviation system plan. These themes are summarized below:

- **Understandability** — Conduct the study in such a way that its methodologies, results, findings and recommendations can be clearly communicated to those outside of the aviation/airport community, especially to local elected officials and the general public.
- **Accessibility** — Focus the study on opportunities to maximize airport accessibility from both the ground and the air.
- **Compatibility** — Provide tools and information that can be used by MARC and airport owners and sponsors to promote airport compatibility with human and natural elements.
- **Sustainability** — Establish a baseline for identifying practices in place to support sustainability (economic, environmental, and social) and a method to measure sustainability progress in future planning cycles.

These themes guided the development of the scope of services for the system plan and run throughout the various technical elements of the study. These themes are directly related to goals for creating a more vibrant, connected and sustainable region.

Several key objectives were identified for undertaking an update to the system plan. These objectives are as follows:

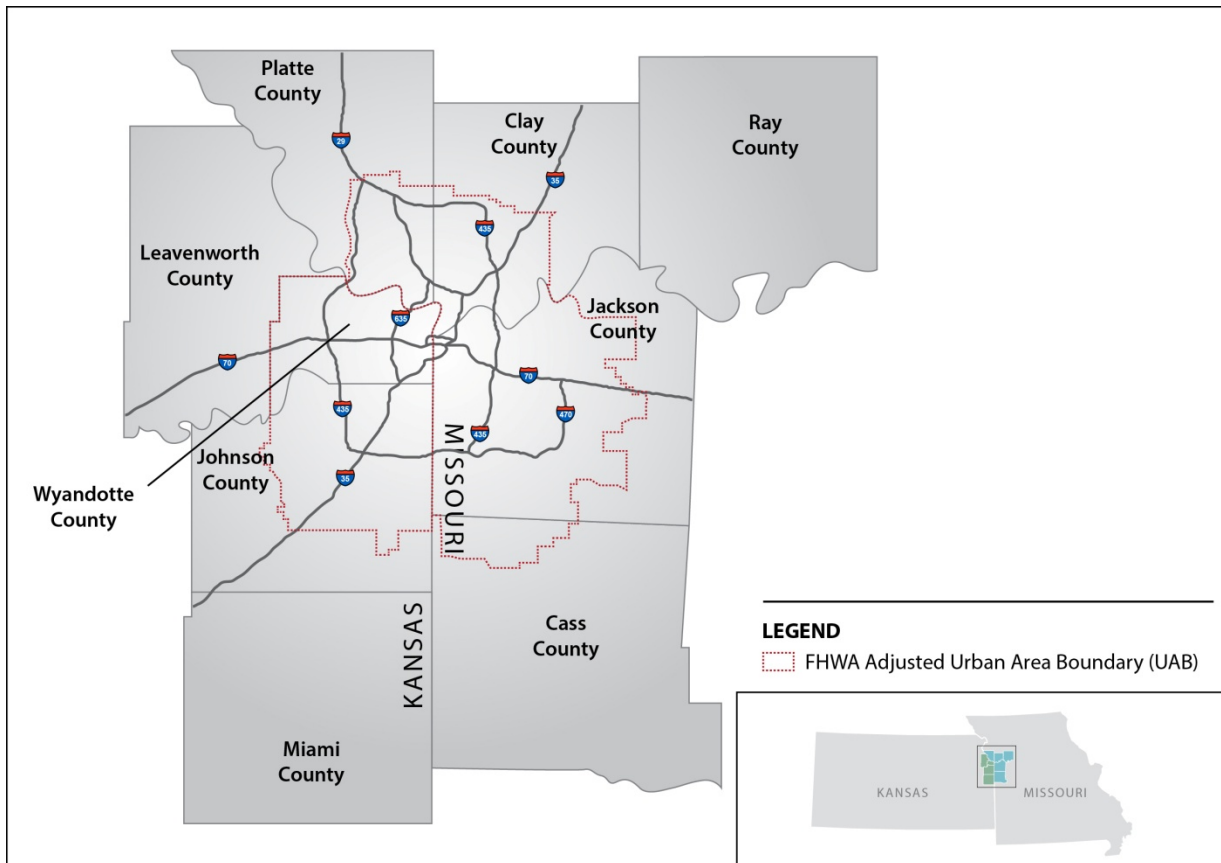
- To provide a bridge between regional aviation needs and priorities and statewide aviation system plans for all public airports in both Kansas and Missouri.
- To evaluate the adequacy of the region's public-use airports using factors similar to those used to evaluate the performance of other transportation modes. This included establishing an evaluation process that could be updated in subsequent planning cycles.
- To gather information on users of study airports and on benefits that communities in the MARC study area receive from those same airports.
- To help MARC strengthen its role as a communicator and a facilitator for study airports with agencies such as FAA, KDOT and MoDOT. One of MARC's goals is to advocate for the region's needs on the state and federal level.
- To provide tools and information to study airports that they otherwise would not have access to. Further, an important system plan objective was to provide value-added information and products that study airports may not have been able to develop with their own resources.
- Ultimately, the system plan may be used to update or inform the Aviation Chapter of the Greater Kansas City's metropolitan transportation plan.

These stated objectives were considered as the work plan for the system plan was developed. Technical elements of the system plan and various study products help to ensure that the system plan objectives identified here are met.

Study Area and Study Airports

MARC is the association of local governments and metropolitan planning organization (MPO) for the bi-state Kansas City region shown in Figure 1-2. Governed by a board of local elected officials, MARC serves nine counties and 119 cities, providing a forum for the region to work together to advance social, economic and environmental progress. As the MPO, one of MARC’s responsibilities is to help the region anticipate and adapt to changing transportation needs. The region’s transportation planning boundary —the area in which metropolitan transportation planning processes must be carried out according to federal statute — includes only eight of the nine counties shown below; Ray County is not part of the transportation planning area.

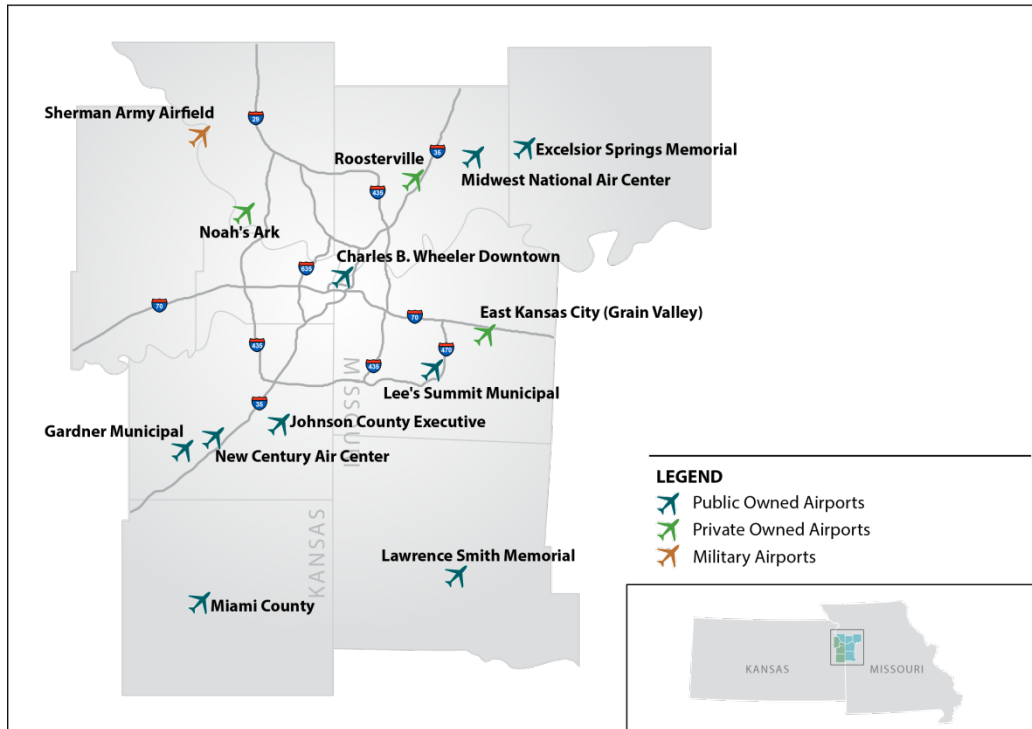
Figure 1-2 - RASP Study Area



Source: Jviation, Inc.

The nine-county MARC study area and the public-use airports that are included in the update to the regional system plan are shown in Figure 1-3. The location of all study airports and the highways serving the study area are also shown in Figure 1-3.

Figure 1-3 – Location of Study Airports



Source: Jviation, Inc.

Airports included in the system plan are listed in Table 1-1. These airports are referred to in the system plan as “study airports.” This table also provides information on airport ownership. A majority of the study airports are publicly-owned, most often by a city or county; however, some of the study airports are privately-owned. One exception is the Sherman Army Airfield, as it is owned by the U.S. Department of Defense; this airport is a joint-use civilian and military airfield. Table 1-1 also provides each airport’s three letter/number identifier as assigned by the FAA.

Table 1-1 – Regional Aviation System Plan Airports

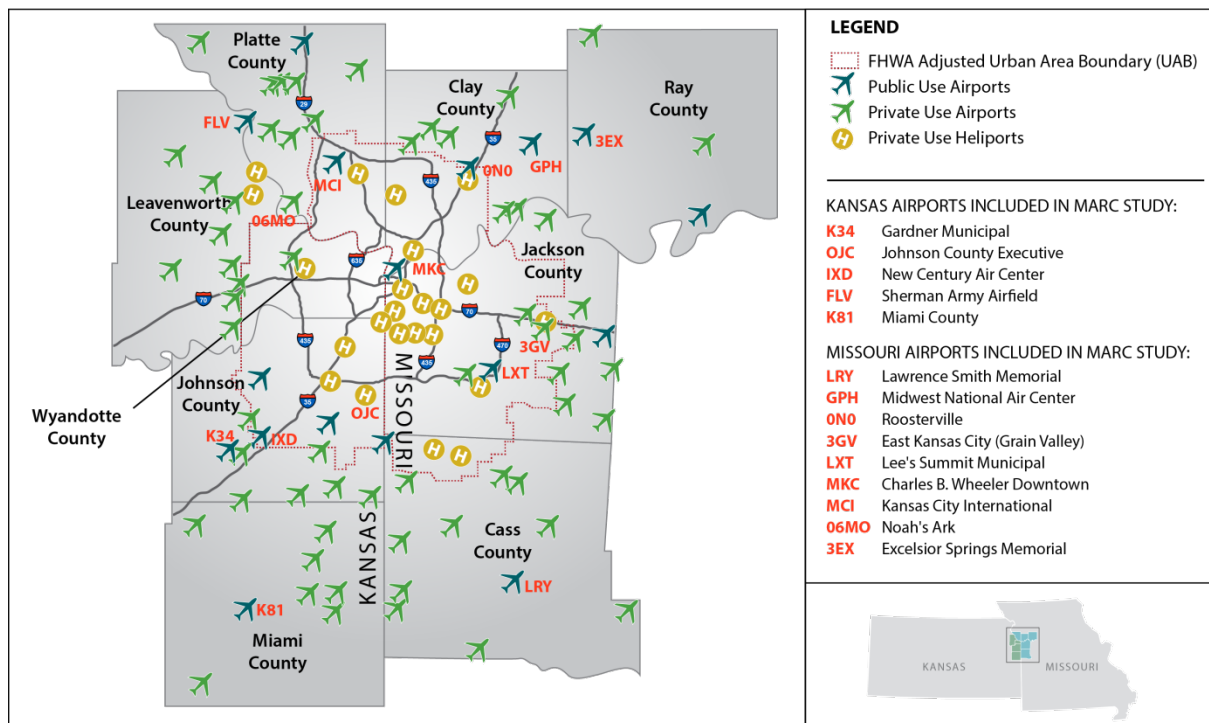
Airport	FAA Identifier	Location	Ownership
Charles B. Wheeler Downtown	MKC	Kansas City, MO	Public
East Kansas City	3GV	Grain Valley, MO	Private
Excelsior Springs Memorial	3EX	Excelsior Springs, MO	Public
Gardner Municipal	K34	Gardner, KS	Public
Johnson County Executive	OJC	Olathe, KS	Public
Kansas City International	MCI	Kansas City, MO	Public
Lawrence Smith Memorial	LRV	Harrisonville, MO	Public
Lee's Summit Municipal	LXT	Lee's Summit, MO	Public
Miami County	K81	Paola, KS	Public
Midwest National Air Center	GPH	Mosby, MO	Public
New Century Air Center	IXD	Olathe, KS	Public
Noah's Ark	06MO	Waldron, MO	Private
Roosterville	0N0	Liberty, MO	Private
Sherman Army Airfield	FLV	Leavenworth, KS	Military

Source: Airport Management records, FAA 5010 Reports.

Airports identified for inclusion in the system plan update have generally been included in past updates to the regional aviation system plan for the Kansas City area. In addition, the airports included in the system plan are also included, for the most part, in either the Kansas or the Missouri State Aviation System Plan. There are, however, a few exceptions. Cedar Air Park in Johnson County, Kansas is included in the Kansas State Aviation System Plan, but it is not included in this regional system plan. This is a low activity-level airport with only four reported based aircraft, according to FAA Form 5010. Following FAA’s rule of thumb for airports of significance, the airport should have 10 or more based aircraft. Based on this guidance, Cedar Air Park is not included in the regional system plan, but privately-owned Noah’s Ark in Platte County, Missouri, with 42 based aircraft and privately-owned Roosterville in Clay County, Missouri, with 65 based aircraft are both included in the regional system plan. Neither of these two airports are included in Missouri’s current state airport system plan.

It is worth noting that in addition to the airports included in the system plan, there are other airports in the nine-county study area. Almost exclusively, these additional airports are privately-owned, private-use airports or heliports that are not open to the public. Figure 1-4 shows the general location of these privately-owned private use facilities in the nine-county area. It is worth noting that privately-owned, private use airport frequently close, while others open. Current information on the location of privately-owned, private use airports and heliports in the study area is best obtained from FAA.

Figure 1-4 - Airports and Heliports in Nine-County Area



Source: MARC

Study Elements

The following elements are included in the regional system plan:

- Inventory
- Future Demand
- Airport Roles
- Current System Performance
- Strategies to Enhance System Performance
- Airport Actions
- Costs
- Implementation Tools
- Documentation
- Outreach

Findings, conclusions and recommendations from the regional system plan are documented in both a technical and an executive summary report. In addition, to provide value to study airports, a number of specific tools will be provided to each airport. These tools will help airports implement study recommendations, thereby helping to improve overall system performance. Airport-specific reports and tools resulting from the system plan will include:

- Airport-specific system summary.
- Access overview.
- Environmental features.
- Land use/local jurisdiction reference map.

Outreach and educational efforts are an important underpinning to the success of the regional system plan. A Project Steering Committee provided guidance during the plan's development. This committee met on several occasions over the study's 12-month timeframe. The Steering Committee represented various airports and other aviation and planning interests in the study area. FAA, MoDOT, and KDOT representatives also were included on the Steering Committee. In addition to the Steering Committee, the system plan was supported by other communication, outreach and educational efforts. These efforts provided an opportunity to reach out to others in the study area, including local elected officials and the general public. Outreach for the system plan was accomplished using each of the following:

- Airport and MARC websites
- Social media
- Newspaper articles
- Online user survey
- Public open houses

Subsequent chapters in this document provide information on methodologies used to conduct the system plan and on the study's findings and recommendations.

Chapter Two: Inventory

Introduction

The inventory identified existing facilities and conditions at the airports included in the Kansas City Regional Aviation System Plan. The data collected during the inventory process is used throughout the study to complete various evaluations and to formulate final study recommendations. Information gathered during the inventory is used to project future demand, determine the adequacy of current system performance, identify facility and service improvements, and develop future recommendations for the system. Data summarized in this chapter includes a description of current conditions as they relate to:

- Aviation activity — based aircraft and annual operations for all study airports
- Airside facilities — runways and taxiways
- Navigational, approach, and landing aids — facilities that support airport usage during periods of reduced visibility or at night
- Landside facilities — aircraft storage hangars, aircraft parking spaces and auto parking areas.

Data Collection Process

The inventory collected information from 13 general aviation airports. For some factors, data was also requested from Kansas City International Airport. These airports are referred to in this report as “study airports.” Inventory information was collected from several sources through a variety of means. Data was collected using survey/questionnaires, on-site visits, interviews and secondary sources. A facility, service and activity questionnaire was mailed to each airport to begin the inventory process. This questionnaire asked for information regarding runways, taxiways, airport visual aids, weather reporting/communication systems, services, hangar space/tie-down/aircraft parking, based aircraft, and aircraft operations. These questionnaires were pre-populated with data from resources such as:

- Federal Aviation Administration (FAA) Form 5010, Airport Master Record
- FAA Airport/Facilities Directory
- AirNav.com
- Airport Master Plans
- Airport Layout Plans (ALP)
- The Missouri Department of Transportation, Multimodal Operations Division, Aviation Section’s State Aviation System Plan
- Kansas Department of Transportation, Division of Aviation’s State Airport System Plan

The questionnaires requested each airport to review all pre-populated information, fill in any blanks in the questionnaire, and make changes to pre-populated data as needed. On-site visits were then arranged to review the information. These visits also focused on gathering additional data required for the remainder of the study. The on-site visits included interviews with various airport representatives such as airport managers, Fixed Base Operator (FBO) personnel, other airport tenants, airport board members, and other airport sponsor representatives.

Existing System

The existing system includes 14 airports, of which 10 are publicly-owned and four are privately-owned. The study airports are depicted in Table 2-1. Kansas City International is the only commercial service airport, while the other 13 airports are all general aviation (GA) airports. Some study airports are also included in the FAA’s National Plan of Integrated Airport Systems (NPIAS). Airports included in the NPIAS are eligible to compete for federal grants from the FAA. Study airports included in the NPIAS, as shown in Table 2-1, are designated as follows: RL = Reliever Airport, GA = General Aviation Airport, and PR = Primary Commercial Service Airport. Reliever airports are also general aviation airports but are designated to help serve operations that might otherwise be served at a commercial airport.

Table 2-1 – Greater Kansas City Regional Aviation System Plan Airports

Airport	Location	Ownership	NPIAS
Charles B. Wheeler Downtown	Kansas City, MO	Public	RL
East Kansas City	Grain Valley, MO	Private	Non-NPIAS
Excelsior Springs Memorial	Excelsior Springs, MO	Public	Non-NPIAS
Gardner Municipal	Gardner, KS	Public	GA
Johnson County Executive	Olathe, KS	Public	RL
Kansas City International	Kansas City, MO	Public	PR
Lawrence Smith Memorial	Harrisonville, MO	Public	GA
Lee's Summit Municipal	Lee's Summit, MO	Public	RL
Miami County	Paola, KS	Public	GA
Midwest National Air Center	Mosby, MO	Public	GA
New Century Air Center	Olathe, KS	Public	RL
Noah's Ark	Waldron, MO	Private	Non-NPIAS
Roosterville	Liberty, MO	Private	Non-NPIAS
Sherman Army Airfield	Leavenworth, KS	Military	Non-NPIAS

Source: Airport Management records, FAA 5010 Reports.

Aviation Activity and Based Aircraft

Aviation activity and based aircraft data were collected for each airport through a variety of sources including this study’s inventory questionnaire, FAA 5010 Master Record Data, and the on-site visits/interviews.

Aviation Activity – Operations

Annual operational data for each airport can be found in Table 2-2. Total operations shown in this table represent both take-offs and landings. Typically, when airport operations are discussed in other parts of this report, an operation represents one take-off or one landing. Annual operational activity for each airport is reported in terms of local, itinerant, air taxi, military and total operations. A short description of each operational category follows:

- **Local Operations** — According to FAA definition, an aircraft operation which is considered to be local in nature takes place within sight of the airfield. Local operations are often associated with training activity and are most often performed by aircraft that are based or permanently stored at that airport.
- **Itinerant Operations** — These operations are associated with both based and visiting aircraft. Operations that are classified as itinerant in nature either have a destination that is another airport

(if the aircraft is based at the airport) or the operation originates from another airport. Visiting aircraft operations in the itinerant category are also referred to as transient operations.

- **Air Taxi Operations** — Operations in this category are most often attributed to carriers that are certified to fly under Part 135 or Part 139. Often the operations of companies such as Executive AirShare that provide on-demand service are included in this operational category.
- **Military Operations** — Operations in this category are attributable to non-civilian aircraft that use study airports. Military aircraft that operate at study airports are most often on some type of training activity and stop at study airports for fuel or other services.

Four study airports (Charles B. Wheeler Downtown, Kansas City International, Johnson County, and New Century Air Center) have Air Traffic Control Towers (ATCTs). Air traffic control towers provide a more accurate count of take-offs and landings at these study airports. At the other non-controlled airports, operations are the best estimates of annual activity, based on airport representatives' experience and knowledge of their airport's activity.

Table 2-2 – Current Estimated Airport Operations

Airport	Local	Itinerant	Air Taxi	Military	Total
Charles B. Wheeler Downtown	14,332	40,565	14,284	1,044	70,225
East Kansas City	7,880	2,800	1,200	120	12,000
Excelsior Springs Memorial	2,400	1,600	0	20	4,020
Gardner Municipal	18,200	7,800	0	0	26,000
Johnson County Executive	19,031	29,819	495	198	49,543
Kansas City International	0	3,613	24,189	810	28,612
Lawrence Smith Memorial	5,000	2,000	25	30	7,055
Lee's Summit Municipal	33,350	14,950	1,725	518	50,543
Miami County	6,200	3,700	0	100	10,000
Midwest National Air Center	7,990	3,040	1,020	8	12,058
New Century Air Center	18,795	20,370	2,245	2,501	43,911
Noah's Ark	7,300	0	0	0	7,300
Roosterville	3,000	500	0	0	3,500
Sherman Army Airfield	9,200	9,200	0	1,300	19,700
Total	152,678	139,957	45,183	6,649	344,467

Source: Airport management records, FAA 5010 Reports, FAA ATADS tower counts.

Note: An operation is defined as *either* a take-off or a landing.

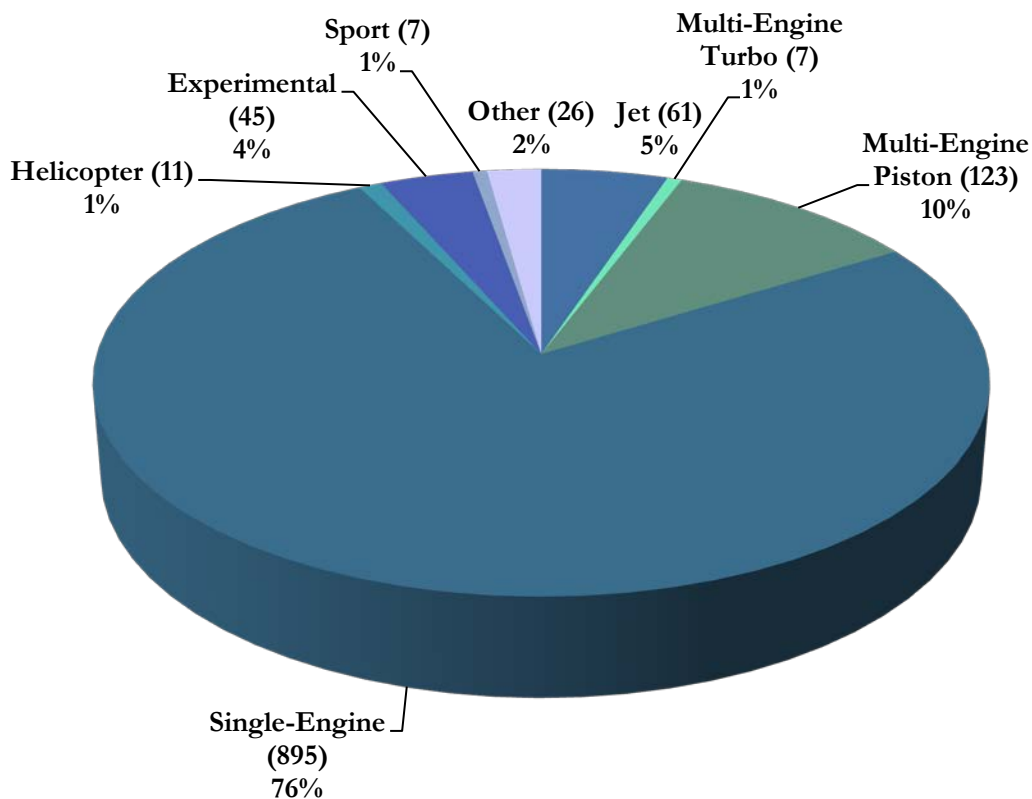
Based Aircraft

Based aircraft represent aircraft that are permanently stored at each airport. Storage for based aircraft is typically distributed between hangars and tie-down spaces on a ramp area. Beginning in 2007, FAA undertook a more stringent program for airports to report their individual numbers of based aircraft. FAA implemented this program to actually record and report based aircraft by “N” number. The program was needed because multiple airports were recording the same aircraft as being based at their airport. When this program was implemented, the number of based aircraft reported at airports within the U.S. showed a decrease. In reality, the based fleet did not shrink, but with the elimination of double and triple counting of the same aircraft, the number of reported aircraft in the fleet showed contraction.

Based aircraft by type for each study airport are reported in Table 2-3. As this table reflects, the majority of the based aircraft at study airports are in the single-engine piston category. Figure 2-1 graphically depicts the distribution of based aircraft at all study airports by aircraft type.

An emerging type of aircraft is collectively referred to as UAS (unmanned aerial systems). At this point, the FAA is still engaged in rule-making for these vehicles. UAS can range in size from a vehicle that has a wingspan of a Boeing 737 to less than one pound. Currently, UAS cannot operate in Class B airspace, which is the type of airspace that characterizes the Kansas City metropolitan area. A certificate of authorization (COA) is required to operate a UAS. For a UAS to operate at a public airport, the airport would have to have a COA. The airport would need to be closed for other types of conventional aircraft operations during UAS operations. At this time, UAS are not expected to impact operations or facility needs at study airports.

Figure 2-1 – Distribution of Based Aircraft by Type



*1,178 Total Based Aircraft

Table 2-3 – Current Based Aircraft by Type

Airport	Jet	ME Turbo	ME Piston	SE	Heli	Expmt.	Sport	Other*	Total
Charles B. Wheeler Downtown	53	**0	63	115	6	0	0	0	237
East Kansas City	0	0	15	185	1	0	0	0	201
Excelsior Springs Memorial	0	0	1	16	0	0	0	1	18
Gardner Municipal	0	0	2	88	0	10	0	4	104
Johnson County Executive	2	3	10	97	1	0	0	0	113
Kansas City International	3	0	0	0	0	0	0	0	3
Lawrence Smith Memorial	0	0	2	25	1	0	6	0	34
Lee's Summit Municipal	2	2	10	102	1	33	1	1	152
Miami County	0	0	0	22	0	2	0	0	24
Midwest National Air Center	3	0	9	54	0	0	0	1	67
New Century Air Center	1	2	9	64	1	0	0	16	93
Noah's Ark	0	0	0	39	0	0	0	3	42
Roosterville	0	0	2	63	0	0	0	0	65
Sherman Army Airfield	0	0	0	25	0	0	0	0	25
Total	64	7	123	895	11	45	7	26	1,178

Sources: January 2015 airport management records, on-site visits, and FAA 5010 Reports.

Note: Multi-Engine (ME), Single-Engine (SE), Helicopter (Heli), Experimental (Expmt.).

*Other includes gliders/ultra lights

**Airport did not distinguish between multi-engine turbo and multi-engine piston

Airside Facilities

The study inventoried each airport's airside facilities. This part of the inventory effort included collecting data on current runways and taxiways at study airports. Specifically, dimensions, pavement type and condition, and lighting information were collected. This data is used throughout the study to determine the status and condition of the current facilities, specifically the adequacy of the airside facilities and their ability to meet current and future demand.

Runway Information

Each airport's runway information is reported in Table 2-4 and Table 2-5. A majority of the study airports have only one runway; the information for those airports that have a crosswind or secondary runway is found in Table 2-6 and Table 2-7. Runway information collected and shown in Table 2-4 through Table 2-7 includes:

- Runway Dimensions
- Pavement Type
- Pavement Condition
- Runway Lighting
- Runway Approach Lighting

As shown in Table 2-4, primary runway lengths for the general aviation study airports range from 2,000 feet at Excelsior Springs Municipal to 7,339 feet at New Century Air Center. For study airports, runway lengths generally are related to the most demanding type of aircraft operating at each airport and its operational characteristics. Runway widths also vary among the airports. Not all study airports are publicly-owned airports, several are privately-owned. Most study airports that are publicly-owned are eligible to compete

for FAA grants and hence must comply with FAA design standards. According to FAA design standards, the minimum runway width is 60 feet. As shown in Table 2-4, many of the study airports have a current runway width that is less than 60 feet. In subsequent portions of this study, the adequacy of current runway lengths and widths will be considered.

A majority of all primary runways have some type of lighting system; however, as shown in Table 2-5, some of these systems are “non-standard.” Runway lights help airports remain operational during periods of reduced visibility and throughout nighttime hours. The inventory also collected information on study airports that have approach lighting systems. Three of the general aviation airports and Kansas City International airport have approach lighting systems. Approach lighting systems are needed only when an airport has a precision instrument approach. Runway approach capabilities are discussed in a subsequent section of the inventory.

Table 2-5 also provides information on runway composition and general runway condition. For some study airports, an actual pavement condition index (PCI) has been calculated. Missouri’s Aviation Section, as part of its statewide system planning efforts, periodically evaluates pavement conditions for airports in Missouri. PCIs are calculated to provide airport owners/sponsors with strategies to most effectively maintain their runways and taxiway systems. Generally speaking, a PCI of 70 or above indicates that, most likely, no immediate pavement maintenance activities are required. When PCIs decrease, more costly runway overlays or even projects to rebuild a runway can be required. As the regional system plan progressed, some study airports actually undertook projects which changed information on pavement conditions reported as part of the inventory effort. If an airport improved its runway pavement condition, that information is presented later in the plan.

As part of the system plan analysis, steps will be undertaken to determine the adequacy of both primary and crosswind runways and their support systems at study airports.

Taxiway Information

Full parallel taxiways are most often needed at the busiest of airports or at airports that have a precision approach. A full parallel taxiway improves both safety and operational capacity of the runway. Because many of the study airports have lower activity levels, they do not have a full parallel taxiway; however, nearly all of the airports have at least a taxiway turnaround. Turnarounds are located on runway ends; they provide landing aircraft with the ability to turn around once they land and to taxi back on the runway to reach hangar areas or other landside facilities.

Taxiway information collected as part of this study includes the type of taxiway system and taxiway lighting. The types of taxiways vary from full parallel, partial parallel, turnaround, and stub turnaround. All taxiways contribute to an airport’s safety and operating efficiency. Current taxiway information for each airport is shown in Table 2-8. Based on the airport’s role and level of activity, the study will review the adequacy of each airport’s current taxiway system.

Table 2-4 – Primary Runway Dimensions

Airport	Designation	Length (feet)	Width (feet)
Charles B. Wheeler Downtown	01/19	6,827	150
East Kansas City	09/27	4,507	44
Excelsior Springs Memorial	01/19	2,000	47
Gardner Municipal	08/26	2,960	39
Johnson County Executive	18/36	4,098	75
Kansas City International	01L/19R	10,801	150
Lawrence Smith Memorial	17/35	4,000	75
Lee's Summit Municipal	18/36	4,016	75
Miami County	03/21	3,398	60
Midwest National Air Center	18/36	5,504	100
New Century Air Center	18/36	7,339	150
Noah's Ark	15/33	3,000	30
Roosterville	18/36	2,780	20
Sherman Army Airfield	16/34	5,318	102

Source: Airport Management records, FAA 5010 Reports.

Table 2-5 – Primary Runway Information (January 2015)

Airport	Pavement Type	Pavement Condition	*Runway Lighting	**Approach Lighting
Charles B. Wheeler Downtown	Concrete	Good	HIRL	MALSF (19)
East Kansas City	Asphalt	Good	MIRL	None
Excelsior Springs Memorial	Asphalt	Poor	NSTD LIRL	None
Gardner Municipal	Asphalt	Good	NSTD	None
Johnson County Executive	Concrete	Fair	MIRL	MALSR (36)
Kansas City International	Asphalt	Excellent	HIRL	MALSR (01L), ALSF2 (19R)
Lawrence Smith Memorial	Asphalt	Good	MIRL	None
Lee's Summit Municipal	Concrete	Good	MIRL	None
Miami County	Asphalt	Good	MIRL	None
Midwest National Air Center	Asphalt	Good	HIRL	None
New Century Air Center	Asphalt	Good	HIRL	MALSR (36)
Noah's Ark	Asphalt	Good	LIRL	None
Roosterville	Asphalt	Good	NSTD MIRL	None
Sherman Army Airfield	Concrete	Fair	HIRL	None

Source: Airport Management records, FAA 5010 Reports.

*Note: High Intensity Runway Lighting (HIRL), Medium Intensity Runway Lighting (MIRL), Non-Standard (NSTD), Low Intensity Runway Lighting (LIRL)

**Note: Medium-intensity Approach Lighting System with Sequenced Flashing lights (MALSF), Medium-intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR), Approach Lighting System with Sequenced Flashing Lights configuration 2 (ALSF2)

Table 2-6 – Crosswind Runway Dimensions

Airport	Designation	Length (feet)	Width (feet)
Charles B. Wheeler Downtown	03/21	5,050	100
East Kansas City	05/23	2,206	20
Excelsior Springs Memorial	-	-	-
Gardner Municipal	-	-	-
Johnson County Executive	-	-	-
Kansas City International	01R/19L	9,500	150
Lawrence Smith Memorial	-	-	-
Lee's Summit Municipal	11/29	3,800	75
Miami County	15/33	2,572	60
Midwest National Air Center	-	-	-
New Century Air Center	04/22	5,132	100
Noah's Ark	-	-	-
Roosterville	-	-	-
Sherman Army Airfield	-	-	-

Source: Airport Management records, FAA 5010 Reports.

Table 2-7 – Crosswind Runway Pavement and Lighting Information

Airport	Pavement Type	Pavement Condition	*Runway Lighting	Approach Lighting
Charles B. Wheeler Downtown	Asphalt	Excellent	HIRL	RLLS
East Kansas City	Asphalt	Fair	None	None
Excelsior Springs Memorial	-	-	-	-
Gardner Municipal	-	-	-	-
Johnson County Executive	-	-	-	-
Kansas City International	Concrete	Fair	HIRL	ALSF2 (01R), MALSR (19L)
Lawrence Smith Memorial	-	-	-	-
Lee's Summit Municipal	Concrete	Good	MIRL	None
Miami County	Turf	Fair	None	None
Midwest National Air Center	-	-	-	-
New Century Air Center	Asphalt	Good	MIRL	-
Noah's Ark	-	-	-	-
Roosterville	-	-	-	-
Sherman Army Airfield	-	-	-	-

Source: Airport Management records, FAA 5010 Reports.

*Note: High Intensity Runway Lighting (HIRL), Runway Lead-In Lighting (RLLS), Medium Intensity Runway Lighting (MIRL), Approach Lighting System with Sequenced Flashing Lights configuration 2 (ALSF2)

Table 2-8 – Taxiway Information

Airport	Type	*Lighting
Charles B. Wheeler Downtown	Full Parallel	HIRL
East Kansas City	Partial Parallel	None
Excelsior Springs Memorial	Partial Parallel, Stub Turnaround (Runway 01)	None
Gardner Municipal	None	None
Johnson County Executive	Full Parallel	MITL
Kansas City International	Full Parallel	HIRL
Lawrence Smith Memorial	Turnaround	None
Lee's Summit Municipal	Full Parallel	MITL
Miami County	Stub Turnaround (Runway 21)	None
Midwest National Air Center	Full Parallel	MITL
New Century Air Center	Full Parallel	MITL
Noah's Ark	None	None
Roosterville	Stub Turnaround (Runway 36)	None
Sherman Army Airfield	None	None

Source: Airport Management records, FAA 5010 Reports.

*Note: High Intensity Taxiway Lighting (HITL) and Medium Intensity Taxiway Lighting (MITL)

Navigational, Approach and Landing Aids

A variety of navigational aids (NAVAIDS) support operations at study airports. NAVAIDS provide information for enroute and ground-based pilots and include instrument approach aids, visual aids, and automated weather systems. NAVAIDS improve safety and help airports remain operational during periods of reduced visibility.

Instrument Approach Aids

Instrument approach aids are categorized by precision and non-precision. Precision instrument approaches provide both lateral and horizontal guidance to aircraft, while non-precision approaches provide primarily only lateral guidance. The most commonly used approach types include:

- **Instrument Landing System (ILS)** — ILS is a precision approach that provides precise vertical and horizontal guidance information to approaching aircraft. The ILS provides guidance through the use of a localizer, a glide slope and other ground-based facilities.
- **Global Positioning System (GPS)** — GPS is a non-precision approach. It is a space-based radio navigation system that consists of a network of satellites and ground stations. GPS satellites are capable of providing aircraft with three-dimensional position (latitude, longitude and altitude), velocity and time of day, in all weather conditions.
- **Area Navigation/Required Navigation Performance (RNAV/RNP)** — RNAV/RNP is a non-precision approach and a performance-based type of navigation that allows aircraft to fly on a desired path within the coverage of ground or space-based navigational aids. RNP-capable aircraft are equipped with onboard performance monitoring and alerting capabilities.
- **Very High Frequency Omni-Directional Range (VOR)** — VOR is a non-precision approach. It is a ground-based radio navigation aid that provides 360 degrees of continuous directional information and supplies aircraft with location relative to the VOR station.

- **Localizer (LOC)** — The LOC is a non-precision approach using a radio transmitting antenna that supplies aircraft with lateral course guidance to the runway.
- **Distance Measuring Equipment (DME)** — The DME is a non-precision approach, ground based, Ultra High Frequency navigation aid that corresponds to aircraft DME avionics. From this, aircraft are able to determine the slant range between the aircraft and ground station.
- **Non-Directional Beacon (NDB)** — The NDB is a non-precision approach, ground-based, low or medium frequency radio beacon that broadcasts non-directional signals on an assigned frequency signal. Pilots can use NDBs to determine their location in relation to the ground station.

As shown in Table 2-9, study airports are currently served by a variety of approach systems. Study airports that do not have either a precision or a non-precision approach have a visual approach. Later analysis in the study will determine if current approaches are sufficient to satisfy each airport’s role, customers, and activity levels.

Table 2-9 – Instrument Approach Types

Airport	Primary Runway End Approach Type	Primary Runway End Approach Type	Crosswind Runway End Approach Type	Crosswind Runway End Approach Type
Charles B. Wheeler Downtown	19-ILS, GPS, VOR, NDB	01-Visual	03-ILS, GPS, VOR	21-GPS, VOR
East Kansas City	09-RNAV/GPS	27-RNAV/GPS	05-Visual	23-Visual
Excelsior Springs Memorial	01-Visual	19-VOR/GPS	NA	NA
Gardner Municipal	08-Visual	26-Visual	NA	NA
Johnson County Executive	18-GPS, LOC	36-GPS, LOC	NA	NA
Kansas City International	01L-ILS, RNAV (RNP), RNAV (GPS)	19R-ILS, RNAV (RNP), RNAV (GPS)	01R-ILS, RNAV (RNP), RNAV (GPS)	19L-ILS, RNAV (RNP), RNAV (GPS)
Lawrence Smith Memorial	17-GPS	35-GPS	NA	NA
Lee's Summit Municipal	18-GPS	36-GPS	11-GPS	29-GPS
Miami County	03-GPS	21-GPS	15-Visual	33-Visual
Midwest National Air Center	18-ILS, LOC/DME, RNAV	36 - RNAV	NA	NA
New Century Air Center	18-GPS	36-ILS, GPS	04-Visual	22-Visual
Noah's Ark	15-Visual	33-Visual	NA	NA
Roosterville	18-Visual	36-Visual	NA	NA
Sherman Army Airfield	16-RNAV/GPS	34-RNAV/GPS, NDB	NA	NA

Source: Airnav.com.

Visual Aids

In addition to the above-mentioned instrument approach aids, airports also have visual aids to assist approaching aircraft. The visual aids help pilots locate the airport as well as offering approach guidance. The most common visual aids include:

- **Rotating Beacon** — A rotating beacon aids in pilot location of an airport at night. The light color combinations indicate the type of airport. White and green, which indicates a civilian land airport, is the most common combination.
- **Wind Sock** — Wind socks indicate wind direction and relative wind speed and can be lit or unlit.
- **Runway End Identification Lights (REILs)** — REILs are a lighting system consisting of two flashing lights located on each corner of the runway-landing threshold. The light from this system enables pilots to quickly identify the runway threshold on approach.
- **Precision Approach Path Indicators (PAPIs)** — PAPIs are a lighting system consisting of two or four lights located to the side of the runway touchdown zone. The light from this system provides visual glide path indication to the approaching aircraft through the use of red and white lights.
- **Visual Approach Slope Indicators (VASIs)** — VASIs are a lighting system located to the side of the runway touchdown zone. The light from this system provides visual approach slope guidance that ensures clearance of all obstructions in the approach area.

All study airports have visual aids as depicted in Table 2-10. The most common visual aids are a rotating beacon and a lighted wind sock.

Automated Weather

There are two primary automated weather systems at study airports: the Automated Weather Observation System (AWOS) and the Automated Surface Observation System (ASOS). Typically, these systems provide basic weather data such as temperature, dew point, density altitude, altimeter setter, and wind speed, and direction. The systems are defined as follows:

- **Automated Weather Observation System (AWOS)** — The AWOS automatically collects weather data from various locations on and around the airport. The information is then transmitted to pilots via a computer-generated voice message on a specified frequency.
- **Automated Surface Observation System (ASOS)** — The ASOS collects minute-by-minute weather observations, from which it generates aviation weather information. This information is disseminated to pilots by a computer-generated voice message via a specified radio frequency.

Table 2-10 depicts what type of automated weather system each study airport is equipped with.

Table 2-10 – Visual Aids and Automated Weather

Airport	Visual Aids	Weather
Charles B. Wheeler Downtown	Rotating Beacon, Lighted Wind Sock, VASI(01, 03/21), PAPI (19), REILs (01 and 21)	ASOS
East Kansas City	Rotating Beacon, VASI (09/27), REIL (09), Lighted Wind Sock	None
Excelsior Springs Memorial	Rotating Beacon, Lighted Wind Sock	None
Gardner Municipal	Rotating Beacon, Lighted Wind Sock	None
Johnson County Executive	Rotating Beacon, Lighted Wind Sock, VASI (18/36)	ASOS
Kansas City International	Rotating Beacon, Lighted Wind Sock, PAPI (01L/19R, 01R)	ASOS
Lawrence Smith Memorial	Rotating Beacon, Lighted Wind Sock, PAPI (17/35)	AWOS-III
Lee's Summit Municipal	Rotating Beacon, Lighted Wind Sock, VASI (18/36), PAPI (11/29), REILs (11/29 and 18/36)	ASOS
Miami County	Rotating Beacon, Lighted Wind Sock, PAPI (03/21), REILs (03/21)	None
Midwest National Air Center	Rotating Beacon, PAPI (18/36), REILs (18/36), Lighted Wind Sock	AWOS-III
New Century Air Center	Rotating Beacon, Lighted Wind Sock, VASI (18), PAPI (04/22), REILs (18)	ASOS
Noah's Ark	Wind Sock	None
Roosterville	Wind Sock	None
Sherman Army Airfield	Rotating Beacon Lighted Wind Sock, PAPI (16/34), REILs (16/34)	AWOS (military installed)

Source: Airnav.com.

Landside Facilities

Landside facilities support aircraft and flight activities. The landside facilities collected as part of the inventory effort include fuel, terminal and FBO facilities, hangars, tie-downs, and auto parking areas.

Fuel Services

Fuel service is typically available at most airports; all study airports currently have some type of fuel. The three types of fuel most commonly used for aviation activities are 100LL (AvGas), Jet A, and MoGas (automotive gas). AvGas is used by most general aviation, piston engine aircraft, while Jet A fuel is used by larger turbo-prop twin-engine and jet aircraft. MoGas is used less frequently and is available at only three of the study airports. Table 2-11 depicts what fuel is available at each study airport.

Table 2-11 – Airport Fuel

Airport	Jet A	AvGas	MoGas
Charles B. Wheeler Downtown	Yes	Yes	No
East Kansas City	Yes	Yes	No
Excelsior Springs Memorial	No	Yes	No
Gardner Municipal	No	Yes	Yes
Johnson County Executive	Yes	Yes	No
Kansas City International	Yes	Yes	No
Lawrence Smith Memorial	No	Yes	No
Lee's Summit Municipal	Yes	Yes	Yes
Miami County	No	Yes	No
Midwest National Air Center	Yes	Yes	Yes
New Century Air Center	Yes	Yes	No
Noah's Ark	No	Yes	No
Roosterville	No	Yes	No
Sherman Army Airfield	Yes	Yes	No

Source: Missouri and Kansas Airport Directories.

Terminal and Fixed Base Operator (FBO) Facilities

The general aviation terminal and FBO facilities provide pilots and passengers with basic facilities. All study airports offer at least a basic terminal building with restrooms, while some of the larger airports also have FBOs that provide additional accommodations and services. Current terminal and FBO facilities are shown in Table 2-12.

Table 2-12 – Terminal and FBO Facilities

Airport	Terminal Building	FBO	FBO Building	Restrooms	Rental Car
Charles B. Wheeler Downtown	Yes	Full Service	Yes	Yes	Yes
East Kansas City	Yes	Full Service	Yes	Yes	Yes
Excelsior Springs Memorial	Yes	None	No	Yes	No
Gardner Municipal	Yes	None	No	Yes	No
Johnson County Executive	Yes	Full Service	Yes	Yes	Yes
Kansas City International	Yes	Full Service	Yes	Yes	Yes
Lawrence Smith Memorial	Yes	Limited Service	Yes	Yes	Yes
Lee's Summit Municipal	Yes	Full Service	Yes	Yes	Yes
Miami County	Yes	Limited Service	No	Yes	No
Midwest National Air Center	Yes	Full Service	Yes	Yes	Yes
New Century Air Center	Yes	Full Service	Yes	Yes	Yes
Noah's Ark	Yes	Limited Service	Yes	Portables	No
Roosterville	Yes	Full Service	Yes	Yes	No
Sherman Army Airfield	Yes	Full Service	Yes	Yes	No

Source: Missouri and Kansas Airport Directories and Study Questionnaire.

Aircraft Hangars, Tie-Downs, and Auto Parking

One objective for the system plan inventory effort was to gather information on aircraft storage surpluses and deficits for study airports. In addition, on an airport-by-airport basis, information on waiting lists for hangar storage was also collected, if these lists were available. It is important to note that within a specific geographic area where airports are in proximity to one another, aircraft owners sometimes have their names on more than one waiting list. In addition, some aircraft owners add their name to a hangar waiting list in the hopes of securing a particular type of space or a space that rents at a lower rate. Also, once aircraft owners put their names on a waiting list, they often do not remove their names, even after they secure hangar spaces. As a result, while hangar waiting lists can provide some insight into unmet needs for hangar storage in a particular market area, information on these lists needs to be viewed cautiously.

Hangars provide secure and covered parking for aircraft and are generally a mix of T-hangars and conventional hangars. Conventional hangars are often not owned or leased by the airport. The most prevalent situation is for the airport to own the land on which the hangar is constructed, but to lease that land to a third party; the third party then typically builds the conventional hangar. As a result, while many of the study airports have conventional hangar facilities, the airport does not control the leasing of the spaces within these hangars. Spaces within privately-owned conventional hangars are often not really available to meet the airport's aircraft storage requirements.

Table 2-13 provides the number of T-hangar spaces reported by each airport as part of the inventory effort. As shown, for all study airports, there are a reported 892 T-hangar spaces. Since T-hangars almost always accommodate just one plane, the availability of this type of aircraft storage is more readily established than storage spaces provided in conventional hangars. Table 2-13 also provides information on the percent of each airport's T-hangars that are currently leased and the number of aircraft wait-listed for T-hangar storage at each airport. Currently, study airports report there are 268 aircraft on waiting lists for T-hangar storage. Again, it is important to note that the cumulative waiting list for T-hangar storage most likely does not reflect accurate demand for T-hangars in the study area.

Table 2-14 presents similar information for conventional hangar aircraft storage. As mentioned, most conventional hangars at study airports are not owned by the airport, but rather by a third party. As a result, conventional hangars storage spaces are often not available to the general public. Also, all square footage within a conventional hangar is typically not available for aircraft storage. Conventional hangars often have areas allocated for aircraft maintenance, meeting space, office space, and some reserved overnight parking for transient or visiting aircraft. Further the number of aircraft that can be stored in a conventional hangar varies greatly depending on the size of aircraft and the need to have reserved space to maneuver aircraft in and out of the hangar. As result, it is difficult to estimate an exact number of parking spaces for based aircraft that are in conventional hangars.

Each study airport was contacted in an effort to determine the number of conventional hangar storage spaces that are available to meet the needs of based aircraft. Table 2-14 reflects each airport's estimate of the number of spaces that are available in conventional hangars to serve based aircraft. As shown in Table 2-14, there are an estimated 427 spaces available for based aircraft parking in conventional hangars at all study airports. Table 2-14 shows that there are a reported 32 aircraft on waiting lists for conventional hangar storage. Since monthly rental rates for conventional hangar storage are typically significantly higher than those for T-hangar storage, it is not surprising that fewer aircraft owners are reportedly seeking conventional hangar storage.

Table 2-15 provides information on the number of tie-down spaces reported for each study airport. In some cases, tie-down spaces are used for both based and visiting aircraft. Typically, in areas that are prone to hail, ice/snow, and hot summer temperatures, based aircraft owners prefer to keep their aircraft in covered storage. Nevertheless, because of lower monthly rental rates, some aircraft owners do opt for renting a tie-down space.

Table 2-16 provides a summary of aircraft storage spaces by aircraft. These spaces are compared to each airport's current based aircraft. In subsequent sections of the system plan, the need to provide additional hangar or tie-down space on an airport-by-airport basis will be examined.

Table 2-17 provides information on current auto parking for general aviation employees and customers at study airports. Auto parking spaces are divided between paved and unpaved. Subsequent portions of the system plan will include analysis that helps to establish whether current aircraft storage and auto parking facilities at study airports are sufficient to meet existing and future demand, along with fulfilling the airport's role in the regional system.

Table 2-13 – T-Hangar Spaces

Airport	Spaces	% Leased	# on Waitlist
Charles B. Wheeler Downtown	106	100%	5
East Kansas City	30	95%	0
Excelsior Springs Memorial	17	30%	0
Gardner Municipal	98	100%	100
Johnson County Executive	128	100%	60
Kansas City International	*NP	*NP	*NP
Lawrence Smith Memorial	46	100%	15
Lee's Summit Municipal	152	92%	8
Miami County	22	100%	20
Midwest National Air Center	76	88%	0
New Century Air Center	90	100%	60
Noah's Ark	45	88%	0
Roosterville	62	95%	0
Sherman Army Airfield	20	90%	0
Total	892	91% (average)	268

Source: Study Questionnaire.

*Data not provided

Table 2-14 – Conventional Hangar Spaces

Airport	Spaces	% Leased	# on Waitlist
Charles B. Wheeler Downtown	120	95%	0
East Kansas City	171	100%	0
Excelsior Springs Memorial	11	75%	0
Gardner Municipal	1	100%	0
Johnson County Executive	66	100%	0
Kansas City International	*NP	*NP	*NP
Lawrence Smith Memorial	5	75%	10
Lee's Summit Municipal	25	100%	2
Miami County	2	100%	20
Midwest National Air Center	8	50%	0
New Century Air Center	9	100%	0
Noah's Ark	0	0%	0
Roosterville	6	100%	0
Sherman Army Airfield	3	100%	0
Total	427	84% (average)	32

Source: Study Questionnaire.

* Data not provided

Table 2-15 – Tie-Down Spaces

Airport	Based Aircraft	Transient Aircraft
Charles B. Wheeler Downtown	26	24
East Kansas City	0	28
Excelsior Springs Memorial	0	10
Gardner Municipal	15	Shared w/Based
Johnson County Executive	86	16
Kansas City International	0	*NP
Lawrence Smith Memorial	4	11
Lee's Summit Municipal	15	45
Miami County	17	Shared w/Based
Midwest National Air Center	0	14
New Century Air Center	67	Shared w/Based
Noah's Ark	0	0
Roosterville	0	12
Sherman Army Airfield	2	4
Total	232	164

Source: Study Questionnaire.

* Data not provided

Table 2-16 – Based Aircraft and Storage Space

Airport	T-Hangar Spaces	Conventional Hangar Spaces	Tie-Down Spaces	Based Aircraft
Charles B. Wheeler Downtown	106	120	26	237
East Kansas City	30	171	0	201
Excelsior Springs Memorial	17	11	0	18
Gardner Municipal	98	1	15	104
Johnson County Executive	128	66	86	113
Kansas City International	*NP	*NP	0	3
Lawrence Smith Memorial	46	5	4	34
Lee's Summit Municipal	152	25	15	152
Miami County	22	2	17	24
Midwest National Air Center	76	8	0	67
New Century Air Center	90	9	67	93
Noah's Ark	45	0	0	42
Roosterville	62	6	0	65
Sherman Army Airfield	20	3	2	25
Total	892	427	232	1,175

Source: Study Questionnaire.

*Data not provided

Table 2-17 – Automobile Parking

Airport	Paved	Un-paved
Charles B. Wheeler Downtown	*NP	*NP
East Kansas City	10	0
Excelsior Springs Memorial	18	0
Gardner Municipal	18	100
Johnson County Executive	230	0
Kansas City International	*NP	*NP
Lawrence Smith Memorial	25	10
Lee's Summit Municipal	53	0
Miami County	17	0
Midwest National Air Center	87	0
New Century Air Center	120	0
Noah's Ark	0	20
Roosterville	20	5
Sherman Army Airfield	0	20

Source: Study Questionnaire.

*Data not provided

Chapter Three: Outlook for Future Demand

Introduction

This chapter discusses findings and methodologies used to project future aviation demand for study airports. Forecasts developed in the Greater Kansas City Regional Aviation System Plan provide a framework to guide analysis for future development. It should be recognized, however, that there may be short- and long-term fluctuations in demand projections due to a variety of factors that cannot be anticipated.

Projections of aviation activity for the study area were prepared for near-term (2020), mid-term (2025), and long-term (2035) timeframes. These projections assume that study airports will develop the various facilities necessary to accommodate future based aircraft and operational needs.

Historical and Current Aviation Activity

Historical activity data for airports provides a baseline from which future activity can be projected. While historical trends are not always reflective of future periods, this data does provide useful insight into how local, regional, and national socio-economic, demographic, and aviation-related trends may be tied to future growth.

Based Aircraft

Based aircraft are those aircraft that are permanently stored at an airport. In January 2015, 1,175 aircraft were based at the 13 general aviation airports in the study area. This figure does not include three jets that are currently based at Kansas City International Airport. A projection of general aviation activity for KCI is shown separately at the end of this chapter, based on data provided by the FAA and/or the airport.

As shown in Table 3-1, more than 75 percent of the based aircraft at the 13 study airports are single-engine aircraft. Most of the jets based in the study area are located at Charles B. Wheeler Downtown. Two airports have more than 200 based aircraft: Charles B. Wheeler Downtown (20 percent of total based aircraft in the study) and East Kansas City (17 percent of total based aircraft) each have over 200 based aircraft. Three other airports each have more than 100 based aircraft: Gardner Municipal, Johnson County Executive, and Lee's Summit Municipal.

Table 3-1 – 2015 Based Aircraft by Type

Airport	Jet	ME	SE	Heli	Expmt.	Sport	Other	Total
Charles B. Wheeler Downtown	53	63	115	6	0	0	0	237
East Kansas City	0	15	185	1	0	0	0	201
Excelsior Springs Memorial	0	1	16	0	0	0	1	18
Gardner Municipal	0	2	88	0	10	0	4	104
Johnson County Executive	2	13	97	1	0	0	0	113
Lawrence Smith Memorial	0	2	25	1	0	6	0	34
Lee's Summit Municipal	2	12	102	1	33	1	1	152
Miami County	0	0	22	0	2	0	0	24
Midwest National Air Center	3	9	54	0	0	0	1	67
New Century Air Center	1	11	64	1	0	0	16	93
Noah's Ark	0	0	39	0	0	0	3	42
Roosterville	0	2	63	0	0	0	0	65
Sherman Army Airfield	0	0	25	0	0	0	0	25
Total	61	130	895	11	45	7	26	1,175
Percent of Total	5.2%	11.1%	76.2%	0.9%	3.8%	0.6%	2.2%	

Sources: January 2015 airport management records, on-site visits, and FAA 5010 Reports.

Note: Multi-Engine (ME), Single-Engine (SE), Helicopter (Heli), Experimental (Expmt.).

Information on historical based aircraft (prior to the current timeframe) is only available for eight of the 13 study airports. These are the study airports that are included in the FAA's National Plan of Integrated Airport System (NPIAS). As shown in Table 3-2, the number of based aircraft at the NPIAS airports declined by 26 percent between 2000 and 2015. Johnson County Executive and New Century Air Center experienced the largest declines in based aircraft.

When reviewing the data in Table 3-2, it is important to note that the FAA implemented a new program to count based aircraft between the 2005 and 2010 reporting periods. This change was primarily intended to reduce double and even triple counting of based aircraft at more than one airport. It is likely that some of the decrease reported between 2005 and 2010 was not because of an actual contraction in the number of based aircraft, but rather a result of the new counting program. The FAA's based aircraft counting program no longer allows aircraft to be counted at more than one airport, and it also eliminated counting aircraft that were not airworthy. According to FAA data, between 2007 and 2010, total active aircraft in the U.S. decreased from 231,606 to 223,370. While some of this decline may be attributed to aircraft that were "retired," it is more likely the decrease was related to the improved counting program.

While there was an overall downward trend in based aircraft at the NPIAS airports included in the regional system plan between 2000 and 2015, the total number of based aircraft at these airports actually increased between 2010 and 2015. Six of the eight airports shown in Table 3-2 had an increase in their based aircraft in the last five years (2010–2015). The number of based aircraft at all NPIAS airports included in the regional system plan increased at an average annual rate of 1.1 percent between 2010 and 2015. Growth in this most recent reporting period is important, as it helps in establishing reasonable trends for based aircraft at study airports over the next 20 years.

Table 3-2 – Historic Based Aircraft (NPIAS Airports Only)

Airport	2000	2005	2010	2015	2000-2015		2010-2015	
					Change	CAGR	Change	CAGR
Charles B. Wheeler Downtown	296	206	189	237	-59	-1.5%	48	4.6%
Gardner Municipal	94	96	71	104	10	0.7%	33	7.9%
Johnson County Executive	263	234	143	113	-150	-5.5%	-30	-4.6%
Lawrence Smith Memorial	53	58	26	34	-19	-2.9%	8	5.5%
Lee's Summit Municipal	170	169	146	152	-18	-0.7%	6	0.8%
Miami County	24	23	19	24	0	0.0%	5	4.8%
Midwest National Air Center	0	47	53	67	67	NA	14	4.8%
New Century Air Center	213	193	132	93	-120	-5.4%	-39	-6.8%
Total NPIAS Airports	1,113	1,026	779	824	-289	-2.0%	45	1.1%

Sources: Airport management records, FAA Terminal Area Forecasts.

Note: Historical based aircraft data not available for Non-NPIAS airports: East Kansas City, Excelsior Springs Memorial, Noah's Ark, Roosterville, and Sherman Army Airfield.

Operations

An operation is defined as either a takeoff or a landing. Current aircraft operational data for this system plan were derived from airport managers' verification of the FAA's 5010 reports or from data reported by airport air traffic control towers. Existing operations by category at each study airport are summarized in Table 3-3 and Figure 3-1. Local operations are defined by the FAA as those performed by aircraft that 1) operate in a local traffic pattern or within sight of an airport, 2) depart or arrive to practice within a 20-mile radius, or 3) execute an instrument approach. All other operations are considered itinerant. Air taxi operations are itinerant operations that are typically conducted by air charter operators. Military operations can be considered local or itinerant and make up only 2 percent of the operations at study area general aviation airports.

Annual operations at study airports are expected to total 315,855 in 2015. It is important to note that these numbers are estimates, because most airports do not count actual operations. Only airports with air traffic control towers (ATCT) are able to generate accurate counts of their annual general aviation operational activity. Charles B. Wheeler Downtown, Kansas City International, Johnson County Executive, and New Century Air Center are the study airports that have air traffic control towers.

Table 3-3 – Current Estimated Annual Operations

Airport	Local Operations	Itinerant Operations	Air Taxi Operations	Military Operations	Total Operations
Charles B. Wheeler Downtown*	14,332	40,565	14,284	1,044	70,225
East Kansas City	7,880	2,800	1,200	120	12,000
Excelsior Springs Memorial	2,400	1,600	0	20	4,020
Gardner Municipal*	18,200	7,800	0	0	26,000
Johnson County Executive*	19,031	29,819	495	198	49,543
Lawrence Smith Memorial*	5,000	2,000	25	30	7,055
Lee's Summit Municipal*	33,350	14,950	1,725	518	50,543
Miami County *	6,200	3,700	0	100	10,000
Midwest National Air Center*	7,990	3,040	1,020	8	12,058
New Century Air Center*	18,795	20,370	2,245	2,501	43,911

Table 3-3 – Current Estimated Annual Operations

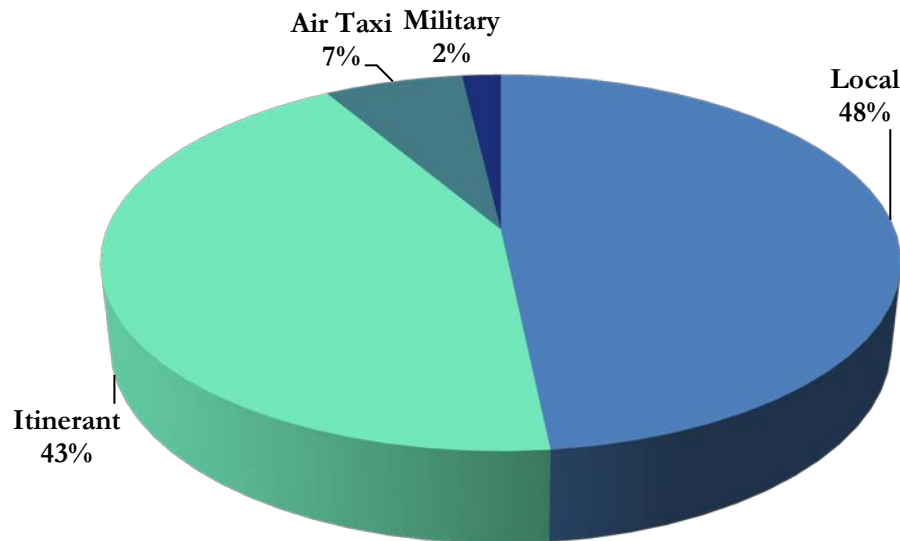
Airport	Local Operations	Itinerant Operations	Air Taxi Operations	Military Operations	Total Operations
Noah's Ark	7,300	0	0	0	7,300
Roosterville	3,000	500	0	0	3,500
Sherman Army Airfield	9,200	9,200	0	1,300	19,700
Total	152,678	136,344	20,994	5,839	315,855
% of Total	48%	43%	7%	2%	

Sources: Airport management records, FAA 5010 Reports, FAA ATADS database

Note: Actual operations included for the three airports with air traffic control towers: Charles B. Wheeler Downtown, Johnson County Executive, and New Century Air Center.

*Airports included the FAA's NPIAS.

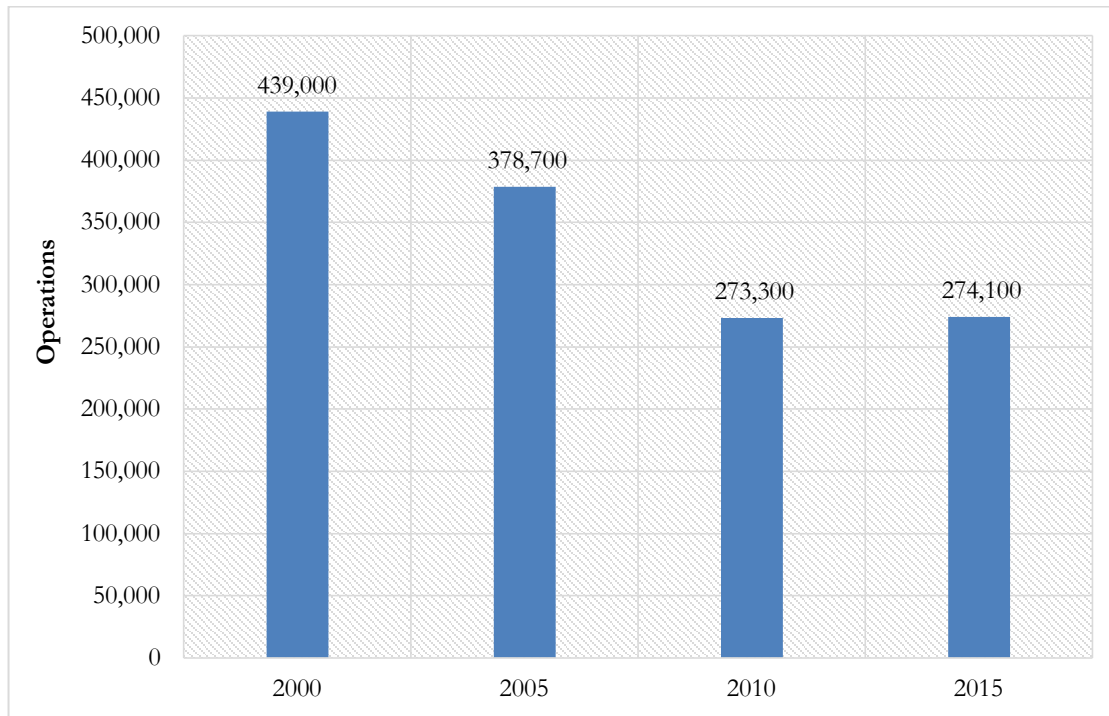
Figure 3-1 - 2015 Annual Operations



315,855 Total Annual Operations

The eight NPIAS airports represented 85 percent of all aircraft operations in 2015. As shown in Figure 3-2, total annual operations at NPIAS study airports (the only airports with available historical operational data) have declined over the last 15 years, down 39 percent overall for a compound annual rate (CAGR) of decrease of -3.2 percent between 2000 and 2015. This trend was not unique to airports in the study area and is reflective of the decline in general aviation activity across the nation due to economic weakness and high fuel prices. All types of operations at general aviation airports (local, itinerant, air taxi and military) have declined over the last 10 years. As shown in Figure 3-2, total annual estimated general aviation operations at the NPIAS study airports stabilized, showing only a modest decrease between 2010 and 2015.

Figure 3-2 - Historical Annual Operations (NPIAS Study Airports Only)



Sources: Airport management records, FAA *Terminal Area Forecasts*

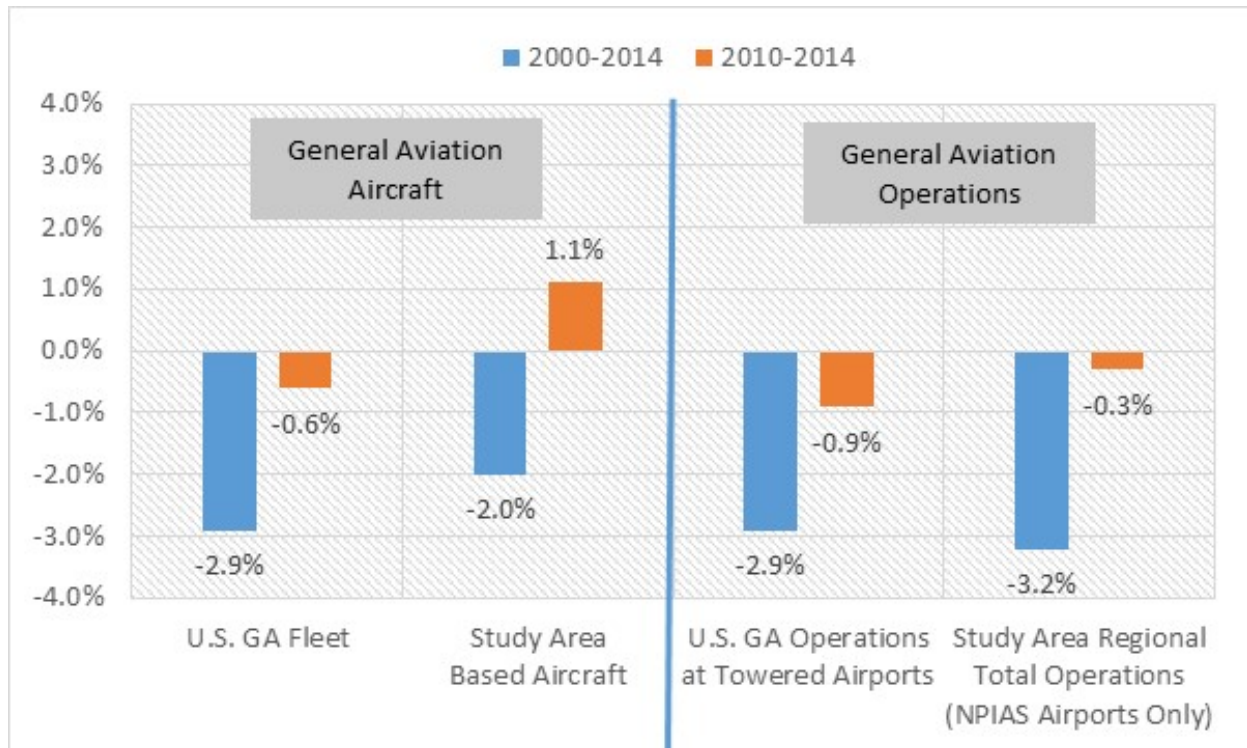
Note: Historical annual operational data not available for Non-NPIAS airports: East Kansas City, Excelsior Springs Memorial, Noah's Ark, Roosterville, and Sherman Army Airfield.

To better understand the region's trends in based general aviation aircraft and total annual general aviation operations, comparative information for the U.S. was reviewed. Comparative U.S. data is presented in Figure 3-3. Between 2000 and 2014, the total U.S. active general aviation fleet declined at an average annual rate of -2.9 percent, compared to an average annual rate of decline of -2.0 percent for the NPIAS airports included in this plan. While the active U.S. general aviation fleet decreased at an average annual rate of -0.6 percent between 2010 and 2014, based aircraft at NPIAS airports included in the regional system plan actually increased at an average annual rate of 1.1 percent during this more recent timeframe.

FAA's National Aerospace Forecast contains information on total annual general aviation at towered airports. This information shows annual general aviation operations at all towered airports in the U.S. decreased at an average annual rate of -2.9 percent between 2000 and 2014. Estimated annual operations at the NPIAS study airports followed a similar trend. Between 2000 and 2014, estimated annual operations at the eight NPIAS airports decreased at an average annual rate of -3.2 percent, higher than the national rate.

Since activity trends (based aircraft and annual operations) at study airports have for the most part been similar to national trends, it is reasonable to assume that future trends at study-area airports may also be similar to national trends projected by FAA.

Figure 3-3 - Comparison of Study Area and National General Aviation Trends



Sources: Airport management records, FAA ATADS database, *FAA Aerospace Forecast Fiscal Years 2014-2034*.

Trends/Issues Influencing Future General Aviation Growth

In addition to historical airport activity, several other factors may influence future aviation growth. It is worthwhile to review these outside influences and examine how they may impact future growth. These factors include area demographics and national aviation trends.

Regional Demographics

Socioeconomic characteristics are often collected and examined during the system planning process to derive an understanding of the dynamics of historical and projected growth within the area being studied. This type information can also be used as a tool to forecast aviation demand.

MARC is the Metropolitan Planning Organization (MPO) for the Greater Kansas City area. Its planning area includes nine counties: five in Missouri (Clay, Platte, Ray, Jackson and Cass) and four in Kansas (Leavenworth, Wyandotte, Johnson and Miami). MARC’s planning area is smaller than both the 22-county Kansas City-Overland Park-Kansas City MO-KS Combined Statistical Area (CSA) and the 15-county Kansas City MO-KS Metropolitan Statistical Area (MSA). This section provides information for the MSA when MARC-specific data is not available. A summary of historical and projected trends for the study area are discussed below.

Population

Between 2000 and 2013, the population of the nine MARC counties grew 14 percent, or at an average annual rate of 1.0 percent per year (see Table 3-4). In 2013, it was estimated that the nine county planning area had a population of 1.97 million, up from 1.7 million in 2000.

Table 3-4 – MARC Planning Area Population & Employment

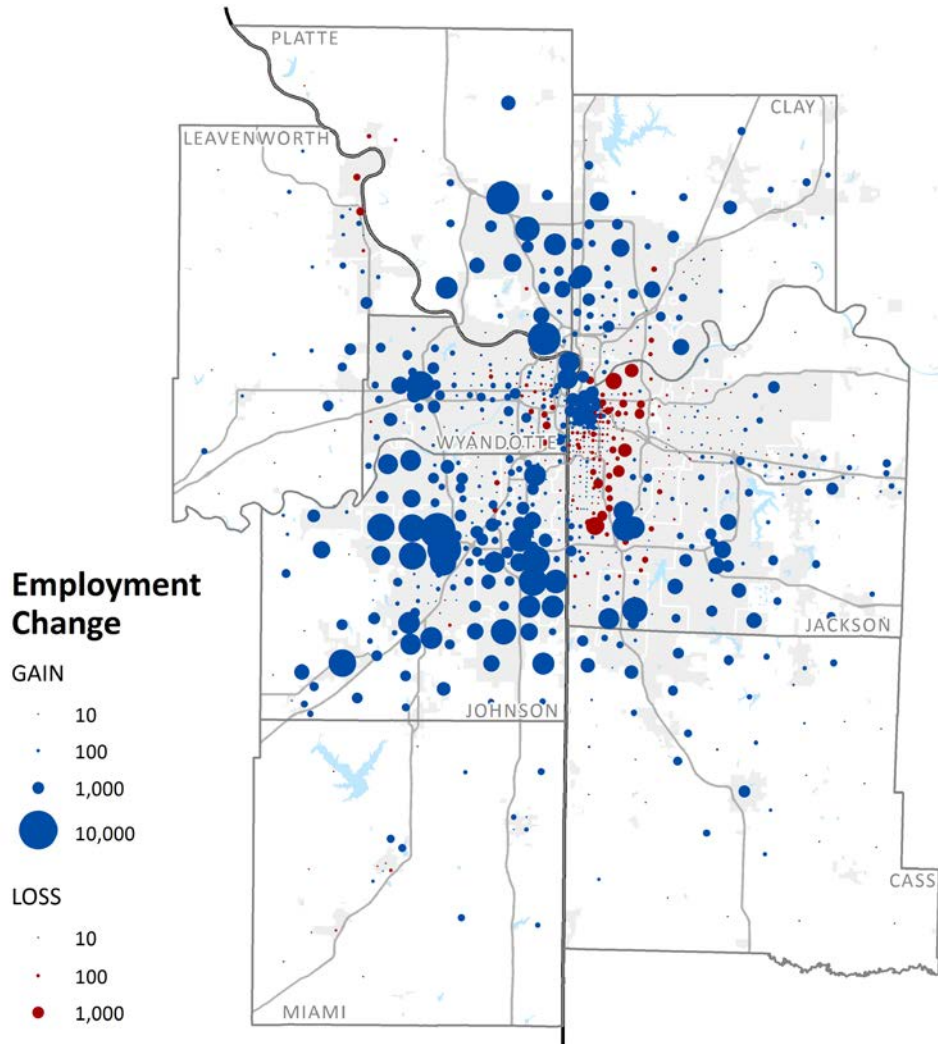
County	Population			Employment		
	2000	2013	CAGR	2000	2013	CAGR
Cass	82,092	100,641	1.6%	43,479	46,666	0.5%
Clay	184,006	230,473	1.7%	104,031	113,198	0.7%
Jackson	654,880	679,996	0.3%	333,861	304,790	-0.7%
Platte	73,781	93,310	1.8%	43,810	48,027	0.7%
Ray	23,354	23,039	-0.1%	11,599	10,107	-1.1%
Johnson	451,086	566,933	1.8%	255,705	287,314	0.9%
Leavenworth	68,691	78,185	1.0%	30,074	30,924	0.2%
Miami	28,351	32,835	1.1%	14,864	15,516	0.3%
Wyandotte	157,882	160,384	0.1%	69,878	64,265	-0.6%
Total	1,724,123	1,965,796	1.0%	907,301	920,807	0.1%

Sources: U.S. Census Bureau, Mid-America Regional Council, Bureau of Labor Statistics.

According to forecasts developed by MARC's Research Services Department, population is projected to grow at 1.1 percent per year, on average, between 2010 and 2040. Figure 3-4 graphically depicts where most of the growth is anticipated in the area. MARC population projections do not include Ray County. As shown, Johnson and Clay counties are projected to experience the greatest growth. By 2040, the MARC area is expected to have a population of 2.6 million. In comparison, population for the states of Kansas and Missouri is expected to grow at slower rates, experiencing CAGRs of 0.4 percent and 0.6 percent, respectively, between 2010 and 2040.¹

¹ Sources: U.S. Census Bureau, MARC 2011 Update to Last Long Range Forecast, University of Kansas Institute for Policy and Social Research, Missouri Office of Administration Division of Budget and Planning.

Figure 3-4 - MARC 2040 Population Forecast



Source: *MARC Transportation Outlook 2040*, 2015

Employment

As presented in Table 3-4, employment in the nine-county region increased slightly, at an average annual rate of 0.1 percent per year between 2000 and 2013. In 2013, it was estimated that the nine-county planning area had employment of 920,000, up from 907,000 million in 2000. By the end of 2014, employment within the region reached 927,000. MARC projects study area employment to grow at 1.4 percent per year, on average, between 2010 and 2040 in Cass, Clay, Jackson, Platte, Johnson Leavenworth and Wyandotte counties. (Sources: *MARC*, *U.S. Bureau of Labor Statistics*)

Table 3-5 presents anticipated trends in population and employment growth for the study area. These trends will be considered as projections of aviation demand for each study airport are developed.

Table 3-5 – MARC Population and Employment Projections

County	Population			Employment		
	2010	2040	CAGR	2010	2040	CAGR
Cass	99,478	154,168	1.5%	23,167	37,215	1.6%
Clay	221,939	378,167	1.8%	89,224	156,573	1.9%
Jackson	674,158	809,424	0.6%	348,508	438,511	0.8%
Platte	89,322	157,546	1.9%	312,303	571,599	2.0%
Johnson	544,179	825,848	1.4%	16,492	23,313	1.2%
Leavenworth	76,227	99,195	0.9%	39,253	68,921	1.9%
Wyandotte	157,505	183,523	0.5%	70,477	84,012	0.6%
Total	1,862,808	2,607,871	1.1%	899,424	1,380,145	1.4%

Sources: U.S. Census Bureau, Mid-America Regional Council, 2011 Update to Last Long Range Forecast.

Note: Ray and Miami counties are not included in MARC long range projections.

Projected average annual rates of population growth for the study area are similar to those that have been experienced in recent years. Projections of employment growth in the study area are far more optimistic. From 2000 to 2013, a span that includes the Recession in 2008 and a slow recovery, employment in the study area grew at an average annual rate of 0.1 percent. The forecast projects employment to increase at an average annual rate of 1.4 percent through 2040.

In recent years, there has been a growing trend for business use of general aviation aircraft. As businesses expand their market areas and commercial airlines continue to contract, an increasing number of employers are relying on general aviation travel. As part of the outreach for this system plan, the types of businesses in the study area that use and rely on general aviation travel to improve their efficiency were identified. Types of employers in the study area that most often use general aviation aircraft to improve their efficiency include: government, professional services, construction, retail trade, healthcare, real estate, technical support, finance and insurance, and social services.

National Aviation Trends

National aviation trends can provide insight into future aviation activity for airports in the study area. The aviation industry has experienced and continues to experience significant change. This section discusses trends that could have an impact on aviation activity for airports in the regional system plan study area.

General Aviation Industry Trends

At the national level, fluctuating trends in general aviation usage and economic upturns/downturns have impacted general aviation demand. Slow economic recovery and economic uncertainties will continue to impact general aviation demand over the next several years. Some of the national trends that may impact aviation demand at study airports include:

- Decreases in piston aircraft, both single and multi-engine.
- Fewer active private pilots.
- Declining levels of recorded general aviation operations.
- Movement from 100LL AvGas to no-lead aviation fuel.
- Changes in manufacturing for new general aircraft.
- Escalating costs for new single-engine planes.

- Increases in business reliance on general aviation travel.
- Growth in alternative general aviation segments (sport and experimental aircraft).

Table 3-6 summarizes these trends, showing that there are both opportunities and threats for general aviation growth in the study area:

- **Opportunities for general aviation growth** — Industry trends show that the delivery of some types of general aviation aircraft is increasing. Business use of general aviation aircraft as a tool to increase efficiency and productivity also continues to grow. Because of lower entry and operating costs, industry growth is also projected for light sport and experimental aircraft. As airlines continue to consolidate and to reduce or eliminate scheduled service to smaller markets, there is an opportunity for flights on general aviation aircraft to backfill this void.
- **Threats to general aviation growth** — The single-engine piston fleet makes up the largest percentage of general aviation fleet, and FAA projects contraction of this portion of the fleet at a rate of -0.4 percent over the next 20 years. The number of active private pilots in the U.S. is decreasing as a result of new medical requirements for certification. General aviation operations at all towered airports in the U.S. decreased -3.3 percent per year between 2000 and 2013. The cost to purchase a new single-engine piston plane has increased significantly, and plans to replace 100LL fuel with a non-leaded aviation fuel will result in further reduction in the piston general aviation fleet.

Table 3-6 – National Trends Influencing General Aviation Growth

Opportunities	Threats
1. Increased Delivery of Several Aircraft Types 2013-2034 (FAA)	1. Decline in Single-Engine Piston Fleet (FAA)
Turbo Jet: 3.0% CAGR	2000: 149,400
Rotorcraft: 2.6% CAGR	2013: 123,700
Turboprop: 1.6% CAGR (Ag Sprayers large increase)	CAGR 2000-2013: -1.4%
2. Growth in Light Sport and Experimental Aircraft (FAA)	2. Decline in Active Private Pilots (FAA)
Light Sport: 4.1% CAGR	2000: 625,600
Experimental Aircraft: 1.5% CAGR	2013: 599,100
	CAGR 2000-2013: -0.3%
3. Increase in Business Flying	3. Decline in Annual GA operations at Towered Airports (FAA)
<ul style="list-style-type: none"> • Efficiency Tool 	2000: 39.9 million
<ul style="list-style-type: none"> • More consistent activity 	2013: 25.8 million
<ul style="list-style-type: none"> • Purchase more fuel 	CAGR 2000-2013: -3.3%
<ul style="list-style-type: none"> • Higher revenue generators for airports 	
4. Reduction in Cities with Scheduled Airline Service; Increased Reliance on General Aviation Travel	4. Phase Out of 100 LL AvGas fuel to non-leaded fuel

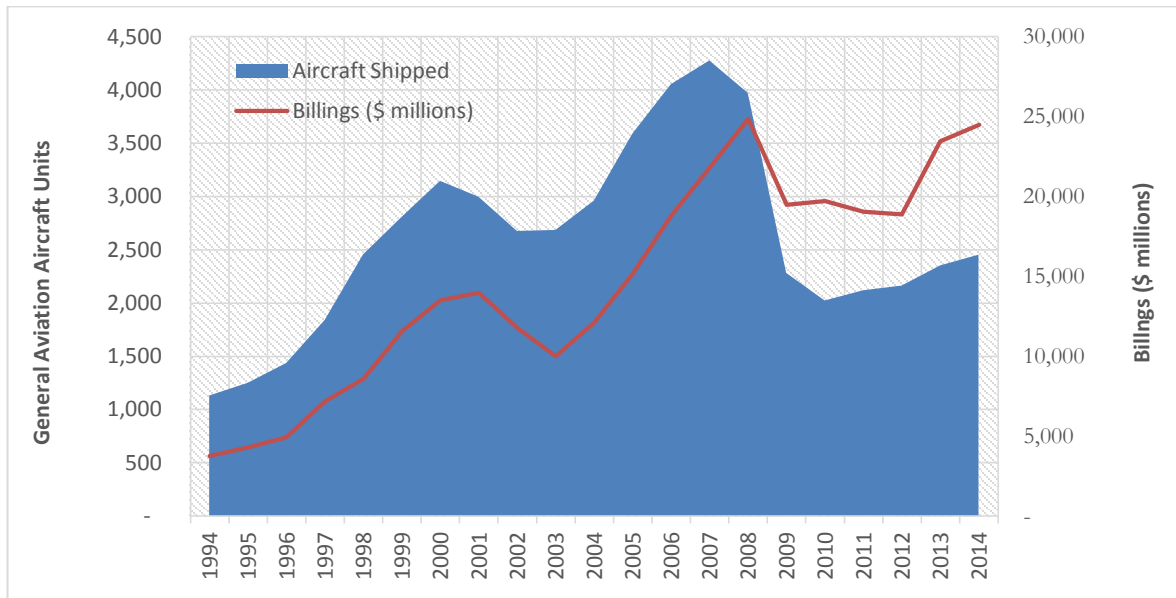
Table 3-6 – National Trends Influencing General Aviation Growth

Opportunities		Threats
5. Recent Recovery in General Aviation Shipments and Billings (GAMA)		5. Increase in Cost of New General Aviation Aircraft (aircraft manufacturers)
<u>Shipments</u>	<u>Billings</u>	Piper Seneca: \$650,000 (2006) \$1 million (2014)
2010: 2,024	2010: \$19.7M	Cessna 172 Skyhawk: \$300,000 (2005) \$400,000 (2014)
2014: 2,454	2014: \$24.5M	
CAGR 2010-14: 4.9%	CAGR 2010-14: 5.6%	

Sources: FAA Aerospace Forecast Fiscal Years 2014-2034, GAMA's 2014 General Aviation Statistical Databook and 2015 Industry Outlook.

Figure 3-5 provides supporting data for trends that are summarized in Table 3-6. As shown in Figure 3-5, the number of general aviation units being produced in the U.S. began to fall in the 2006/2007 timeframe as a result of an economic downturn and escalating fuel prices. Around 2010, production started to show modest improvement. This is one trend that implies optimism for future general aviation growth. Figure 3-5 also shows that the cost of general aviation units shipped continues to increase. While the cost of all general aviation aircraft is increasing, the cost trend line is driven by the higher percentage of aircraft in the turboprop and jet categories that are being purchased to support business travel. These trends, along with others summarized in Table 3-6, were used to inform the regional system plan's forecast.

Figure 3-5 - General Aviation Worldwide Aircraft Shipments and Billings



Source: GAMA's 2014 General Aviation Statistical Databook and 2015 Industry Outlook.

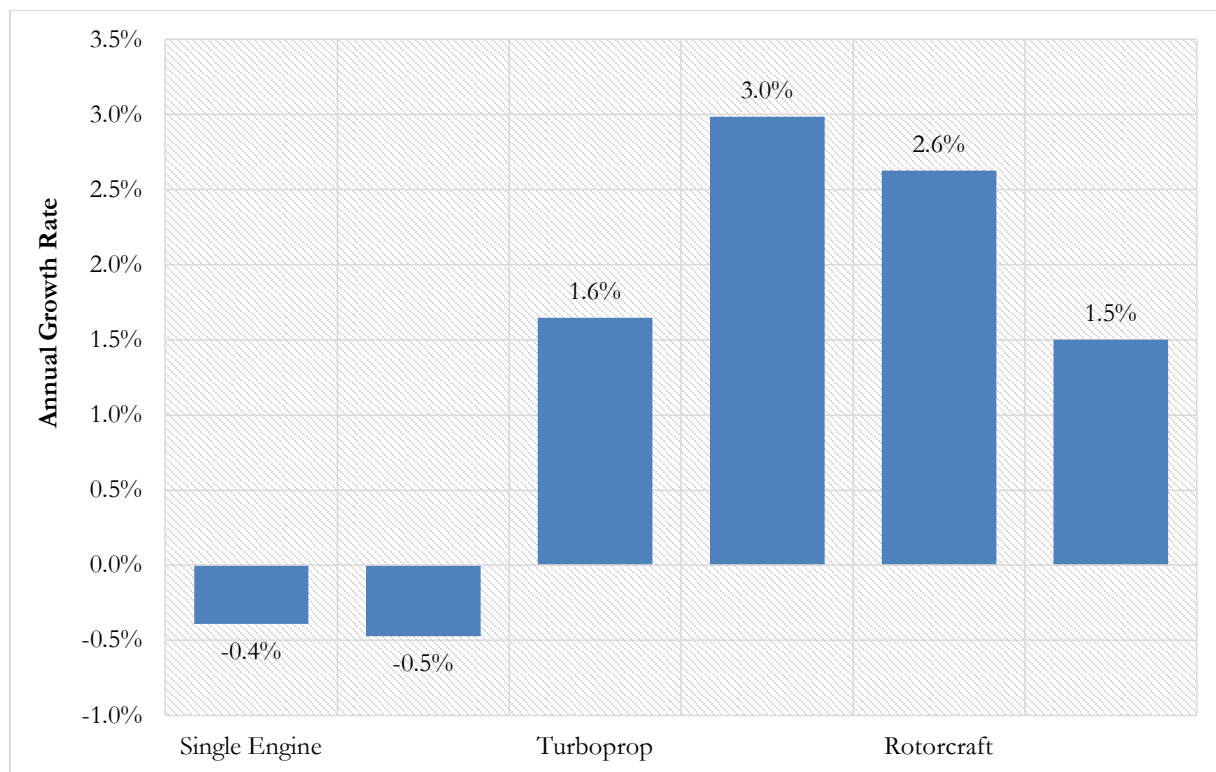
National Projections of Demand

On an annual basis, the FAA publishes aerospace forecasts that summarize anticipated trends in all components of aviation activity. Each published forecast revisits previous aerospace forecasts and updates them after examining the previous year's trends in aviation and economic activity. Many factors are considered in the FAA's development of aerospace forecasts, some of the most important of which are

U.S. and international economic forecasts and anticipated trends in fuel costs. Recent projections found in *FAA Aerospace Forecast Fiscal Years 2014-2034* were used in this analysis and are summarized below:

- The FAA estimates that the U.S. general aviation aircraft fleet will grow from an estimated 202,865 aircraft in 2013 to 225,700 aircraft in 2034. This is equal to an average annual rate of growth of 0.5 percent. The decline in the piston fleet (single-engine and multi-engine aircraft) will continue through the forecast period. The forecasted rates of growth by fleet type are presented in Figure 3-6.
- It is anticipated that total annual general aviation aircraft operations at towered airports will grow at a CAGR of 0.5 percent from 2013 through 2035.
- General aviation hours flown are projected to grow 1.4 percent per year on average over the 20-year forecast period. This higher average annual rate of growth is tied to FAA’s belief that those general aviation aircraft that remain active in the national fleet will be flown more frequently or at higher rates of utilization.

Figure 3-6 - FAA Projection of Rate of Annual Growth for U.S. General Aviation Fleet 2013-2035



Source: FAA Aerospace Forecast Fiscal Years 2014-2034.

Projections of Aviation Demand

Projections of aviation demand at the study airports for the 20-year planning period were developed using several methodologies. The results were compared and a preferred projection was selected. Three scenarios for projected based aircraft and three scenarios for projected operations are shown in this section.

The following help to set the context within which projections of aviation demand at study airports were established:

- Aviation activity at study airports, in many instances, will generally reflect the national aviation industry. The FAA projects low growth in all aspects of aviation.
- The local economy will continue to grow and population and employment will increase through the forecast period. Changes in aviation demand will most likely be not directly related to, but supported by, these increases.
- Economic disturbances may cause year-to-year demand variations.
- Fuel prices will continue to fluctuate and the future availability of 100LL fuel, needed to fly piston aircraft, may further impact the projections.
- FAA regulations may impact the distribution of aircraft within the study area.
- The military will continue to use study airports for transport and a modest amount of training activity through the forecast period.

Based Aircraft

Estimating the number and type of aircraft to be based at study airports over the next 20 years impacts the planning for future facility and infrastructure needs. Based aircraft were projected using three methodologies. The results of the forecasting scenarios are compared and one chosen as the preferred based aircraft projection. The preferred based aircraft projection for study airports is carried forward in the system planning process and is used to examine future facility needs.

It is important to note that the eight study airports that are included in the NPIAS also have forecasts of demand developed by the FAA. These forecasts are part of FAA's Terminal Area Forecast (TAF). A review of applicable projections of demand contained in the TAF showed that projections of based aircraft for several of the study airports were held constant, with no growth. As a result, it was determined that using TAF rates of growth to project future based aircraft was not an option. Projections of demand developed for NPIAS study airports for both based aircraft and annual operations are, however, compared to their TAF counterparts in this report.

The three scenarios used to develop based aircraft projections are summarized below and shown in and Table 3-7 and Figure 3-7.

Scenario 1: Constant Market Share of U.S. Active General Aviation and Air Taxi Fleet

Each airport's share of FAA's total "U.S. Active General Aviation and Air Taxi Fleet" was calculated. This scenario assumes that the study airports will maintain their share of the total U.S. fleet through the forecast period. The FAA forecast used in this analysis was published in the *FAA Aerospace Forecasts, Fiscal Years 2014-2034*. This scenario produced a 0.6 percent CAGR in total based aircraft in the study area between 2015 and 2035.

Scenario 2: Study Area Population Growth Rate

This scenario assumes that the growth of based aircraft at each study airport will be equal to the rate of overall population growth for the nine-county area. This is the rate of average annual growth forecasted by MARC's Research Services Department. The annual growth rate for based aircraft in this scenario is 1.1 percent. As shown previously, between 2010 and 2015, based aircraft all study airports actually increased at this average annual rate of growth, despite that fact that based aircraft at some of the larger airports

reportedly continued to decline (see Table 3-1). The projected average annual rate of growth for population in the study area, 1.1 percent, is similar to the actual historical rate of growth of 1.0 percent.

Scenario 3: Growth Rate Combination

As noted, employment in the nine-county study area increased at about 0.1 percent per year from 2000 to 2013. The most current MARC projections call for future employment in the area to grow at an estimated average annual average rate of growth of 1.4 percent, greater than the rate of increase anticipated for population. Given the modest historical gains in study area employment, the projected average annual rate of employment growth may be optimistic. A third projection of based aircraft was developed assuming that future growth would mirror the study area's historical average annual rate of population growth.

These three projections of based aircraft are shown in Table 3-7 and Figure 3-7.

Table 3-7 – Based Aircraft Projection Scenarios

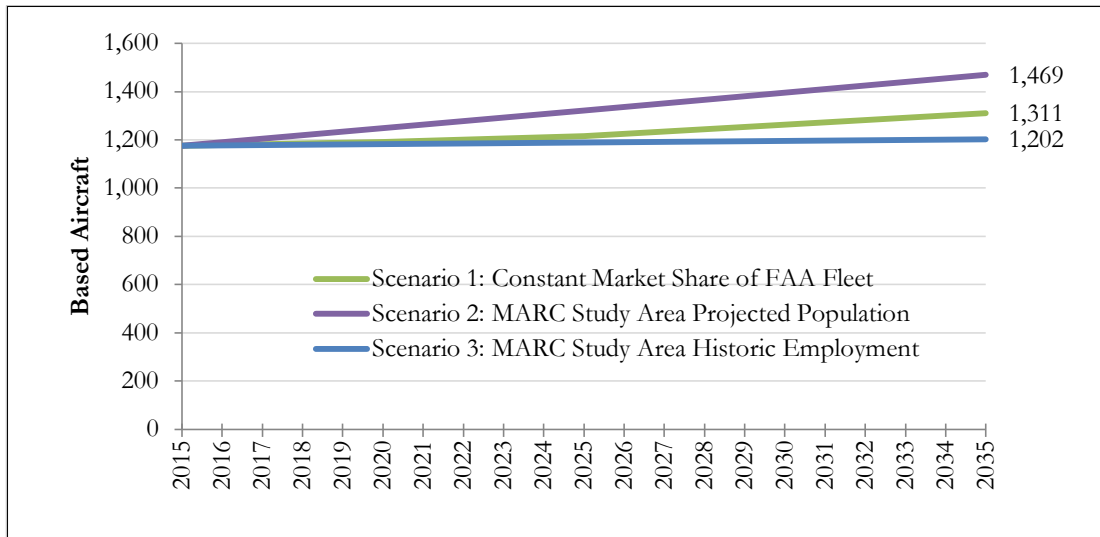
Airport	Scenario 1: Constant Market Share of FAA Fleet (0.6% CAGR*)				Scenario 2: MARC Study Area Projected Population (1.1% CAGR)			Scenario 3: MARC Study Area Historic Employment (0.1% CAGR)		
	2015	2020	2025	2035	2020	2025	2035	2020	2025	2035
Charles B. Wheeler Downtown	237	240	245	264	252	267	296	238	240	242
East Kansas City	201	203	208	224	214	226	251	202	203	206
Excelsior Springs Memorial	18	18	19	20	19	20	22	18	18	18
Gardner Municipal	104	105	108	116	110	117	130	105	105	106
Johnson County Executive	113	114	117	126	120	127	141	114	114	116
Lawrence Smith Memorial	34	34	35	38	36	38	42	34	34	35
Lee's Summit Municipal	152	154	157	170	161	171	190	153	154	155
Miami County	24	24	25	27	25	27	30	24	24	25
Midwest National Air Center	67	68	69	75	71	75	84	67	68	69
New Century Air Center	93	94	96	104	99	105	116	94	94	95
Noah's Ark	42	43	43	47	45	47	52	42	42	43
Roosterville	65	66	67	73	69	73	81	65	66	66
Sherman Army Airfield	25	25	26	28	27	28	31	25	25	26
Total	1,175	1,190	1,215	1,311	1,248	1,322	1,469	1,182	1,188	1,202

Source: Marr Arnold Planning.

Note: Totals may not sum due to rounding.

*This projection was chosen as the preferred forecast for based aircraft.

Figure 3-7 - Based Aircraft Projection Scenarios



Source: Marr Arnold Planning.

Preferred Based Aircraft Projection

“Scenario 1: Constant Share of U.S. General Aviation Fleet” was selected as the preferred projection of based aircraft for the study airports. This scenario was selected based on the following:

- The majority of aircraft based at study airports (87 percent) in 2015 are either single-engine or multi-engine piston aircraft. The *FAA Aerospace Forecasts, Fiscal Years 2014-2034* projects that these two types of aircraft will actually decline at a -0.4 percent CAGR and -0.5 percent CAGR, respectively, over the 20-year forecast period. Future limits in the availability of 100LL fuel needed for many piston aircraft may cause aircraft based at study airports to be retired, especially if the cost to switch to alternative fuels is too prohibitive. These factors dampen the outlook for future growth in based aircraft for the study area.
- Historical based aircraft at most study airports have declined over the last 15 years; however, for the 2010-2015 period, the combined study airports exhibited positive growth in based aircraft. Growth in based aircraft between 2010 and 2015 indicates that there is support for an assumption that based aircraft in the study area will exhibit a positive growth trend.
- The region has experienced growth in population (1.0 percent annually) between 2000 and 2013, compared to the general decline in based aircraft during the same period. As a result, there appears to be a limited direct correlation between based aircraft and population in the study area. However, in the 2010-2015 period, the growth in all based aircraft in the study area was similar to the area’s average annual rate of population increase. The projection of based aircraft demand shown in Scenario 2, tied to the area’s projected rate of population increase, represents an optimistic projection of future based aircraft demand.
- Employment in the study area has exhibited very modest growth. The projection of based aircraft shown in Scenario 3 provides the most conservative or pessimistic forecast and assumes that future aircraft based at study airports will only increase at an average annual rate similar to what the study area has experienced historically for employment growth.

- Assuming that Scenario 2 represents an upper bound and Scenario 3 a lower bound for future based aircraft in the study area, the average annual rate of growth between the two projections is 0.55 percent or 0.6 percent. The average annual rate of growth implied in Scenario 1 for all based aircraft is 0.6 percent.
- Scenario 1 was selected as the preferred based aircraft projection because it is consistent with rate of growth that FAA anticipates for the active U.S. general aviation fleet. For the U.S. general aviation fleet to grow at 0.6 percent each year, some areas will experience growth below this rate and some areas will experience growth above this rate. The urban setting for the system plan study area and MARC’s projections for growth in population and employment indicate that there is every reason to expect that based aircraft in the study area will increase at a rate that is at least equal to the national average.

Table 3-8 compares the preferred forecast of based aircraft for just the NPIAS study airports to the FAA’s TAF projection of based aircraft for the same eight airports. As shown in Table 3-8, for most of the study airports that are in the NPIAS, the regional system plan’s projection of based aircraft is higher than the TAF projection for 2035. That being said, when total based aircraft projected for all NPIAS study airports are compared, the regional system plan total is only 7.5 percent higher than the NPIAS total. Generally, FAA considers forecasts that are within 10 percent of their TAF projections to be acceptable. Individual differences between the TAF and the regional system plan based aircraft forecasts are attributable to the projection’s base year showing a different level of based aircraft or the TAF forecast showing no growth in based aircraft at a particular airport.

Table 3-8 – RASP and TAF Comparison of Based Aircraft Projections

Airport	2015 Actual	RASP 2035 Projection	TAF 2035 Projection	RASP Difference from TAF
Charles B. Wheeler Downtown	237	264	241	8.9%
Gardner Municipal	104	116	78	32.8%
Johnson County Executive	113	126	130	-3.1%
Lawrence Smith Memorial	34	38	31	18.3%
Lee's Summit Municipal	152	170	176	-3.8%
Miami County	24	27	17	36.5%
Midwest National Air Center	67	75	58	22.4%
New Century Air Center	93	104	116	-11.8%
Total	824	920	851	7.5%

Sources: Marr Arnold Planning, FAA *Terminal Area Forecasts*.

Fleet Mix

Total based aircraft projected for the study area over the planning period were allocated to five aircraft categories — single-engine, multi-engine, jet, helicopter and other — to develop a projection of the area’s based aircraft fleet mix through the end of the planning period. Fleet mix projections for study airports were developed based on the actual fleet mix percentages exhibited at the airports in January 2015 and the FAA Aerospace Forecast, Fiscal Years 2014-2034, projection of active general aviation aircraft by type. The preferred based aircraft fleet mix projections are shown in Table 3-9.

Table 3-9 – Based Aircraft Fleet Mix Projection

Airport	2015 Actual						2035 Projection					
	SE	ME	Jet	Heli	Other	Total	SE	ME	Jet	Heli	Other	Total
Charles B. Wheeler Downtown	115	63	53	6	0	237	91	72	88	13	0	264
East Kansas City	185	15	0	1	0	201	205	17	0	2	0	224
Excelsior Springs Memorial	16	1	0	0	1	18	17	1	0	0	2	20
Gardner Municipal	88	2	0	0	14	104	94	1	0	0	20	115
Johnson County Executive	97	13	2	1	0	113	97	15	12	2	0	126
Lawrence Smith Memorial	25	2	0	1	6	34	23	2	2	2	8	37
Lee's Summit Municipal	102	12	2	1	35	152	93	17	12	2	46	170
Miami County	22	0	0	0	2	24	24	0	0	0	3	27
Midwest National Air Center	54	9	3	0	1	67	50	10	14	0	1	75
New Century Air Center	64	11	1	1	16	93	62	13	6	2	21	104
Noah's Ark	39	0	0	0	3	42	41	0	0	0	6	47
Roosterville	63	2	0	0	0	65	70	2	0	0	2	74
Sherman Army Airfield	25	0	0	0	0	25	28	0	0	0	0	28
Total	895	130	61	11	78	1,175	895	150	134	23	109	1,311
Percent of Total	76.2	11.1	5.2	0.9	6.6	100.0	68.3	11.4	10.2	1.8	8.3	100.0

Sources: Marr Arnold Planning, *FAA Aerospace Forecast Fiscal Years 2014-2034*.

Aircraft Operations

Different factors impact the number of operations at an airport. These factors include but are not limited to total based aircraft, area demographics, activity and policies of neighboring airports, levels of flight training, and national trends. These factors were examined and three methodologies were used to develop projections of annual operations for each study airport.

A summary of the scenarios used to develop the aircraft operations is shown in Table 3-10, Table 3-11, Table 3-12 and Figure 3-8.

Scenario 1: Operations per Based Aircraft (OPBA)

OPBA is calculated by dividing the number of total operations that occur at an airport by the number of aircraft based each the airport. The OPBA ratio represents operations performed by both based and visiting aircraft. In Scenario 1, total operations at each study airport are projected by applying the airport's 2015 OPBA ratio to the preferred projection of based aircraft. Using this methodology, it is projected that total operations at study airports will grow at a CAGR of 0.6 percent over the 20-year forecast period.

Scenario 2: Regional Growth at FAA Hours Flown

This scenario applies the FAA's projected rate of growth for general aviation aircraft hours flown (derived from *FAA Aerospace Forecasts, Fiscal Years 2014-2034*) to the 2015 total operations for all study airports. Each airport's share of 2015 operations is then maintained through the forecast period and applied to the regional total to estimate operations for 2020, 2025, and 2035 by study airport. The CAGR for total operations using this methodology is 1.4 percent.

Preferred Operations Projection

The results of the two projections of operational demand, shown in Table 3-10 and Table 3-11, can be viewed as a high and low for future take-offs and landings at study airports. In the low scenario, total annual operations could increase from the 2015 level of 315,800 to 353,100 at the end of the 20-year planning period. On the other hand, if higher levels of growth are achieved, annual operations for all study airports could increase from 315,800 to 417,700.

Given that study airports are in a metropolitan area that is expected to have increases in population and employment, the lower projection is most likely too conservative. On the other hand, the higher projection reflects growth that FAA expects for the most active general aviation aircraft in the fleet, a rate of utilization that certain will not characterize all study airports.

Given the two options, the decision was made to average the high and low scenarios to arrive at a preferred operational projection. The preferred projection is shown in Table 3-12 and is also included on Figure 3-8. As shown, total annual operation for all study airports are projected to reach 358,400 in 2035. The average annual rate of growth implied in the preferred forecast is 1.0 percent. This rate of annual increase is similar to that implied in the population and employment forecasts for the study area and in FAA's projection for total annual general aviation operations at all towered airports in the U.S.

Table 3-10 – Scenario 1: Operations Per Based Aircraft

Scenario 1: Operations Per Based Aircraft (0.6% CAGR)					
Airport	2015	OPBA	2020	2025	2035
Charles B. Wheeler Downtown	70,200	296	71,100	72,600	78,400
East Kansas City	12,000	60	12,200	12,500	13,400
Excelsior Springs Memorial	4,000	222	4,100	4,200	4,500
Gardner Municipal	26,000	250	26,400	26,900	29,100
Johnson County Executive	49,500	438	50,200	51,200	55,300
Lawrence Smith Memorial	7,100	209	7,200	7,400	8,000
Lee's Summit Municipal	50,500	332	51,200	52,300	56,400
Miami County	10,000	417	10,200	10,400	11,200
Midwest National Air Center	12,100	181	12,300	12,600	13,600
New Century Air Center	43,900	472	44,500	45,400	49,000
Noah's Ark	7,300	174	7,400	7,600	8,200
Roosterville	3,500	54	3,600	3,700	4,000
Sherman Army Airfield	19,700	788	20,000	20,400	22,000
Total	315,800	269	320,400	327,200	353,100

Source: Marr Arnold Planning.

Table 3-11 – Scenario 2: GAA Hours Flown Growth

Scenario 2: GAA Hours Flown Growth (1.4% CAGR)				
Airport	2015	2020	2025	2035
Charles B. Wheeler Downtown	70,200	75,300	86,600	92,800
East Kansas City	12,000	12,900	14,900	15,900
Excelsior Springs Memorial	4,000	4,300	5,000	5,300
Gardner Municipal	26,000	27,900	32,100	34,400
Johnson County Executive	49,500	53,100	61,100	65,400
Lawrence Smith Memorial	7,100	7,700	8,900	9,400
Lee's Summit Municipal	50,500	54,200	62,300	66,700
Miami County	10,000	10,800	12,500	13,300
Midwest National Air Center	12,100	13,000	15,000	16,000
New Century Air Center	43,900	47,100	54,200	58,000
Noah's Ark	7,300	7,900	9,100	9,700
Roosterville	3,500	3,800	4,400	4,700
Sherman Army Airfield	19,700	21,200	24,400	26,100
Total	315,800	339,200	390,500	417,700

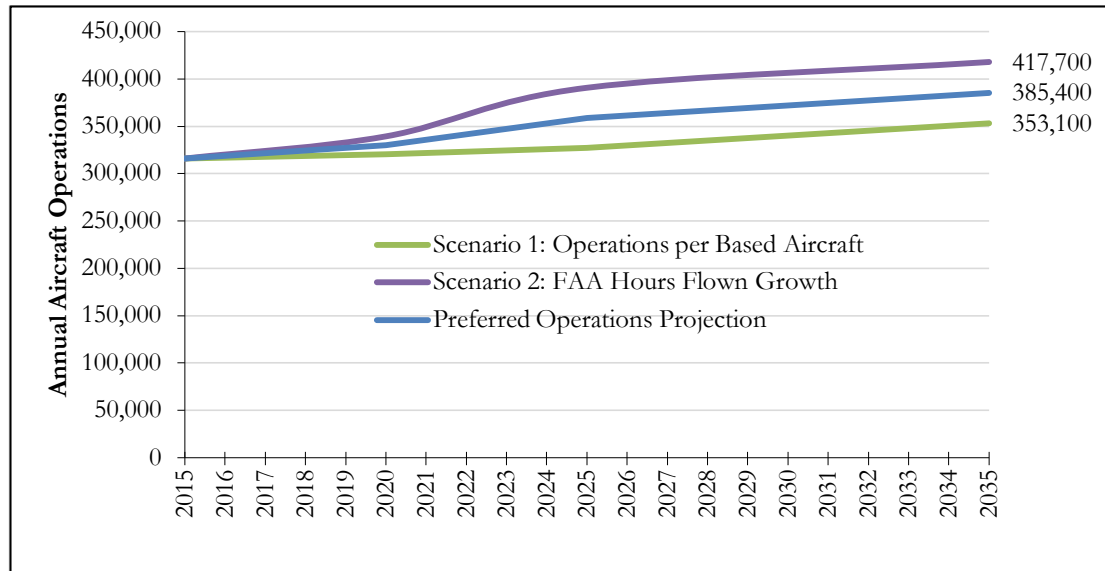
Source: Marr Arnold Planning.

Table 3-12 – Preferred Projection: Average of Scenario 1 and 2

Preferred Projection: Average of Scenario 1 and 2 (1.0% CAGR)				
Airport	2015	2020	2025	2035
Charles B. Wheeler Downtown	70,200	73,200	79,600	85,600
East Kansas City	12,000	12,550	13,700	14,650
Excelsior Springs Memorial	4,000	4,200	4,600	4,900
Gardner Municipal	26,000	27,150	29,500	31,750
Johnson County Executive	49,500	51,650	56,150	60,350
Lawrence Smith Memorial	7,100	7,450	8,150	8,700
Lee's Summit Municipal	50,500	52,700	57,300	61,550
Miami County	10,000	10,500	11,450	12,250
Midwest National Air Center	12,100	12,650	13,800	14,800
New Century Air Center	43,900	45,800	49,800	53,500
Noah's Ark	7,300	7,650	8,350	8,950
Roosterville	3,500	3,700	4,050	4,350
Sherman Army Airfield	19,700	20,600	22,400	24,050
Total	315,800	329,800	358,850	385,400

Source: Marr Arnold Planning.

Figure 3-8 - Operations Projection Scenarios



Sources: Marr Arnold Planning, *FAA Aerospace Forecast Fiscal Years 2014-2034*.

The preferred projection of annual operations for the eight NPIAS airports was compared to the FAA’s TAF projection for these same facilities. This comparison is shown in Table 3-13. As reflected in Table 3-13, the regional system plan projections of total annual general aviation operations for the NPIAS airports included in the study are comparable to those included in the TAF.

Table 3-13 – RASP and TAF Comparison of Operations Projections

Airport	2015 Actual	RASP 2035 Projection	TAF 2035 Projection	2035 RASP Difference from TAF
Charles B. Wheeler Downtown	70,200	85,600	81,424	4.9%
Gardner Municipal	26,000	31,750	26,000	18.1%
Johnson County Executive	49,500	60,350	57,149	5.3%
Lawrence Smith Memorial	7,100	8,700	7,055	18.9%
Lee's Summit Municipal	50,500	61,550	50,543	17.9%
Miami County	10,000	12,250	10,000	18.4%
Midwest National Air Center	12,100	14,800	12,058	18.5%
New Century Air Center	43,900	53,500	54,116	-1.2%
Total	269,300	328,500	304,165	7.4%

Sources: Marr Arnold Planning, *FAA Terminal Area Forecasts*.

Operational Mix

Table 3-14 through Table 3-16 details existing and forecasted 2035 operational splits of aircraft operations. In 2015, for all 13 general aviation study airports, 48 percent of operations were considered local operations, 43 percent are itinerant, 7 percent are air taxi, and 2 percent are military operations. The mix varies by airport, with only 20 percent local operations occurring at Charles B. Wheeler Downtown compared to near 100 percent at Noah’s Ark.

It is anticipated that the 2015 split of local, itinerant, air taxi, and military operations at each study airport will shift slightly over the forecast period to reflect a growing percentage of itinerant and air taxi operations.

This shift can be attributed to the anticipated decline in single-engine aircraft and the increase in business usage of general aviation compared to recreational flying by 2035. Table 3-14 through Table 3-16 details the shift by airport. As shown in Figure 3-9, by 2035, it is estimated that 43 percent of the operations will be local, 48 percent will be itinerant, 8 percent will be air taxi, and 1 percent will be military operations.

Table 3-14 – 2015 Operational Mix

Airport	2015 Operational Mix			
	Local	Itinerant	Air Taxi	Military
Charles B. Wheeler Downtown	20%	58%	20%	1%
East Kansas City	66%	23%	10%	1%
Excelsior Springs Memorial	60%	40%	0%	0%
Gardner Municipal	70%	30%	0%	0%
Johnson County Executive	38%	60%	1%	0%
Lawrence Smith Memorial	70%	28%	1%	1%
Lee's Summit Municipal	66%	30%	3%	1%
Miami County	62%	37%	0%	1%
Midwest National Air Center	66%	25%	9%	0%
New Century Air Center	43%	46%	5%	5%
Noah's Ark	100%	0%	0%	0%
Roosterville	86%	14%	0%	0%
Sherman Army Airfield	47%	47%	0%	7%
Total	48%	43%	7%	2%

Source: Marr Arnold Planning.

Note: Figures may not sum to totals due to rounding.

Table 3-15 – Projected (2035) Operational Mix

Airport	2035 Operational Mix			
	Local	Itinerant	Air Taxi	Military
Charles B. Wheeler Downtown	18%	60%	21%	1%
East Kansas City	59%	29%	11%	1%
Excelsior Springs Memorial	53%	46%	1%	0%
Gardner Municipal	63%	37%	1%	0%
Johnson County Executive	34%	63%	2%	0%
Lawrence Smith Memorial	63%	35%	2%	1%
Lee's Summit Municipal	59%	35%	5%	1%
Miami County	56%	43%	1%	1%
Midwest National Air Center	59%	31%	10%	0%
New Century Air Center	35%	54%	7%	4%
Noah's Ark	100%	0%	0%	0%
Roosterville	86%	14%	0%	0%
Sherman Army Airfield	42%	52%	0%	5%
Total	43%	48%	8%	1%

Source: Marr Arnold Planning.

Note: Figures may not sum to totals due to rounding.

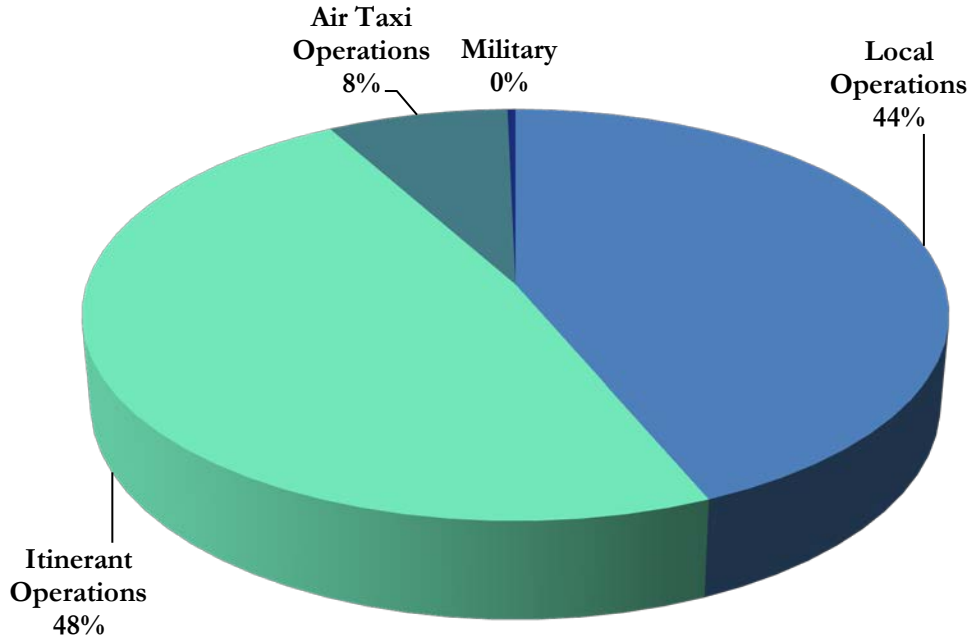
Table 3-16 – Projected (2035) Operational Mix by Type

Airport	2035 Operations by Type				
	Local	Itinerant	Air Taxi	Military	Total
Charles B. Wheeler Downtown	15,700	50,900	18,000	1,000	85,600
East Kansas City	8,600	4,300	1,600	100	14,650
Excelsior Springs Memorial	2,600	2,200	0	20	4,900
Gardner Municipal	19,800	11,700	200	0	31,750
Johnson County Executive	20,800	38,200	1,200	200	60,350
Lawrence Smith Memorial	5,400	3,000	200	50	8,700
Lee's Summit Municipal	36,400	21,500	3,100	500	61,550
Miami County	6,800	5,300	100	100	12,250
Midwest National Air Center	8,700	4,600	1,500	50	14,800
New Century Air Center	18,500	28,900	3,700	2,400	53,500
Noah's Ark	9,000	0	0	0	8,950
Roosterville	3,700	600	0	0	4,350
Sherman Army Airfield	10,200	12,600	0	1,300	24,050
Total	166,200	183,800	29,600	5,720	385,400

Source: Marr Arnold Planning.

Note: Figures may not sum to totals due to rounding.

Figure 3-9 - 2035 Projected Annual General Aviation Operations



385,400 Total Operations

Distribution of Projected Demand

Projections of demand, both for based aircraft and annual operations, on an airport-by-airport basis have the potential to be impacted by NexGen technologies. In accordance with 14 Code of Federal Regulations (CFR 91.225 and CFR 91.227, passed in May 2010) by January 1, 2020, general aviation aircraft operating in controlled airspace must be equipped with automatic dependent surveillance-broadcast (ADS-B) Out. Portable ADS-B units will not meet requirements established by the new federal Code of Federal Regulations (CFRs).

There are two basic types of ADS-B equipment, Mode S “extended squitter” transponder and universal access transceiver (UAT) equipment. Any aircraft flying above 18,000 feet MSL must be equipped with Mode S ADS-B units. By January 2020, unless FAA extends this deadline, ADS-B equipment will be required for aircraft flying in controlled (Class A, B, and C) airspace. Aircraft operating in a 30-nautical-mile ring around a primary airport with Class B airspace will also need to be equipped with ADS-B Out. In controlled (Class E) airspace, if aircraft operate above 10,000 feet MSL, they will also need to be equipped with ADS-B Out.

Figure 3-10 provides information on designated airspace classes in the study area. In addition, Figure 3-10 shows the location of all study airports in relationship to designated airspace areas. As shown in Figure 3-10, only two of the study airports, Miami County and Lawrence Smith Memorial, are located beyond Class C airspace.

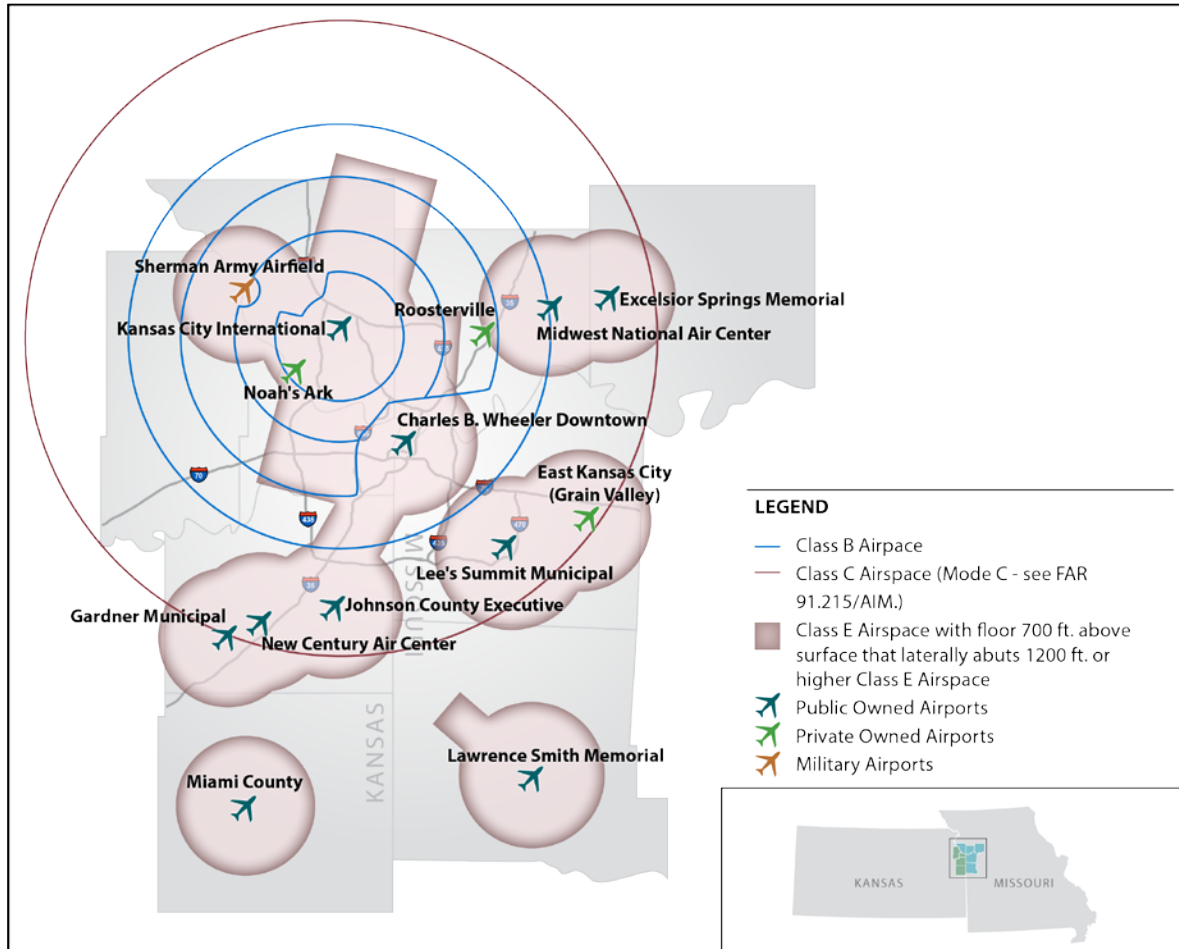
Projections for future based aircraft (Table 3-9) indicate that some airports in controlled airspace areas are expected to have based aircraft that are in the “other” category. These based aircraft are typically either light sport or experimental aircraft. There is some thought, given the nature of these aircraft, that owners may relocate to airports outside controlled airspace areas. Flying in Class E airspace below 10,000 feet MSL will not require ADS-B equipment to comply with the 14 CFR 91.225 or CFR 91.227.

For planning purposes, the system plan considers projections of based aircraft as they are presented in Table 3-9. Study airports with projected light sport and experimental aircraft in controlled airspace areas include, as shown in Figure 3-10, all but two of the study airports. As shown previously in Table 3-9, seven of the study airports that are within Class C airspace are expected to have based aircraft in the “other” category. By 2035, without a shift in the location of experimental and light sport aircraft, these airports collectively are expected to have a total of 78 based aircraft in the “other” category.

It is not a foregone conclusion that light sport and/or experimental based aircraft will relocate from airports that are in controlled airspace areas. It is just as likely that aircraft owners will equip their aircraft with ADS-B technology that will make them compliant with the January 1, 2020, CFR requirements.

MARC should work with study airports, MoDOT, KDOT and the FAA to monitor the relocation of light sport and experimental aircraft to airports beyond controlled airspace areas. Such movement may necessitate the adjustment of facility recommendations, primarily as they relate to aircraft storage, presented in the system plan.

Figure 3-10 - Designated Airspace Classes



Source: FAA, Kansas City Sectional.

Projections of General Aviation Demand for Kansas City International Airport

As previously stated, the primary focus of the system plan is on the study area's general aviation activity and needs. Kansas City International Airport (MCI) primarily serves the study area's commercial air travel and air cargo needs. This airport does, however, also accommodate some general aviation activity.

According to FAA Form 5010 for the airport, Kansas City International had three based general aviation business jets in 2014. The airport served 24,189 annual operations by general aviation aircraft in the air taxi category and 3,613 annual general aviation operations in the itinerant category.

FAA's Airport Planning Organization (APO) prepares the TAF for airports included in the NPIAS, including Kansas City International Airport. According to TAF information, between 2000 and 2014, total annual general aviation air taxi operations fell from 44,307 to 24,189. Air taxi operations at the airport peaked in 2008 at 55,781 before decreasing by more than half by 2014 to a reported 24,189 operations. Total annual itinerant general aviation operations have also been declining. Annual itinerant general aviation operations decreased from 11,930 in 2000 to 3,613 in 2014.

The most recent TAF for Kansas City International's general aviation activity is shown in Table 3-17. As shown in this table, FAA expects a modest increase in the airport's annual itinerant general aviation

operations over the next 20 years. Annual general aviation air taxi operations are expected to continue to decrease from 24,189 in 2014 to 4,214 by 2035. While the current FAA Form 5010 reports that there are three based jets at the airport, by 2035 the FAA TAF indicates that Kansas City International will not have any based general aviation aircraft.

Current facilities at Kansas City International Airport are more than sufficient to accommodate the less than 8,500 annual general aviation operations that it is expected to serve, according to the FAA, in 2035. Excess general aviation demand from Kansas City International will not need to be accommodated at other study airports over the 20-year planning period. As recently as 2000, the airport was accommodating more than 56,000 air taxi and itinerant general aviation operations. This indicates that the airport's existing facilities should be more than sufficient to serve future general aviation demand.

Table 3-17 – TAF General Aviation Projections Kansas City International Airport

Activity	2014/2015	2020	2025	2035
Air Taxi	24,189	11,289	4,006	4,214
Itinerant	3,613	4,133	4,178	4,268
Total General Aviation Operations	27,802	15,422	8,184	8,482

Sources: FAA Form 5010 and FAA Terminal Area Forecast (TAF)

As Kansas and Missouri update their state aviation system plans and as FAA updates its TAF for NPIAS airports, the preferred projections presented in this chapter should be considered. Forecasts from the regional airport system plan should also be used to inform forecasting efforts in individual airport master planning efforts.

Chapter Four: Current Airport Roles

Introduction

Current airport roles are defined differently from national, state, and local perspectives. The Federal Aviation Administration (FAA) has established two types of airport roles — those in the National Plan of Integrated Airport Systems (NPIAS), as discussed briefly in *Chapter Two: Inventory*, and specific roles for general aviation airports as identified in the FAA’s report titled *General Aviation Airports: A National Asset (ASSET)*, which was published in May 2012. For study airports, both types of FAA roles apply only to airports that are included in the NPIAS. From a state perspective, both the Kansas Department of Transportation (KDOT) and the Missouri Department of Transportation (MoDOT) have established specific roles for airports as part of their state airport systems (*Kansas Airport System Plan 2009 and Missouri State Aviation System Plan 2005*). As of January 2016, the KDOT aviation system plan is in the process of being updated.

In order to determine the roles for airports in the regional system plan, it is necessary to review FAA’s role structures and to compare the FAA classifications to KDOT and MoDOT roles established in their state aviation system plans.

FAA Roles for Study Airports

The NPIAS is the tool used by the FAA to classify airports in the U.S. that are open to the public and eligible for federal funding. Of the 3,345 airports included in the NPIAS, 389 provide commercial service and are classified as “Primary” airports. The remaining 2,942 landing facilities (which include airports, seaplane bases, and heliports) have historically been referred to as general aviation airports. Within the general aviation category, 125 of these airports are “Non-primary Commercial Service” airports; general aviation aircraft are the primary users of these airports, but they also support at least some scheduled commercial service and have between 2,500 and 10,000 annual commercial passenger enplanements. Of the general aviation airports in the NPIAS, 264 are considered “reliever” airports. Reliever airports are generally high-activity general aviation airports that provide alternatives in metropolitan areas for large commercial airports that experience operational capacity congestion.

Recognizing the unique roles played by general aviation airports throughout the U.S., the FAA conducted several studies to further classify the general aviation airports in the NPIAS. To accomplish this goal, FAA published the ASSET Study in 2012 and *ASSET 2: In-Depth Review of Unclassified Airports* in 2014. These reports did the following:

- Documented the importance of the nation’s general aviation airport system.
- Determined there was a need for additional categories or airport roles.
- Provided a description of airport characteristics of each of the four ASSET categories or roles.
- Identified factors that were included in FAA’s role-assignment process.
- Provided lists of each federal general aviation airport by ASSET category.

A summary of FAA ASSET categories or roles for general aviation airports is shown below.

- **National** (84 airports): Support the national airport system by providing communities with access to national and global markets. These airports have very high levels of activity with many jets and multi-engine propeller aircraft. These airports average about 200 total based aircraft, including 30 jets.
- **Regional** (459 airports): Support regional economies by connecting communities to regional and national markets. These airports have high levels of activity with some jets and multi-engine propeller aircraft. These airports average about 90 total based aircraft, including three jets.
- **Local** (1,268 airports): Supplement local communities by providing access to local and regional markets. These airports have moderate levels of activity with some multi-engine propeller aircraft. These airports average about 33 based propeller-driven aircraft and no jets.
- **Basic** (880 airports): Support general aviation activities, often serving aeronautical functions within the local community such as emergency response and access to remote communities. These airports have moderate levels of activity with an average of 10 propeller-driven aircraft and no jets.
- **Unclassified** (251 airports): These airports do not have a clear role, as defined by the FAA, and have a broad range of activities and characteristics that do not fit easily into one of ASSET's defined categories.

The ASSET categories were developed to provide policy makers with a better understanding of the nation's vast and diverse general aviation system. While more detailed than the previous designations for general aviation airports included in the NPIAS, reliever or general aviation, these federal categories are still broad and are determined based on a relatively small number of factors. ASSET role categories are not necessarily intended to replace airport role assignments that have been accomplished as part of a state aviation system plan. State roles for general aviation airports are generally based on a wide number of factors that consider such things as airport users, facilities, services, accessibility, and community characteristics. Further, most state systems have both public and privately-owned airports that are not included in the NPIAS, and, therefore, have no ASSET role.

As noted in *Chapter Two: Inventory*, of the 13 study general aviation airports, nine are publicly-owned and are included in the NPIAS. The remaining five airports are:

- Publicly-owned and not included in the NPIAS (Excelsior Springs Memorial).
- Privately-owned, public-use airports (East Kansas City and Roosterville).
- Privately-owned, private-use airports (Noah's Ark).
- Owned by the U.S. Department of Defense and open to the public (Sherman Army Airfield).

The nine airports in the system plan included in the NPIAS are eligible for federal funding and have ASSET classifications (with the exception of Kansas City International, which is a primary airport). ASSET roles for study airports and role assignment criteria are presented later in the chapter.

State Role Classification Process

While conducted at different times (2005 and 2009), the Missouri and Kansas state airport system plans followed the same airport role evaluation process and used similar factors to assign state airport roles. Factors such as activity, facilities, and accessibility to various socioeconomic and demographic groups were

used to determine the functional role that each airport played in its respective state system. A summary of the factors used to assign airport roles to Kansas and Missouri airports is shown in Table 4-1. Factors used by FAA in the ASSET classification process are also presented.

Table 4-1 – State Role Factors Compared to Federal Role Factors

KASP Role Factors	MoSASP Role Factors	ASSET Role Factors
Activity/Use Factors		
Total Based Aircraft	Total Based Aircraft	Total Based Aircraft
Percent of Itinerant Operations to Total Operations		Based Jet Aircraft
Based Jet Aircraft		Based Helicopters
		Instrument Operations
		International Flight Operations
		Interstate Departures
		Enplanements
		Cargo Weight
		Used by US Forest Service, US Marshalls, US Customs & Border Protection, US Postal Service or Essential Air Service
	FAA Designated “Reliever” Airport with 90 Based Aircraft	
Facility Factors		
Primary Runway Length	Primary Runway Length	None
Approach Type	Approach Type	
Fuel Facilities	Fuel Facilities	
ASOS/AWOS	Aviation Services	
	Aircraft Storage Units	
Accessibility Factors		
Registered Pilots	Registered Pilots	Located in a Metropolitan Statistical Area (MSA)
Population	Population	Distance from Nearest NPIAS Airport
Employment	Businesses	
Square Miles	Net Taxable Sales	
Gross Regional Product		
Retail Sales		

Source: *General Aviation Airports: A National Asset, Kansas Airport System Plan (KASP) 2009*, and *Missouri State Aviation System Plan (MoSASP) 2005*.

As shown, both the Kansas Airport System Plan (KASP) and the Missouri State Aviation System Plan (MoSASP) used a variety of data to evaluate and subsequently classify the airports within their state airport systems. Further, the two state plans used six of the same factors (total based aircraft, primary runway length, approach type, fuel facilities, registered pilots and population) in the role assignment process. When state role assignment factors are compared to how FAA’s ASSET study classified airports and assigned federal system roles, it is clear that the primary deciding factor in determining an airport’s ASSET role is activity. Because the FAA classified general aviation airports in all 50 states, it was limited to using data

from consistent sources for all airports. This reduced the number of factors used in FAA’s ASSET role assignment process.

State Airport Classification Descriptions

In the Kansas and Missouri airport role classification process, the nomenclature and definitions of airport roles are similar. Table 4-2 compares applicable state and federal roles for all study airports. The primary difference between the role classifications in the two state system plans is how the MoSASP classified general aviation airports that had, at the time of classification, either FAA designated “reliever” status or a Part 139 certificate. In the MoSASP, these general aviation airports were classified as “Commercial Airports” along with airports that actually accommodated schedule commercial airline flights.

Table 4-2 – Kansas and Missouri Airport Role Descriptions Compared to FAA Role Descriptions

Role Classification	Definition
Kansas Airport System Plan	
Commercial Service Airports	Accommodate scheduled commercial service
Regional Airports	Accommodate regional economic activities, connect the state and national economies, and serve all types of general aviation users
Business Airports	Accommodate local business activities and general aviation users
Community Airports	Serve a supplemental role in local economies, primarily serving small businesses, recreational, and personal flying
Basic Airports	Serve a limited role in the local economy, primarily serving recreational and personal flying
Missouri State Aviation System Plan	
Commercial Airports	Accommodate scheduled major/national or regional/commuter commercial air carrier services or relieve scheduled air carrier airports of corporate activity and provide Part 139 services
Regional Airports	Accommodate a wide range of general aviation users for large service areas outside major metropolitan areas of Missouri
Business Airports	Accommodate local business activities and general aviation users
Community Airports	Accommodate limited general aviation use, including emergency and recreational use, in small communities of Missouri
FAA ASSET (General Aviation Only)	
National	Support national and state system by providing communities with access to national and international markets in multiple states and throughout the U.S.
Regional	Support regional economies connecting communities to statewide and interstate markets
Local	Supplement local communities by providing access to intrastate and some interstate markets
Basic	Provide basic aeronautical needs in local economy

Source: *General Aviation Airports: A National Asset, Kansas Airport System Plan (KASP) 2009*, and *Missouri State Aviation System Plan (MoSASP) 2005*.

System Plan Classification Recommendations

In reviewing the FAA’s ASSET role classifications for general aviation airports and the role classifications in the most current state airport system plans for Kansas and Missouri, it was determined that the airport

role structure used in ASSET does not adequately support the needs of the regional system plan. This is primarily a result of the limited number of factors that were considered when FAA ASSET roles were assigned. Further, only NPIAS airports are included in ASSET, and five of the regional system plan study airports are non-NPIAS airports. The airport role assignment processes used in both the KASP and MoSASP followed a very similar process and considered similar factors for establishing airport roles in the respective state aviation system plans. While role assignments in ASSET were determined based on activity only, both state plans considered activity along with many other factors such as accessibility and facilities/services to assign airport roles. Therefore, for the regional system plan, the role classifications identified in both the KASP and MoSASP are carried forward, with minor changes.

Table 4-3 shows the current role assignments in the regional system plan, compared to the Kansas, Missouri, and applicable ASSET role classifications. Summaries of role adjustments for the regional system plan are as follows:

- In the MoSASP, some general aviation airports included in the state system plan are classified as “Commercial Airports.” This category includes airports that accommodate scheduled commercial airline service, FAA reliever airports, and airports with a Part 139 certificate. For the regional system plan, Missouri general aviation airports with a Part 139 certificate and/or reliever designation are classified as “Regional Airports.” This change for the regional system plan’s role classifications was made since these airports do not actually have commercial airline service. MoDOT was consulted and approved this re-classification for the regional system plan.
- There are five airports in the regional system plan that are not included in the NPIAS. Four airports are in Missouri: East Kansas City, Excelsior Springs Memorial, Noah’s Ark, and Roosterville. East Kansas City and Excelsior Springs are both included in the MoSASP, and their current MoSASP role classifications are initially maintained for the regional system plan. The remaining two privately-owned airports, Noah’s Ark and Roosterville, are not included in the current Missouri state plan. However, because of the significant number of aircraft that are based at these two airports, the decision was made (and approved by MoDOT) to include these two privately-owned airports in the regional system plan. In the regional system plan, Noah’s Ark and Roosterville are both classified as “Community Airports.”
- Sherman Army Airfield, the only non-NPIAS study airport located in Kansas, is classified in the current KASP as a “Regional” airport. Based on its current operations and other characteristics, it appears that Sherman Army Airfield is more logically classified as a “Business Airport” based on KDOT’s role classification criteria. At the time the KASP was last published, it was recommended that Sherman Army Airfield’s “public-use airport facilities” be relocated to a new airport site within Leavenworth County. The last KASP recommended that this new airport should be developed to have the characteristics of a “Regional Airport.” Currently, there are no active initiatives to develop a new public general aviation airport in Leavenworth County. As a result, the current role that Sherman Army Airfield currently plays in the regional airport system for the Kansas City Metropolitan area is more of a “Business Airport.” As a result, Sherman Army Airfield is classified as a “Business Airport” in the regional system plan. KDOT was consulted and approved this re-classification for the regional system plan.

Table 4-3 – Airport Role Classification Comparison

Airport	ASSET Role	MoSASP Role	KASP Role	Initial Regional System Plan Role
Charles B. Wheeler Downtown	National	Commercial		Regional
East Kansas City	*	Regional		Regional
Excelsior Springs Memorial	*	Business		Business
Gardner Municipal	Local		Community	Community
Johnson County Executive	Regional		Business	Business
Kansas City International	**	Commercial		Commercial
Lawrence Smith Memorial	Local	Regional		Regional
Lee's Summit Municipal	Regional	Commercial		Regional
Miami County	Local		Community	Community
Midwest National Air Center	Regional	Regional		Regional
New Century Air Center	Regional		Regional	Regional
Noah's Ark	*	****		Community
Roosterville	*	****		Community
Sherman Army Airfield	*		Regional***	Business

Source: Marr Arnold Planning.

Notes: *Airports not included in NPIAS, therefore not included in FAA ASSET.

**Commercial Service airport, therefore not included in FAA ASSET.

***Airport recommended for replacement facility/site in State Airport System Plan.

****Airport not included in State Airport System Plan.

Recommended role classifications for the regional system plan are described as follows:

- **Commercial Service** — Airports that accommodate scheduled major/national or regional/commuter air carrier service.
- **Regional** — Airports that accommodate a wide range of general aviation users and support regional economic activities.
- **Business** — Airports that accommodate local business activities and general aviation users.
- **Community** — Airports that primarily serve recreational and personal flying.

System Plan Facility and Service Objectives

With current role classifications established for study airports, the next step in the system plan is to identify the facilities and services that should ideally be available at each airport based on its assigned role. As part of the ASSET study, FAA did not identify facilities and services that should ideally be available based on each airport's ASSET role. However, both the Kansas and Missouri state airport system plans do have established role-related objectives for facilities and services. Table 4-4 presents the minimum objectives for each Kansas airport role, and the corresponding established facility and service objectives for Missouri airports are shown in Table 4-5.

Table 4-4 – KASP Facility and Service Objectives

Airport Criteria	Minimum Objective
Commercial Service Airports	
Runway Length	5,500 feet
Runway Width	100 feet
Taxiway	Full Parallel
Surface	Paved/All Weather Surface
PCI	70 or Greater
Approach Capability	Precision
Visual Aids	Rotating Beacon, Lighted Wind Sock, REILs, GVGI
Lighting	MIRL/MITL
Approach Lighting System	ALS
Weather	AWOS/ASOS/ATCT
Planning Documents	Security Plan, Snow Removal Plan
Services	Full Service FBO/Restroom/Link to Ground Transportation/AvGas and Jet A Fuel
Facilities	Terminal with Pilots' Lounge Hangars: 100% of Based Aircraft Apron: 100 feet x 100 feet Auto Parking
Regional Airports	
Runway Length	5,000 feet
Runway Width	100 feet
Taxiway	Full Parallel
Surface	Paved/All Weather Surface
PCI	70 or Greater
Approach Capability	Near-Precision
Visual Aids	Rotating Beacon, Lighted Wind Sock, REILs, GVGI
Lighting	MIRL/MITL
Approach Lighting System	ALS Desired
Weather	AWOS/ASOS/ATCT
Planning Documents	Security Plan, Snow Removal Plan
Services	Limited Service FBO/Restroom/Link to Ground Transportation/AvGas and Jet A Fuel
Facilities	Terminal with Pilots' Lounge Hangars: 100% of Based Aircraft Apron: 100 feet x 100 feet Auto Parking
Business Airports	
Runway Length	4,000 feet
Runway Width	75 feet
Taxiway	Turnarounds
Surface	Paved/All Weather Surface
PCI	70 or Greater
Approach Capability	Non-Precision
Visual Aids	Rotating Beacon, Lighted Wind Sock, REILs, GVGI
Lighting	MIRL/LITL
Approach Lighting System	ALS Desired

Table 4-4 – KASP Facility and Service Objectives (continued)

Weather	AWOS/ASOS
Planning Documents	Security Plan, Snow Removal Plan
Services	Restroom/Link to Ground Transportation/AvGas and Jet A Fuel as Needed
Facilities	Terminal with Pilots' Lounge Hangars: 100% of Based Aircraft Apron: 100 feet x 100 feet Auto Parking

Community Airports

Runway Length	3,200 feet
Runway Width	60 feet
Taxiway	Turnarounds
Surface	Paved/All Weather Surface
PCI	70 or Greater
Approach Capability	Non-Precision
Visual Aids	Wind Sock
Lighting	MIRL
Approach Lighting System	Not an Objective
Weather	AWOS/ASOS
Planning Documents	Security Plan, Snow Removal Plan
Services	Restroom/Link to Ground Transportation
Facilities	Pilots' Lounge Hangars: 100% of Based Aircraft Apron: 100 feet x 100 feet Auto Parking

Basic Airports

Runway Length	Maintain Existing
Runway Width	Maintain Existing
Taxiway	Not an Objective
Surface	Not an Objective
PCI	Not an Objective
Approach Capability	Visual
Visual Aids	Wind Sock
Lighting	Not an Objective
Approach Lighting System	Not an Objective
Weather	Not an Objective
Planning Documents	Security Plan
Services	Phone & Restroom
Facilities	Auto Parking (Maintain Existing)

Source: *Kansas Airport System Plan (KASP) 2009.*

Table 4-5 – MoSASP Facility and Service Objectives

Airport Criteria	Minimum Objective
Commercial Airports*	
ARC	C-II
Runway Length	5,500 feet
Runway Width	100 feet
Taxiway	Full Parallel
Navigational Aids	Rotating Beacon, Lighted Wind Cone/Segmented Circle, REILs, VGSI (VASIs/PAPIs)
Approach Type	Non-Precision Minimum; Precision Desired
Lighting	MIRL/MITL Minimum; HIRL/HITL with ALS Desired
Weather	Automated Weather Reporting (AWOS)
Hangar Storage	70% of Based Aircraft
Apron Tie-Downs	30% of Based Aircraft + Additional 75% for Transient Users
Terminal/Admin Building	2,500SF of Public Use Space with Public Restrooms, Conference Rooms, and Pilots' Lounge
Auto Parking	1 Space for each Based Aircraft + 50% for Employees/Visitors
Ground Communications	Public Phone, GCO
Services	Fuel-AvGas and Jet A; FBO-Full Service; Maintenance-Full Service; Rental Cars-Available
Regional Airports	
ARC	B-II
Runway Length	5,000 feet
Runway Width	75 feet
Taxiway	Full Parallel
Navigational Aids	Rotating Beacon, Lighted Wind Cone/Segmented Circle, REILs, VGSI (VASIs/PAPIs)
Approach Type	Non-Precision
Lighting	MIRL/MITL
Weather	ASOS or AWOS
Hangar Storage	70% of Based Aircraft
Apron Tie-Downs	30% of Based Aircraft + Additional 50% for Transient Users
Terminal/Admin Building	2,500SF of Public Use Space with Public Restrooms, Conference Rooms, and Pilots' Lounge
Auto Parking	1 Space for each Based Aircraft + 50% for Employees/Visitors
Ground Communications	Public Phone, GCO
Services	Fuel-AvGas and Jet A; FBO-Full Service; Maintenance-Full Service; Rental Cars-Available
Business Airports	
ARC	B-II
Runway Length	4,000 feet
Runway Width	75 feet
Taxiway	Turnarounds on each Runway End Minimum; Full Parallel Desired
Navigational Aids	Rotating Beacon, Lighted Wind Cone/Segmented Circle Minimum; REILs, VGSI (VASIs/PAPIs) Desired
Approach Type	Non-Precision

Table 4-5– MoSASP Facility and Service Objectives (continued)

Lighting	MIRL
Weather	ASOS or AWOS Desired
Hangar Storage	60% of Based Aircraft
Apron Tie-Downs	40% of Based Aircraft + Additional 25% for Transient Users
Terminal/Admin Building	1,500SF of Public Use Space with Public Restrooms, Conference Rooms, and Pilots' Lounge
Auto Parking	1 Space for each Based Aircraft + 25% for Employees/Visitors
Ground Communications	Public Phone; GCO as needed
Services	Fuel-AvGas and Jet A as required; FBO-Full Service; Maintenance-Limited Service; Rental Cars-Desired; Loaner Car-Available
Community Airports	
ARC	A-I
Runway Length	Maintain Existing
Runway Width	NPIAS-60 feet; Non-NPIAS-Maintain Existing
Taxiway	Turnarounds on each Runway End Minimum
Navigational Aids	Lighted Wind Cone/Segmented Circle Minimum; Rotating Beacon Desired
Approach Type	Visual
Lighting	LIRL Desired
Weather	None
Hangar Storage	Maintain Existing
Apron Tie-Downs	Maintain Existing
Terminal/Admin Building	Maintain Existing
Auto Parking	Maintain Existing
Ground Communications	Public Phone; GCO as needed
Services	Fuel-AvGas and Jet A as needed; FBO-Limited Service

Source: *Missouri State Aviation System Plan (MoSASP) 2005*.

Note: * Commercial Airports include reliever and Part 139 airports.

As shown in Table 4-4 and Table 4-5, the facility and service objectives for both the KASP and MoSASP are similar, with minor differences. The minor differences include:

- The KASP included objectives related to runway surface type, pavement condition index (PCI), and planning documents.
- The MoSASP included the airport reference code (ARC) and ground communications.

The recommended facility and service objectives for the regional system plan are shown in Table 4-6. It is possible that airports included in the regional system plan and assigned to a particular role may, for a variety of reasons, be unable to meet certain facility and service objectives. Further, the objectives delineated in Table 4-6 are just that — objectives. An airport's inability to meet the facility and service objective for its role does not necessarily preclude that airport from performing its designated role within the regional airport system.

As shown in Table 4-6, the facility and services objectives for the Regional and Business airport roles in the regional system plan closely mirror the objectives established in the KASP and MoSASP. As part of the regional system plan, the facility objectives for these two roles have been updated to reflect the latest FAA

design standards, per *FAA Advisory Circular 150/5300-13A, Airport Design*. In the regional system plan, airports assigned to the Community role include privately-owned airports. These privately-owned airports are not eligible for federal funding. The regional system plan determined that airports assigned to a Community role should follow objectives established in each of their respective state airport system plans. For Community airports in Missouri, this means they will follow the objectives established in the MoSASP, and Community airports located in Kansas will follow objectives established in the KASP.

Table 4-6 – Greater Kansas City System Plan Recommended Facility and Service Objectives

Airport Criteria	Minimum Objective
Regional Airports	
ARC	B-II
Runway Length	5,000 feet
Runway Width	75-100 feet
Taxiway	Full Parallel
PCI	70 or greater
Navigational Aids	Rotating Beacon, Lighted Wind Cone/Segmented Circle, REILs, VGSI (VASIs/PAPIs)
Approach Type	LPV minimum
Lighting	MIRL/MITL with ALS; HIRL/HITL Desired
Weather	ASOS or AWOS
Hangar Storage	100% of Based Aircraft
Apron Tie-Downs	20% of Busy Day Transient Aircraft
Terminal/Admin Building	2,500 sq ft with Restrooms, Conference Room, and Pilots Lounge
Auto Parking	1.5 Spaces per Based Aircraft Departures on Average Day in Peak Month
Ground Communications	Public Phone, WiFi, GCO
Services	Fuel-AvGas and Jet A; FBO-Full Service; Maintenance-Full Service; Rental Cars-Available
Business Airports	
ARC	B-II
Runway Length	4,000 feet
Runway Width	75 feet
Taxiway	Partial Parallel/Full Parallel when Justified
PCI	70 or greater
Navigational Aids	Rotating Beacon, Lighted Wind Cone/Segmented Circle, REILs, VGSI (VASIs/PAPIs)
Approach Type	RNAV, LPV desired
Lighting	MIRL
Weather	ASOS or AWOS Desired
Hangar Storage	100% of Based Aircraft
Apron Tie-Downs	20% of Busy Day Transient Aircraft
Terminal/Admin Building	1,500 sq ft with Restrooms, Conference Room, and Pilots Lounge
Auto Parking	1.5 Spaces per Based Aircraft Departures on Average Day in Peak Month
Ground Communications	Public Phone, WiFi, GCO
Services	Fuel-AvGas and Jet A; FBO-Full Service; Rental Cars-Available

Table 4-6 – Greater Kansas City System Plan Recommended Facility and Service Objectives (continued)

Community Airports		
	<u>Airports in Kansas</u>	<u>Airports in Missouri</u>
ARC	A-I	A-I
Runway Length	3,200 feet	Maintain Existing
Runway Width	60 feet	NPIAS-60 feet; Non-NPIAS- Maintain Existing
Taxiway	Turnarounds on Each Runway End	Turnarounds on each Runway End
PCI	70 or greater	70 or greater
Navigational Aids	Wind Sock	Lighted Wind Cone/Segmented Circle; Rotating Beacon Desired
Approach Type	APV 400 feet and 1 mile	Visual
Lighting	MIRL	LIRL Desired
Weather	AWOS/ASOS Desired	None
Hangar Storage	100% of Based Aircraft	Maintain Existing
Apron Tie-Downs	20% of Busy Day Transient Aircraft	Maintain Existing
Terminal/Admin Building	Pilots Lounge and Restrooms	Maintain Existing
Auto Parking	1.5 Spaces per Based Aircraft Departures on Average Day in Peak Month	Maintain Existing
Ground Communications	Public Phone, WiFi	Public Phone, WiFi, and GCO as needed
Services	Link to Ground Transportation	AvGas, Jet A as needed; FBO- Limited Service

Source: Marr Arnold Planning, *Kansas Airport System Plan (KASP) 2009*, and *Missouri State Aviation System Plan (MoSASP) 2005*.

Chapter Five: Current System Performance

Introduction

This chapter highlights how the existing system is performing. Chapter 6 uses this information to provide recommendations/actions, if necessary, for enhancing current system performance. The system's current performance is determined using framework goals and performance measures specific to this analysis. Information from this study's inventory (Chapter Two) and forecast (Chapter Three) provide input for measuring current performance. System plan goals were established using input from MARC, FAA, study airports, MoDOT, and KDOT. Greater Kansas City's metropolitan transportation plan, *Transportation Outlook 2040*, helped guide the establishment of study-specific framework goals and performance measures. This transportation plan considers sustainability components (financial, environmental and social), and the regional system plan evaluates the airport system's current performance using these same sustainability measures.

To establish current system performance, a report card is prepared that evaluates the system in relationship to various framework goals. The system is graded using performance measures that are specific to each framework goal. The regional system plan uses the following goals to establish current system performance:

1. **Economic/Financial Performance** — this framework goal considers resources study airports have in place to improve their economic vitality.
2. **Environmental Performance** — this framework goal evaluates how the system encourages environmental responsibility and compatibility. Ensuring compatible land use, protecting environmental resources, and promoting environmental sustainability are all important ways airports can be environmental stewards.
3. **Social Performance** — this framework goal evaluates the system's ability to foster social responsibility, supporting the communities it serves. Airports are often gateways to their communities and should be easily accessible and connected to the community.

Current system performance is measured using the goals listed above, combined with specific performance measures for each. Current roles for general aviation airports, defined in the previous chapter as Regional, Business, or Community were also considered in evaluating performance. Results of the system performance evaluation are discussed in the following sections.

Framework Goal #1: Economic/Financial Performance — Promote a System that Supports the Economy through Financial Viability

A healthy aviation system is characterized by airports that adopt practices that help produce operational revenues that meet or exceed operational expenses. General aviation airports, such as those included in the system plan, have limited options for generating revenue. Most frequently, general aviation airports generate revenue through leasing hangars, leasing land, or selling fuel. Many general aviation airports that are publicly-owned receive an operating budget from their owner/sponsor. Several of the general aviation airports included in this study are owned or operated by a city or county. These public entities often provide funds to help cover the cost of airport operations, if airport operating revenues fall short of expenses.

In addition to meeting operating expenses, airports also require funds for maintenance, replacement, and improvements. Some of the general aviation airports included in this study are eligible for state apportionment, discretionary, and entitlement funding from FAA and/or either MoDOT or KDOT. Some study airports are not eligible for FAA funding, but do qualify for funding from either MoDOT or KDOT. Finally, privately-owned airports included in the system plan do not qualify for funding from FAA or state/local governments.

FAA and state funds most often cannot be used to cover airport operating expenses. However, funds from local governments can be used to cover operating expenses, or they can be used to leverage state or federal grants for capital development projects. Most state and federal grants require a local match. Since most general aviation airports do not generate excess revenue, funds from local governments are often used as a source for an airport's local match for needed improvements.

Table 5-1 indicates which system plan airports are eligible for FAA and MoDOT or KDOT grants. When an airport accepts federal or state funding, it is typically required to sign various grant assurances. One of those assurances is that the airport will remain open for public operations for 20 years from grant acceptance. Privately-owned study airports are not subject to these operational grant assurances. Table 5-1 also provides background information to show which study airports have public sponsors that provide financial support; those airports that rely solely on funds from their private owners are also noted. By showing which airports have external financial resources to help fund their development or operation, the information in Table 5-1 helps to set a context for the general financial viability of individual study airports and the region's general aviation airport system.

Table 5-1 - Airport Funding Sources

Airport	Public Funding Eligibility	Rely on Only Private Funding	Eligible for FAA Funding	Eligible for State Funding
Regional Airports				
Charles B. Wheeler Downtown	EF		✓	MoDOT
East Kansas City		✓		NA
Lawrence Smith Memorial	GF		✓	MoDOT
Lee's Summit Municipal	EF		✓	MoDOT
Midwest National Air Center	EF, GF		✓	MoDOT
New Century Air Center	EF, GF		✓	KDOT
Business Airports				
Excelsior Springs Memorial	EF			MoDOT
Johnson County Executive	EF, GF		✓	KDOT
Sherman Army Airfield	GF			KDOT
Community Airports				
Gardner Municipal	GF		✓	KDOT
Miami County	GF		✓	KDOT
Noah's Ark		✓		NA
Roosterville		✓		NA

Note: EF - Enterprise Fund, GF - General Fund, NA - Not Applicable, MoDOT - Missouri Department of Transportation, KDOT - Kansas Department of Transportation

Source: FAA, KDOT, MoDOT, and City/County Annual Budgets

Using information presented in Table 5-1, the following conclusions can be drawn:

- 77 percent of all study airports are eligible from some type of local funding support from their public owners. This support comes from a General Fund, an Enterprise Fund, or both.
- 23 percent of the study airports are dependent exclusively on private funds for their operation and development.
- 62 percent of the study airports are eligible to compete for funding from the FAA for development and maintenance projects.
- 38 percent of the study airports are eligible to receive funds from KDOT and 38 percent of the study airports are eligible to receive funds from MoDOT.

The majority of study airports are eligible for local public funding, FAA funding, and state funding. Funding for operational, maintenance, and development from multiple sources helps to contribute to the financial viability of these system airports. Three study airports (23 percent) rely strictly on private funds. While not necessarily a drawback, dependency upon a single source of funding may make the longer-term financial viability of these airports less certain.

During the inventory outlined in Chapter Two, background information was collected from all study airports to identify their primary sources of revenue. This information is presented in Table 5-2.

Table 5-2 - Airports Primary Revenue Sources

Airport	Revenue Source - 1	Revenue Source - 2	Revenue Source - 3
Regional Airports			
Charles B. Wheeler Downtown	Hangar Rental	Office Rental	Ground Lease
East Kansas City	Hangar Rental	Fuel Sales	Ground Lease
Lawrence Smith Memorial	Fuel Sales	Hangar Rental	-
Lee's Summit Municipal	Fuel Sales	Ground Lease	-
Midwest National Air Center	Fuel Sales	Ground Lease	-
New Century Air Center	Building Lease	Ground Lease	Hangar Rental
Business Airports			
Excelsior Springs Memorial	Hangar Rental	Fuel Sales	-
Johnson County Executive	Building Lease	Ground Lease	Hangar Rental
Sherman Army Airfield	Aircraft Rental	Fuel Sales	Hangar Rental
Community Airports			
Gardner Municipal	Hangar Rental	Fuel Sales	-
Miami County	Fuel Sales	Building Rental	Ground Lease
Noah's Ark	Hangar Rental	-	-
Roosterville	Hangar Rental	Fuel Sales	Aircraft Maintenance

Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

As shown in Table 5-2, hangar rental, fuel sales and ground leases are the three most common sources of revenue for study airports. According to information reported by the airports as part of the regional system plan's inventory, 77 percent of the study airports benefit from hangar rental revenues, 69 percent from revenues from fuel sales, and 54 percent have revenue generated from some type of a ground lease. A ground lease could be for aviation or non-aviation use.

Airports identifying properties that can be developed to diversify and increase revenue streams

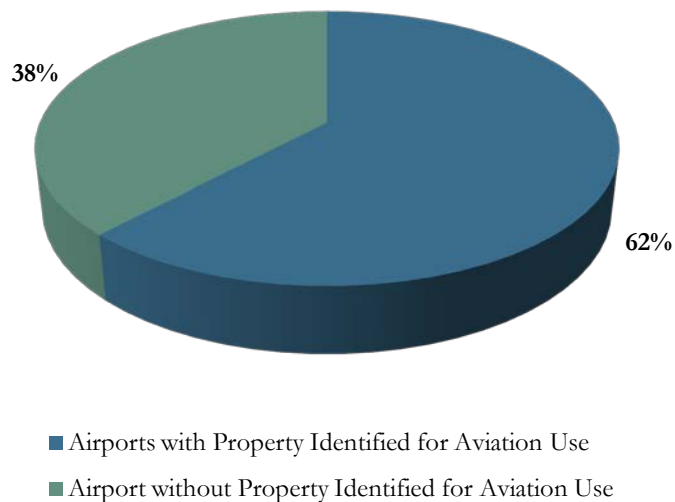
A key objective of the system plan is to help position the region with a system of airports that can sustain themselves financially. As mentioned, many general aviation airports are limited in their ability to generate revenue. One of the three primary revenue streams for study general aviation airports is leasing land for aviation related activities. Some airports also have property that is not suited to aviation development because of its location, but may be suited for lease to non-aviation tenants.

Positioning study airports to provide information to prospective aviation and non-aviation tenants could help promote financial sustainability. When airports have information that identifies available parcels and their attributes, both for aviation and non-aviation uses, it increases the likelihood of attracting new tenants and increasing revenues.

Performance Measure 1.1: Airports with on-airport land-use plans that identify properties available for aviation-related use

One means for evaluating financial sustainability is to determine which system airports have an on-airport land-use plan that identifies properties that are open and suited for aviation-related development. Generally speaking, these properties have airfield access. Based on information supplied by each study airport, 62 percent of all study airports have an on-airport land-use plan that designates properties available for aviation-related development. As noted earlier in this chapter, 54 percent of the study airports report that they currently have revenues from on-airport ground leases. Table A-1 in Appendix A identifies these airports, and Figure A-1 summarizes system performance for this measure, illustrating that 83 percent of airports assigned to the Regional role, 33 percent of airports in the Business role, and 50 percent of airports in the Community role currently have on-airport land-use plans that readily identify which properties are open for aviation-related development. Increasing this percentage could increase system financial viability. Figure 5-1 summarizes current system performance for this measure. It is worth noting that circumstances at individual study airport may make it impractical for them to achieve this objective.

Figure 5-1 - Airports with Property Identified for Aviation Use



Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

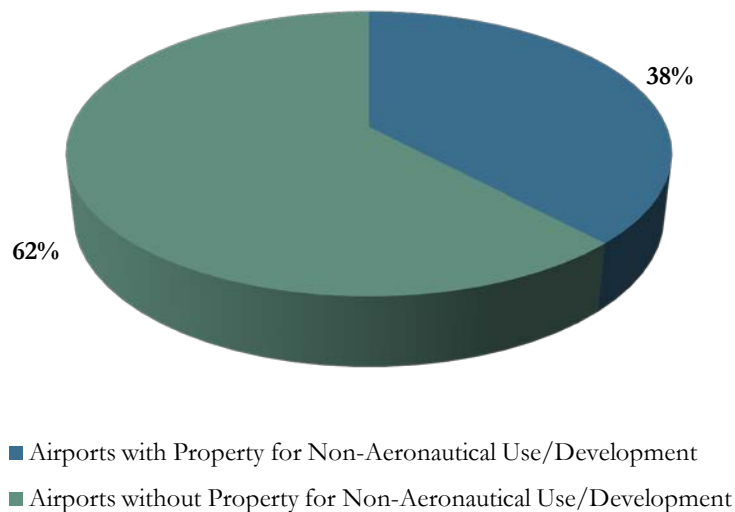
Performance Measure 1.2: Airports with an on-airport land-use plans that identify properties available for non-aeronautical activities

As part of airport master planning or other planning processes, some airports determine that they have property in excess of their long-term aeronautical needs. Most often, these properties do not have airfield access. Sometimes these areas are leased for agricultural activities, but they can also attract tenants who provide annual revenue through a land lease. Attracting non-aviation related tenants can increase an airport’s financial sustainability.

System-wide, only 38 percent of the study airports have land-use plans that designate parcels open for development for prospective non-aviation tenants. Chapter 6 addresses the need to improve current performance for this measure. As noted, ground leases are one of the top three revenue streams for system airports, so increasing this source of revenue for all study airports may enhance financial sustainability.

Table A-2 in Appendix A indicates which airports have taken steps to identify properties that are open for non-aeronautical use. Figure A-2 summarizes system performance by airport role for this measure. As Figure A-2 shows, 67 percent of Regional Airports, 33 percent of Business Airports and no Community Airports report having land-use plans that designate which properties are open for non-aeronautical uses. Figure 5-2 summarizes current system performance for this measure.

Figure 5-2 - Airports with Property for Non-Aeronautical Use/Development



Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

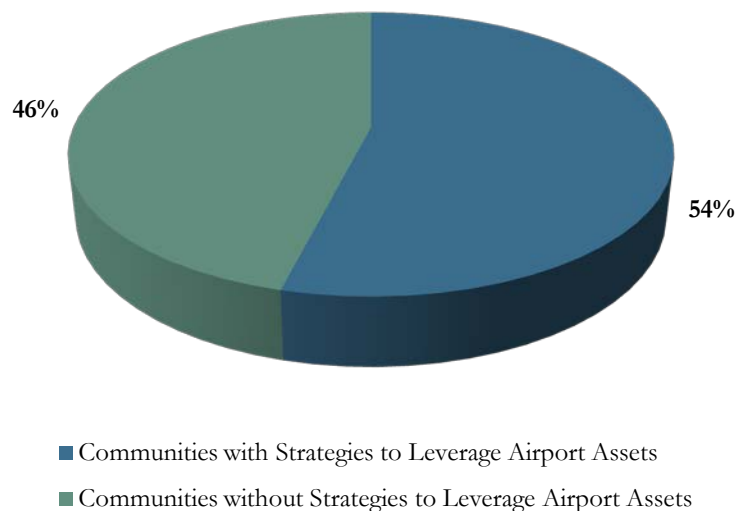
Performance Measure 1.3: Airports/Communities with strategies to encourage aviation-related development in the airport environs

Some types of businesses and employers benefit from being located near a general aviation airport. While airports do not receive direct revenues from off-airport businesses that may be aviation dependent, they sometimes receive indirect benefits from these employers. For example, nearby businesses might rent aircraft to support their travel needs, or have customers or suppliers who use general aviation planes to visit them. These activities help to increase demand, leading indirectly to increased airport revenues.

Another benefit of having aviation-dependent businesses in the immediate airport environs relates to compatibility. Airports benefit when surrounding land use is compatible with airport operations and development. Airports typically have enhanced land-use compatibility, according to the FAA, when activities near the airport are not noise sensitive. Business and light industry in proximity to airports is typically considered a compatible use. As a result, if airports and communities act together to attract aviation-dependent businesses to the airport environs, it promotes compatible land use and may contribute to financial sustainability by adding to airport revenue. System-wide, more than 50 percent of communities near study general aviation airports have taken steps to use airport assets to attract airport compatible development to the airport environs. Chapter 6 identifies possible options for increasing system performance in this category.

As part of the study inventory, airports provided data on which communities have taken action to identify properties in the airport environs suitable for aviation-dependent businesses. Table A-3 and Figure A-3 in Appendix A summarize this information. Currently, 67 percent of Regional Airports, 33 percent of Business Airports, and 50 percent of Community Airports meet this measure. Figure 5-3 recaps current system performance for this measure.

Figure 5-3 - Communities with Strategies to Leverage Airport Assets to Attract Aviation-Dependent Businesses to the Airport Environs



Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Framework Goal #2: Environmental Performance — Promote a System that Encourages Environmental Compatibility

Another important part of sustainability relates to the environment. Airports using federal funds are required to assess potential environmental impacts related to improvement and expansion projects. Awareness on ways general aviation airports can reduce their impacts on the environment, as it relates to their day-to-day operations, has only more recently started to get traction. While many large commercial airports have programs to address operational environmental sustainability, few general aviation airports

have such strategies in place. This section of the system performance evaluation examines various facets of airport environmental sustainability.

Airports with surrounding jurisdictions that have enacted airport-appropriate compatible land-use controls and height zoning restrictions

Performance Measure 2.1: Airports included in locally adopted land-use plans

Table 5-3 shows which airports are incorporated in local land-use or comprehensive plans, along with the local jurisdiction(s) responsible for preparing that plan. Table 5-3 also shows each study airport's land-use designation within its respective plan. As the table shows, jurisdictions use different land-use categories to designate airport property. Airport land-use designations should be jurisdiction-appropriate and afford the airport maximum protection from encroachment.

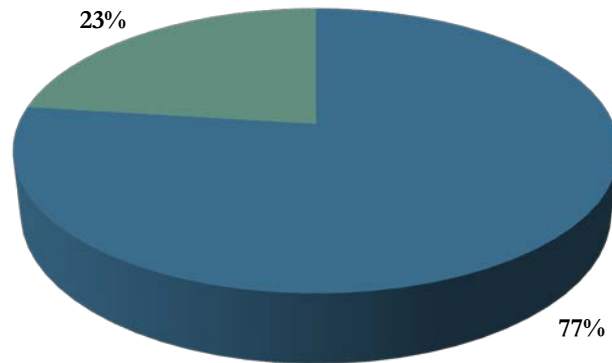
When airports are included in local land-use or comprehensive plans, it is generally in the transportation component of the plan. When an airport is included in a local comprehensive plan, it generally indicates there is a working relationship between the airport and the community or communities surrounding the airport. As Figure A-4 shows, 83 percent of Regional Airports, 100 percent of Business Airports, and 50 percent of Community Airports report being included in local land-use or comprehensive plans. System-wide, 77 percent of the study airports report being included in local land-use or comprehensive plans

Table 5-3 - Airports Included/Recognized in Local Land-Use or Comprehensive Plans

Airport	Included in Local Comp Plan	Local Jurisdiction	Airport Land Use Designation
Regional Airports			
Charles B. Wheeler Downtown	Yes	Clay County	Transportation
East Kansas City	No	City of Grain Valley	Business Park
Lawrence Smith Memorial	Yes	City of Harrisonville	Agricultural
Lee's Summit Municipal	Yes	City of Lee's Summit	Agricultural
Midwest National Air Center	Yes	Clay County	Airport
New Century Air Center	Yes	Johnson County	Industrial
Business Airports			
Excelsior Springs Memorial	Yes	City of Excelsior Springs	Airport
Johnson County Executive	Yes	Johnson County	Agricultural
Sherman Army Airfield	Yes	Dept. of Army	Airport
Community Airports			
Gardner Municipal	Yes	City of Gardner	Agricultural
Miami County	Yes	Unincorporated Miami County	Airport
Noah's Ark	No	Platte County	Agricultural
Roosterville	No	Clay Co., City of Liberty, Kansas City	Residential

Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Figure 5-4 - Airports Included/Recognized in Local Land-Use or Comprehensive Plans



- Airports Included/Recognized in Local Land-Use or Comprehensive Plans
- Airports Not Included/Recognized in Local Land-Use or Comprehensive Plans

Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

As Figure 5-4 shows, there are some airports in the region that are not included in local comprehensive plans for their surrounding community or communities. As the region’s Metropolitan Planning Organization (MPO), MARC may be able to play a role in improving system performance for this measure.

Performance Measure 2.2: Communities providing airports with some form of compatible land-use protection

The sustainability of study airports is enhanced if activities and land use in the immediate environs of the airports are both compatible with the airport, its potential expansion needs, and its daily operations. Since airports do not control land use beyond their property boundaries, airports must rely on the jurisdictions that surround them to take steps to provide land-use compatibility. Communities employ different mechanisms to promote compatible land use.

Table 5-4 - Current Land-Use Control and Height Zoning by Airport and Jurisdiction

Airport	NPIAS Airports	Planning Jurisdiction(s)	Adopted Height Restriction Ordinance	Land Use Controls
Commercial Airports				
Kansas City International	Yes	Kansas City, MO	No	Yes
		Ferrelview, MO	No	No
		Parkville, MO	No	Yes
		Platte City, MO	Yes	Yes
		Weatherby Lake, MO	No	No
		Platte County, MO	Yes	Yes
Regional Airports				
Charles B. Wheeler Downtown	Yes	Kansas City, MO	No	Yes
		North Kansas City, MO	No	Yes

Table 5-4 - Current Land-Use Control and Height Zoning by Airport and Jurisdiction

Airport	NPIAS Airports	Planning Jurisdiction(s)	Adopted Height Restriction Ordinance	Land Use Controls
		Kansas City, KS	No	Yes
East Kansas City	No	Grain Valley, MO Jackson County, MO Blue Springs, MO	No No No	Yes Yes Yes
Lawrence Smith Memorial	Yes	Harrisonville, MO Cass County, MO	No Yes	Yes Yes
Lee's Summit Municipal	Yes	Lee's Summit, MO Unity Village, MO Kansas City, MO	Yes No No	Yes No Yes
Midwest National Air Center	Yes	Clay County, MO Kearney, MO Mosby, MO Excelsior Springs, MO Prathersville, MO	Yes No No No No	Yes Yes No Yes No
New Century Air Center	Yes	Johnson County, KS Gardner, KS Olathe, KS	Yes Yes Yes	Yes Yes Yes

Business Airports

Excelsior Springs Memorial	No	Excelsior Springs, MO Ray County, MO	No Yes	Yes No
Johnson County Executive	Yes	Johnson County, KS Olathe, KS Overland Park, KS	Yes Yes Yes	Yes Yes Yes
Sherman Army Airfield	No	Ft. Leavenworth, KS Leavenworth County, KS City of Leavenworth, KS Weston, MO Platte County, MO	No Yes Yes No Yes	Yes Yes Yes No Yes

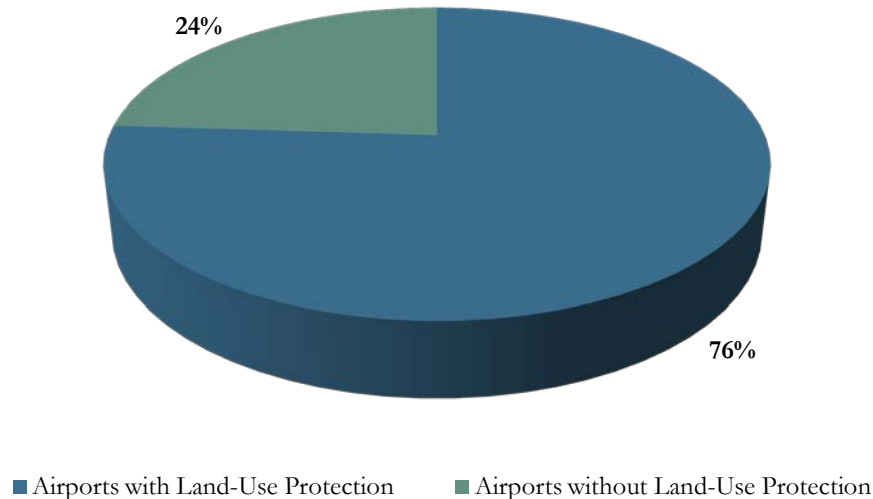
Community Airports

Gardner Municipal	Yes	Gardner, KS Edgerton, KS Johnson County, KS	Yes No No	Yes Yes Yes
Miami County	Yes	Miami County, KS Osawatomie, KS	Yes No	Yes No
Noah's Ark	No	Waldron, MO Lansing, KS Platte County, MO Parkville, MO Leavenworth County, KS Farley, MO	No No Yes No Yes No	No Yes Yes Yes Yes No
Roosterville	No	Clay County, MO Liberty, MO Kansas City, MO	No No No	Yes Yes Yes

Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Table 5-4 shows which jurisdictions surrounding study airports have taken steps toward providing land-use compatibility controls in the airport environs. Figure 5-5 summarizes current system performance as it relates to this particular measure. There are 37 different municipalities that border study airports. As Figure 5-5 shows, on a system-wide basis, 76 percent of all municipalities surrounding study airports report they have controls to support compatible land use in the airport environs and 24 percent do not.

Figure 5-5 – Land-Use Control and Height Zoning in Place by Local Jurisdiction



Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Performance Measure 2.3: Communities with adopted height zoning to make airports compatible with FAA 14 CFR Part 77

As part of its design standards for airports that are eligible for federal funding, FAA has established a series of elevated surfaces around airports that should be free of height penetrations. These surfaces have been established to promote pilot and operational safety and to reduce the chances of an incident in the airport operational environment. Dimensions for 14 CFR Part 77 Surfaces vary based on runway approach type, and they can vary by runway end. The more precise the runway approach, the greater the distance from the runway end included in the airport’s Part 77 Surfaces.

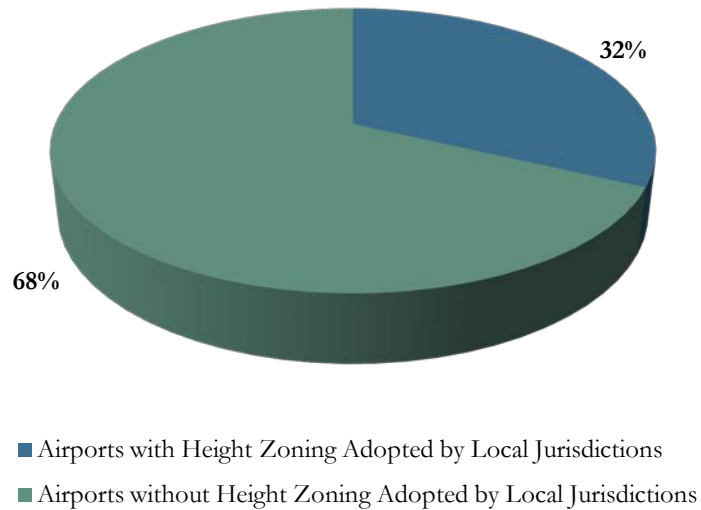
When airports are eligible for FAA grants, one of the grant assurances that they commit to is keeping their Part 77 Surfaces clear of obstructions. Since several of the regional system plan study airports are not eligible for FAA funding, these airports are not required to be Part 77 compliant. But even for non-federally funded airports, having height restrictions in the airport environs equates to best airport practices.

Height restrictions in the airport environs that make an airport compatible with Part 77 requirements increase the airport’s compatibility and environmental sustainability. Table 5-4 also shows which jurisdictions have enacted height zoning restrictions.

As Table 5-4 shows, some NPIAS study airports have surrounding jurisdictions that have not taken steps to adopt Part 77 height zoning restrictions. This is an area where MARC should work with jurisdictions to improve performance on this measure.

As Figure 5-6 shows, 32 percent of all nearby municipalities report they have height zoning and 68 percent do not.

Figure 5-6 - Jurisdictions with Height Zoning



Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Performance Measure 2.4: Airports with published noise contours

There are no federal, state, or local requirements for general aviation airports to have a published noise contour. However, often as a result of an airport master plan or an environmental assessment, some airports do. Airport noise contours are typically generated using the Integrated Noise Model (INM). This model replicates cumulative day and night noise exposure impacts expressed in decibels. Airport noise contours are centered on each airport’s runway system. Often, if annual operations at the airport are limited in volume and are restricted to small single-engine aircraft, noise contours do not extend beyond airport property.

From a community standpoint, there can be a difference between perceived airport noise impacts and measurable noise impacts. According to FAA and HUD guidelines, noise impacts are typically an annoyance when they reach a sustained level of 65 decibels or greater. Most general aviation airports do not generate this level of measurable noise. However, because neighbors can see and hear low-flying general aviation planes, they may perceive airport operations to have a negative noise impact.

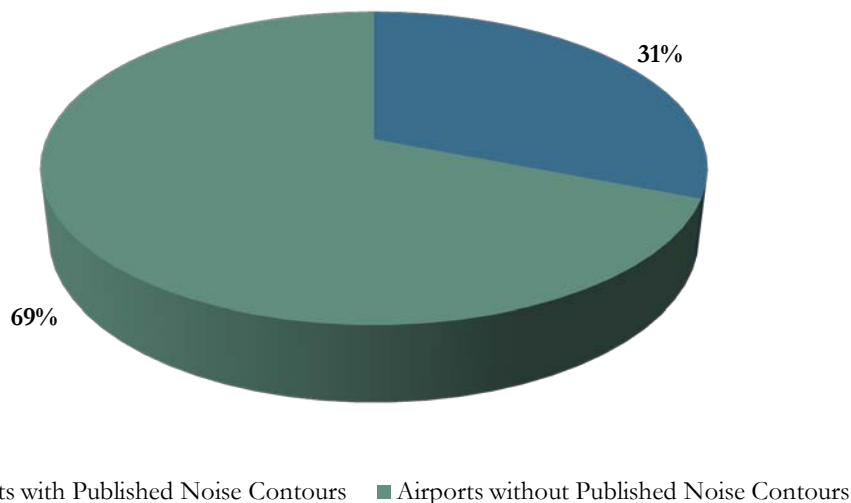
Noise contours are one way to help enhance an airport’s environmental compatibility. If airport noise contours do extend beyond airport property, areas within these contours can be designated for activities and uses that are compatible with identified levels of airport related noise when local land-use and comprehensive plans are prepared. When houses are built or sold in the airport environs, environmental compatibility can be increased if buyers recognize that they are purchasing property near an airport, especially if that property falls within an established noise contour.

As shown in Table A-5 in Appendix A, very few of the study airports report having a noise contour map, and for those airports that do report having a contour, the contours are not current. Noise contours for an

airport change when there are increases or decreases in total annual operations and/or there is a change in the mix of aircraft that use the airport. Increases or decreases in business jets and larger twin-engine planes can result in a change to an airport’s noise contour.

Figure A-5 in Appendix A and Figure 5-7 summarize system performance for this measure, which is low. In fact, given the age of the existing noise contours, it is probably more accurate to conclude that none of the study airports have a current noise contour map. There is a cost involved to develop a noise contour map. FAA seldom funds a noise contour map independently from an airport master plan or environmental assessment, and the privately-owned study airports would never be eligible for an FAA-funded noise contour map. As noted, for less active study airports, noise contours seldom extend beyond airport property. The cost and benefit of study airports having current noise contour maps as a means to promote environmental sustainability will be discussed in Chapter 6.

Figure 5-7 - Airports with Published Noise Contours



Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Airports that have an environmental inventory to facilitate approval and permitting

When airports need to expand to accommodate additional landside or airside facilities, it can be beneficial if the airport has a general concept of environmental features, either on-airport or off-airport, that have the potential to impede or limit expansion. Performance measures considered in this section report baseline information so that study airports can increase their environmental knowledge. When airports are more fully aware of their environmental settings, they can be more proactive in terms of how their daily activities and any possible development plans may impact the environment.

Performance Measure 2.5: Airports that have conducted an environmental assessment

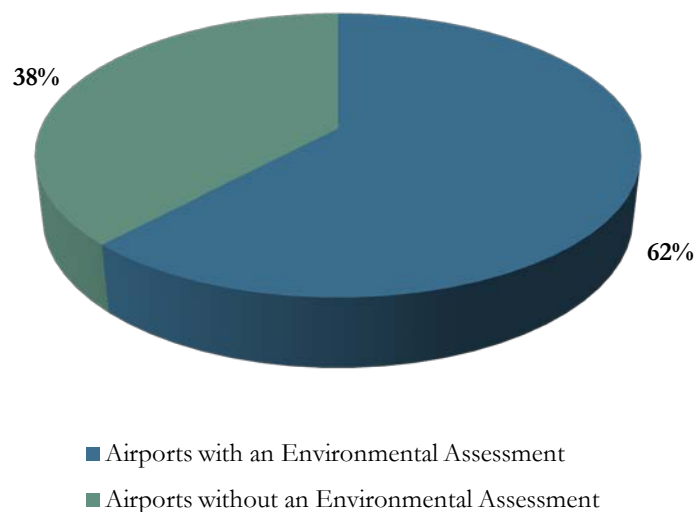
For larger-scale development projects, airports using FAA funds are typically required to conduct an environmental assessment. Airport-related environmental assessments are completed following FAA Orders 5050.4B and 1050.1E. Following these Orders, 20 different categories are evaluated to determine if there could be potential impacts to the environment from project implementation. If a study airport has

conducted an environmental assessment, then the airport has an inventory of its important environmental features, both on- and off-airport. When airports have an understanding of sensitive environmental areas, they become better stewards for sustaining the environment.

Table A-6 in Appendix A shows that only publicly-owned study airports have completed environmental assessments. If expanding, privately-owned airports may need to comply with local permitting and approvals, but these locally mandated steps would not require the privately-owned airports to consider a full range of different facets of the environment.

Figure A-6 in Appendix A summarizes which study airports, by system role, have completed environmental assessments that provide them with information on their environmental surroundings. While most of the Regional Airports have completed environmental assessments, no Business Airports report that they have undertaken an environmental assessment. Half of the Community Airports indicated they have completed an environmental assessment. As Figure 5-8 shows, system-wide, 62 percent of all study airports report that they have an environmental inventory as a result of a completed environmental assessment.

Figure 5-8 - Airports with an Environmental Assessment



Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

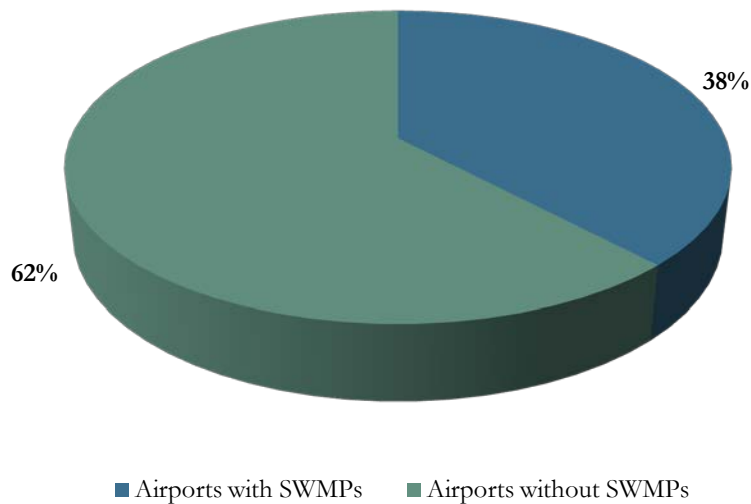
Performance Measure 2.6: Airports with a stormwater management plan

Some local jurisdictions require the development of a Stormwater Management Plan (SWMP). Since airports often have many paved areas which contribute to runoff, they may be required to have SWMPs. Having such a plan makes the airport a better environmental partner. Table A-7 in Appendix A shows those airports that report that they have prepared SWMPs. Most of the study airports with SWMPs have prepared these plans recently.

Figure A-7 in Appendix A summarizes system performance as it relates to study airports that have SWMPs. The majority of Business Airports (67 percent) report having an SWMP. None of the Community Airports report having an SWMP, and there are several publicly-owned airports that do not have an SWMP. As Figure 5-9 shows, system-wide, 38 percent of all study airports have a Stormwater Management Plan to

support environmental stewardship and sustainability. The need to develop an SWMP is typically mandated by the airport’s local jurisdiction. Such plans are usually not federally mandated but can be state mandated. Chapter 6 of the regional system plan sets a target for which study airports should ideally have a Stormwater Management Plan.

Figure 5-9 - Airports with a Stormwater Management Plan (SWMP)



Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Performance Measure 2.7: Airports with a wildlife hazard assessment

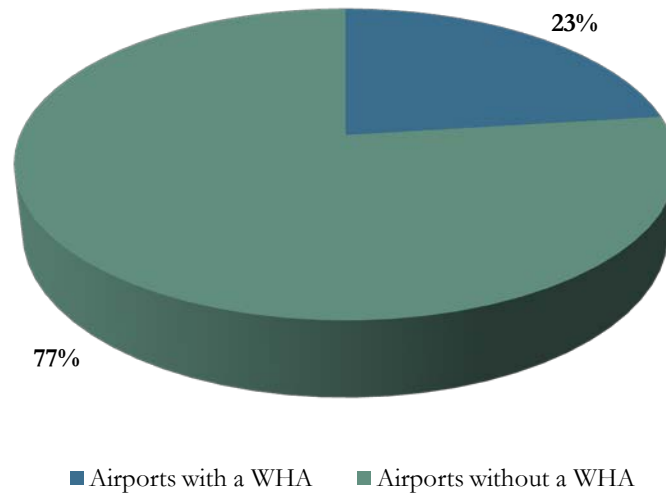
When airports that are eligible for FAA funding find evidence that wildlife incursions or bird strikes have occurred, their first step is typically to secure federal funding to complete a Wildlife Hazard Assessment (WHA). Such plans investigate the airport’s surroundings and features that may attract wildlife or birds, either to the airport itself or to its environs. Based on the findings from a WHA, the airport may proceed to develop a full Wildlife Hazard Management Plan to mitigate wildlife incursions.

Since privately-owned and non-NPIAS airports are not eligible for FAA funding, study airports in these categories will not have undertaken a WHA. Table A-8 in Appendix A provides a summary of which study airports indicate that they have undertaken a WHA. Figure A-8 in Appendix A summarizes, by airport role and for the system as a whole, which study airports have completed a WHA. As noted, a WHA is typically not undertaken unless there are reports or evidence of wildlife issues at an airport. The FAA has a fairly extensive program at federally funded general aviation airports to educate pilots on procedures to report wildlife incursions and bird strikes. These incidents often go unreported, so it takes cooperation from pilots using each airport to identify potential wildlife issues.

Since FAA’s educational efforts on wildlife incursion incidents are focused on federally funded airports, there may be an opportunity to expand similar educational efforts to all study airports. Opportunities for making study airports better environmental stewards related to this performance measure are discussed in Chapter 6.

As Figure 5-10 indicates, only 23 percent of all study airports report they have completed a wildlife hazard assessment.

Figure 5-10 - Airports with a Wildlife Hazard Assessment



Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

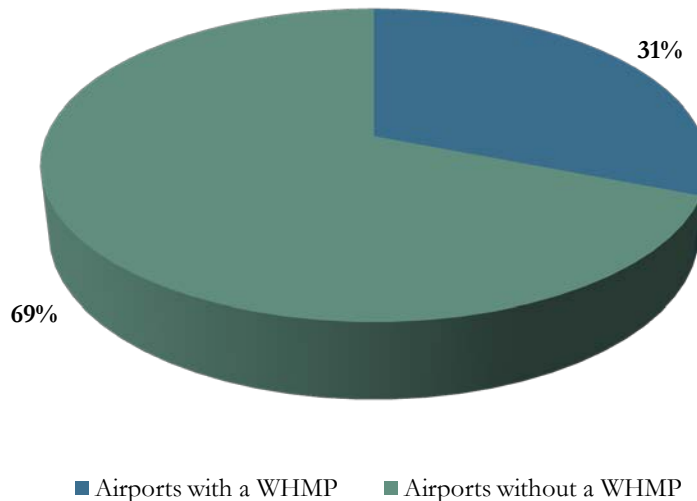
Performance Measure 2.8: Airports that have completed a wildlife hazard management plan

Wildlife Hazard Management Plans (WHMP) are typically mandated by the FAA if a federally funded airport has a history of wildlife incursions. WHMPs are often prepared by wildlife biologists with the United States Department of Agriculture (USDA) or they may be prepared by a consultant with expertise in this area. WHMPs are not required for most FAA-funded airports, but they are required for airports that have a Part 139 certification. These plans outline the specific steps an airport should take to mitigate wildlife strikes on or near the airport. A full WHMP is typically preceded by a WHA, which determines if there is a need for a WHMP. FAA funds both studies for eligible public airport.

Table A-9 in Appendix A shows which study airports report that they have WHMPs. For those airports that completed a WHA, but did not follow with a WHMP, this finding indicates that the airport’s impact on surrounding wildlife was not significant.

Figure A-9 in Appendix A summarizes system performance for this measure. None of the privately-owned airports included in the regional system plan report having a WHMP. Since WHMPs are typically prepared when a number of wildlife incursions have been reported on a continual basis, it may not be necessary even for all FAA-funded airports to have such a plan. When airports do, however, have issues with wildlife, these plans are an appropriate step to help increase the airport’s environmental stewardship, sustainability, and safety. As Figure 5-11 shows, 15 percent of all study airports have completed a WHMP.

Figure 5-11 - Airports with a Wildlife Hazard Management Plan (WHMP)



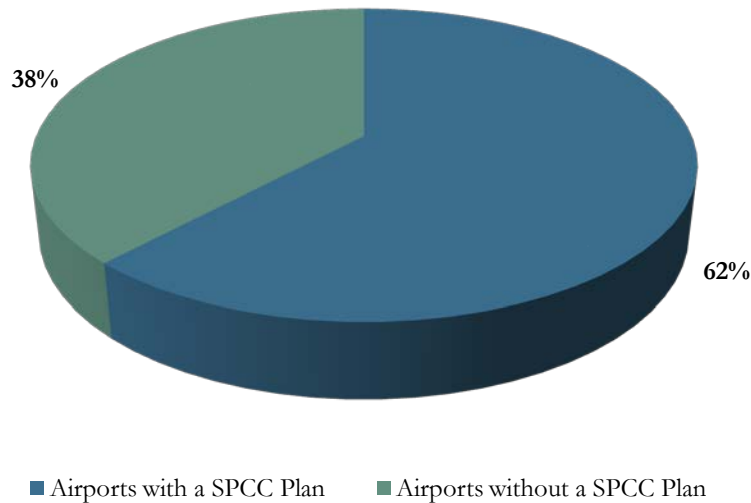
Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Performance Measure 2.9: Airports with a Spill Prevention, Control and Countermeasure Plan (SPCC)

Another means for measuring environmental compatibility and sustainability for study airports is determining which airports have a plan in place to respond if they have a spill incident. This particular performance measure examines airports that have plans in place to address possible spills that could compromise the environment. Table A-10 in Appendix A depicts those airports that report that they have a Spill Prevention, Control, and Countermeasure plan (SPCC). These plans are most often locally mandated, and both publicly- and privately-owned airports report that they have SPCC plans.

Figure A-10 in Appendix A summarizes system performance for this particular measure. Most Regional Airports report having SPCC plans, but most Business Airports do not. As shown in Figure 5-12, system-wide, 62 percent of the study airports report that they have SPCC plans. Increasing the percentage of study airports that have SPCC plans would provide an opportunity to increase the environmental sustainability and compatibility of the airport system.

Figure 5-12 - Airports with a Spill Prevention, Control and Countermeasure (SPCC) Plan



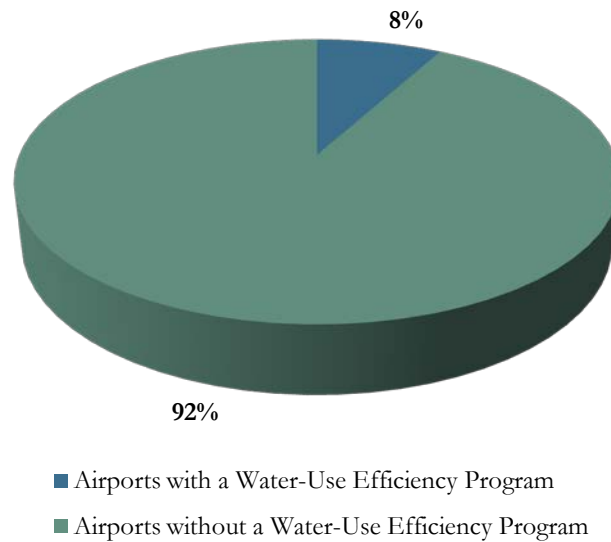
Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Performance Measure 2.10: Airports with a program to address water use efficiency

Water resources are not infinite. Study airports can be more environmentally compatible and help contribute to sustainability if they have a program in place to increase their efficient use of water. Controlling an airport’s use of water contributes to the preservation of water resources and is part of a new wave of sustainability efforts. Resource sustainability initiatives are relatively recent in the aviation community, and while larger commercial airports have started to address sustainability, most general aviation airports have not. Table A-11 and Figure A-11 in Appendix A summarize current system performance as it relates to those airports that have specific programs to increase water-use efficiency.

Airports are typically not large consumers of water. However, to consider all aspects of environmental sustainability, it is important to know which airports have programs to increase efficiency when it comes to their use of water resources. As Figure 5-13 reflects, only one of the study airports, Lee’s Summit Municipal, has a water efficiency plan in place. This translates to only 8 percent of all study airports. At this point, environmental sustainability initiatives for general aviation airports are not mandated by the FAA. Most airport-related environmental sustainability efforts are either voluntary or locally mandated. Chapter 6 discusses options for increasing system performance as it relates to this measure.

Figure 5-13 - Airports with a Water-Use Efficiency Program



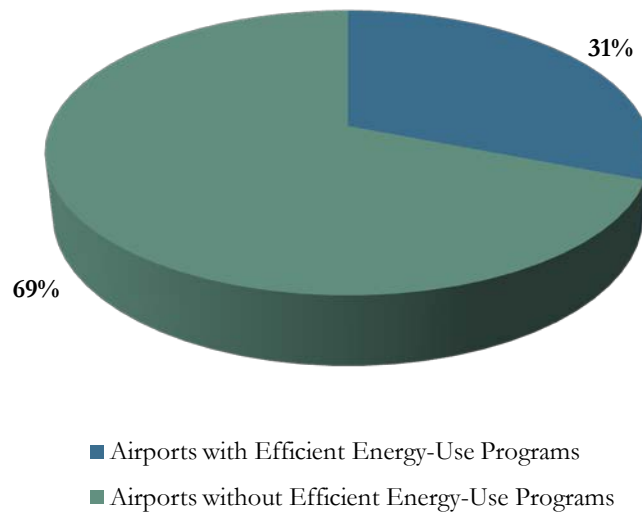
Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Performance Measure 2.11: Airports with a program to encourage efficient energy use

Similar to actions to improve water-use efficiency, some airports have programs in place to help conserve their use of energy. While energy conservation at general aviation airports is most often centered on buildings, it can also be expanded to include lighting. Table A-12 in Appendix A shows that two of the study airports report that they have taken steps to improve environmental sustainability by reducing the amount of energy that is required to run the airport. Again, FAA currently has no guidelines in place to direct energy related sustainability at general aviation airports. Therefore, airports that do have energy efficiency programs in place are either doing so on a voluntary basis or are following directives of their owner/sponsor.

As implied in the results shown in Figure A-12 in Appendix A, two airports in the Regional category and two airports in the Business category report they have programs in place to increase their efficient use of energy. As Figure 5-14 summarizes, on a system-wide basis, only 31 percent of all system airports currently have a program to promote efficient energy use. Chapter 6 discusses whether system performance for this measure should be improved.

Figure 5-14 - Airports with Efficient Energy-Use Programs for Buildings



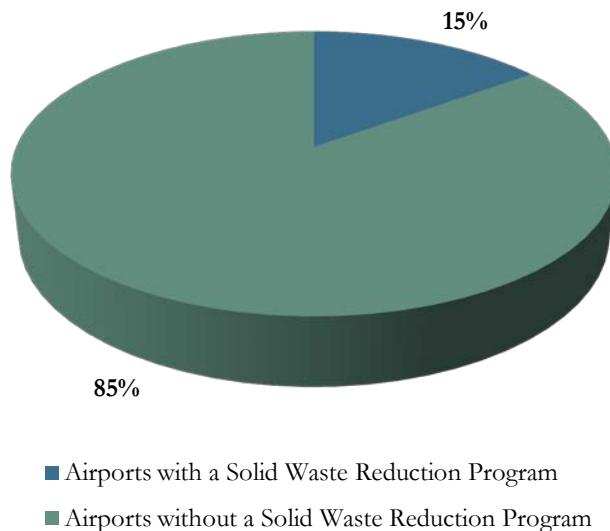
Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Performance Measure 2.12: Airports with a program to address solid waste reduction

Each study airport is in essence a business. Hence, as with other businesses, there is a certain amount of solid waste generated in association with the airport’s day-to-day operation. As with other sustainability initiatives, there are presently no FAA guidelines for reducing waste as part of an airport’s routine operations. If study airports have programs for solid waste reduction, they are most likely either voluntary or locally mandated. Table A-13 in Appendix A shows study airports that report they have steps in place to reduce solid waste generation. As shown in this table, only two study airports report such programs.

Figure A-13 in Appendix A summarizes current system performance for the waste reduction measure. Chapter 6 of the system plan discusses the viability of increasing system-wide performance for this sustainability factor from its current level of 15 percent to a higher level. Current system performance for this measure is summarized in Figure 5-15.

Figure 5-15 - Airports with a Solid Waste Reduction Program



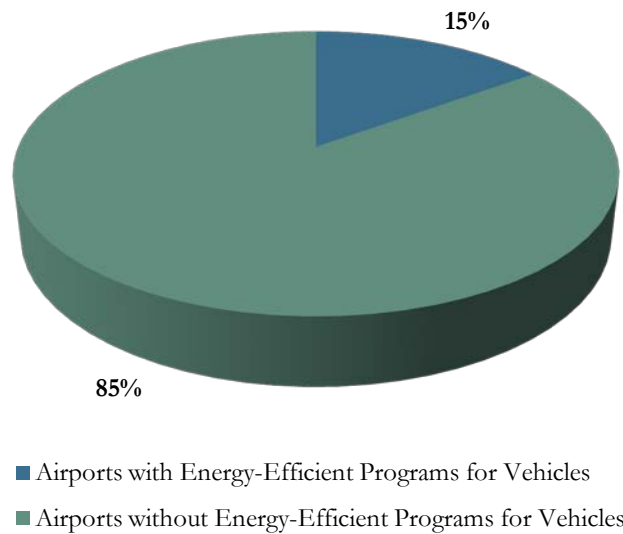
Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Performance Measure 2.13: Airports with strategies to promote energy efficient practices/programs for vehicles

Some of the nation’s larger commercial airports are aggressively pursuing programs to switch airport vehicles from gasoline to natural gas. These efforts are underway to enable the airports to be more environmentally responsible. General aviation airports, in comparison to large commercial airports, have a very small number of vehicles to support airport operations. Nevertheless, by replacing airport vehicles with more fuel-efficient versions, study airports can help to promote environmental sustainability. Most airports that have undertaken sustainability efforts in this category have switched to vehicles powered by natural gas, electric, or some type of hybrid power. Table A-14 in Appendix A provides information from study airports on those that have switched to more fuel-efficient vehicles.

Figure A-14 in Appendix A summarizes current system performance for this measure. As with other environmental sustainability performance measures, there currently are no mandates or guidelines for general aviation airports to switch from gasoline-powered vehicles to vehicles powered by alternative fuels. There is, of course, an implicit benefit from making such a switch, but there also is an associated cost. Chapter 6 provides information on increasing system performance for this measure. As Figure 5-16 shows, currently, only 15 percent of all study airports report they have programs to promote energy efficiency in the vehicles they use.

Figure 5-16 - Airports with Energy-Efficient Programs for Vehicles



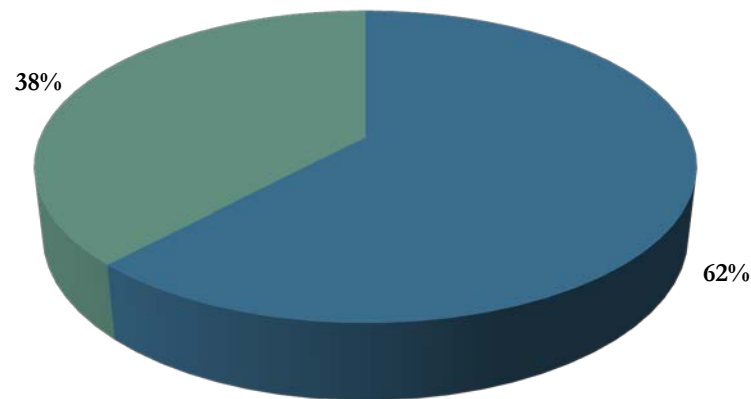
Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Performance Measure 2.14: Airports with recycling programs

Unlike other sustainability performance measures, efforts to recycle have been in place for some time. As Table A-15 in Appendix A shows, most study airports report that they have a recycling program in place. For study airports, recycling programs should involve not only airport management, but also airport tenants and visitors. For recycling programs to be effective, policies should be posted and convenient and clearly marked containers should be available at various locations around each airport. Establishing and following a recycling program is one sustainability approach that can be implemented to protect the environment at nominal cost. Many local governments have established recycling programs, so it is likely that for the publicly-owned airports included in Table A-15 these airports have established a program to be compliant with local polices.

Figure A-15 in Appendix A summarizes system performance for the recycling measure. A high percentage of airports in the Regional category report having an established recycling program, as do most of the Business Airports. System-wide, as shown in Figure 5-17, 62 percent of all study airports report they now have a recycling program. Educational efforts through MARC may be useful to increase future system performance for this measure.

Figure 5-17 - Airports with a Posted Recycling Program



■ Airports with a Posted Recycling Program ■ Airports without a Posted Recycling Program

Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Framework Goal #3: Social Performance: Promote a System that Fosters Social Responsibility

Along with financial and environmental responsibility and sustainability, study airports should also be socially responsible. Airports can increase their social sustainability when they actively serve and are involved with the communities that surround them. Performance measures for this framework goal help to set a context for how study airports are engaged in community sustainability efforts.

Airports encouraging transportation connectivity

As the regional transportation planning agency, one of MARC's objectives is to promote connectivity between various modes of transportation. Almost uniformly, general aviation airports across the U.S. lack connectivity to other modes of transportation, other than a roadway. For airports to support local residents and businesses and particularly to support visitors that use them, airports should have alternative means for reaching destinations in the communities they serve.

Performance Measure 3.1: Airports with ground transportation services for their customers

As part of this study's inventory effort, all airports provided information on options that are available for reaching various locations in communities served by the airport. This information is summarized in Table 5-5 (also in Table A-16 in Appendix A). Study airports provided several types of information as it relates to this performance measure. First, each airport indicated whether or not its customers have access to ground transportation services that are located at the airport. If they do, each airport also provided information on the type or types of services available. If ground transportation services are not available on-site, the study inventory also collected information to indicate whether the airport has the ability to arrange for ground transportation with sufficient notice.

Figures A-16 and A-17 in Appendix A summarize the information presented in Table 5-5. Most study airports report that their customers do have access to on-site ground transportation services, and at most

airports customers have a variety of ground transportation choices. Approximately 70 percent of all study airports report that their customers have on-site ground transportation service options. System-wide performance for this measure is summarized in Figure 5-18.

When airports with on-site transportation service options are combined with airports that report they can arrange for ground transportation, only three of the study airports are without ground access connections for their customers. Two of these airports are in the Community Airport role and one is in the Business Airport role. Typically, ground access will be provided at an airport if there is sufficient demand. None of the privately owned airports report they have on-site ground transportation services, and only one of the three privately-owned airports report that they can arrange for ground transportation services, but traffic from visiting aircraft is more limited at these airports.

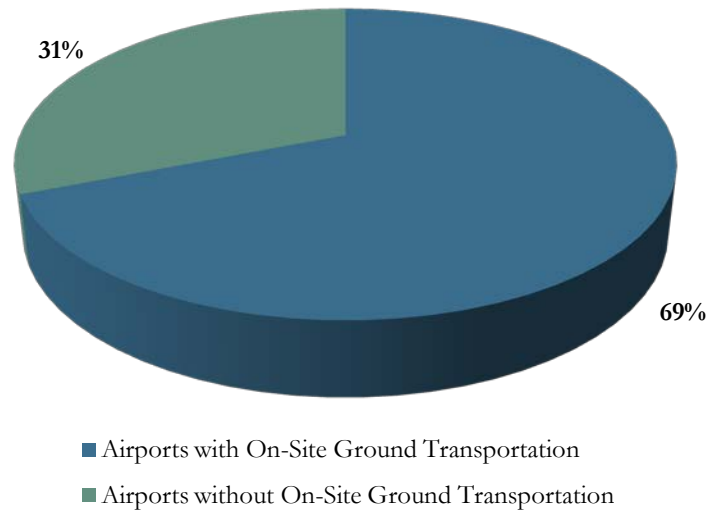
Figure 5-19 summarizes overall system performance for on- and off-airport ground transportation services.

Table 5-5 – Airports with Ground Transportation Services

Airport	On-Site Ground Transportation Services	Type(s) of Ground Transportation Services Available	Can Airport Arrange for Ground Transportation
Regional Airports			
Charles B. Wheeler Downtown	Yes	Limo, Taxi, Rental Cars, Airport Shuttle Service	Yes
East Kansas City	No	None	Yes
Lawrence Smith Memorial	Yes	Rental Cars, Taxi, Courtesy Car	Yes
Lee's Summit Municipal	Yes	Rental Car, Taxi, Limo	Yes
Midwest National Air Center	Yes	Courtesy Car	Yes
New Century Air Center	Yes	Taxi, Limo, Johnson County Transit	Yes
Business Airports			
Excelsior Springs Memorial	No	None	No
Johnson County Executive	Yes	Taxi, Limo, Johnson County Transit	Yes
Sherman Army Airfield	Yes	Courtesy Car, Rental Car	Yes
Community Airports			
Gardner Municipal	Yes	Taxi	Yes
Miami County	Yes	Courtesy Car	Yes
Noah's Ark	No	None	No
Roosterville	No	None	No

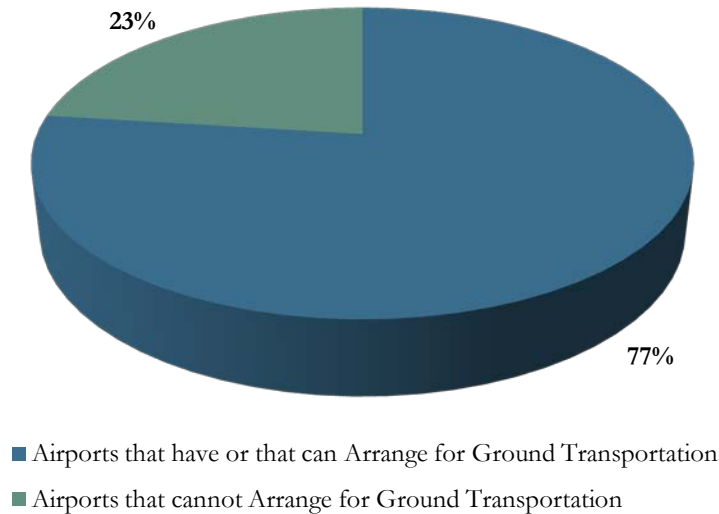
Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits

Figure 5-18 - Airports with On-Site Ground Transportation Services



Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Figure 5-19 - Airports that have or that can Arrange for Ground Transportation



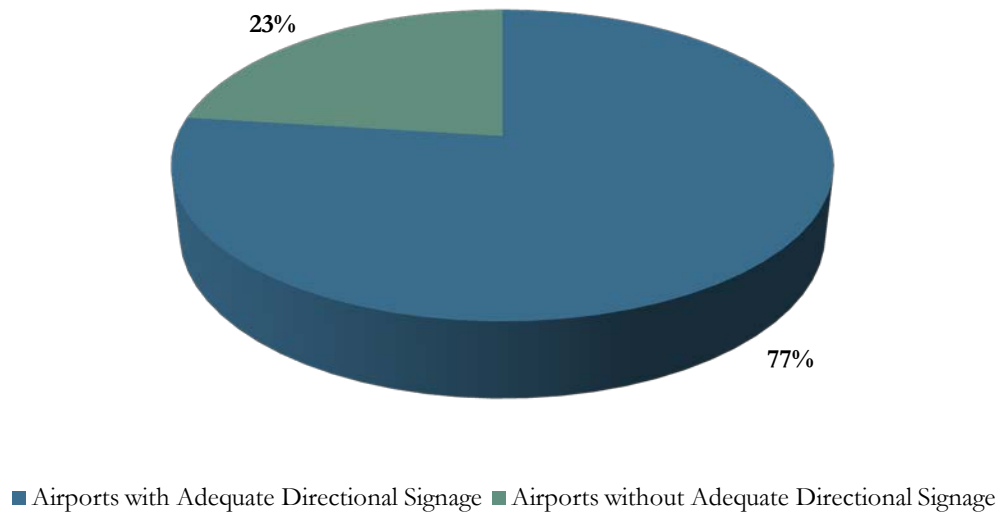
Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Performance Measure 3.2: Airports with adequate directional signage

Directional signage to airports is most often provided by state governments. Local governments can also provide signage, depending on regulations. In some instances, privately-owned airports may provide their own signage. For this study, airports self-reported as to whether or not they believe the directional signage to their airport is currently adequate. Table A-17 in Appendix A summarizes this reporting.

Figure A-18 in Appendix A summarizes, by airport role, current system performance for directional signage. Most study airports report that their directional signage is currently adequate. As Figure 5-20 shows, 77 percent of study airports report having adequate airport signage. Chapter 6 identifies actions that may be appropriate for improving system performance for this measure.

Figure 5-20 - Airports with Adequate Directional Signage



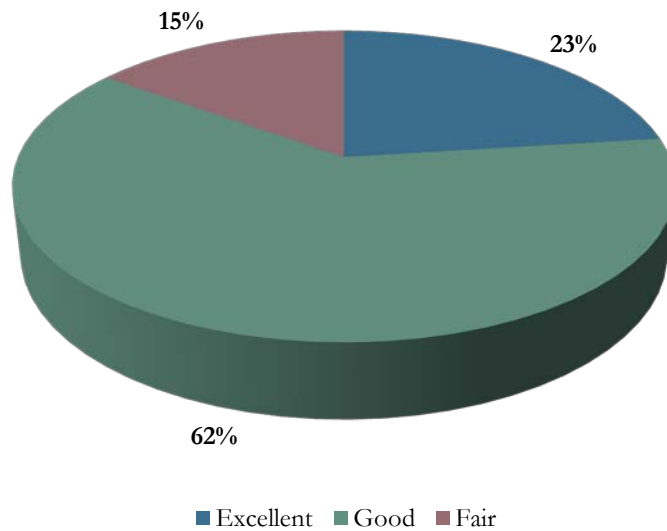
Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Performance Measure 3.3: Airports with entrance roads in adequate condition

During the system plan inventory, information was also collected on the ownership and the condition of the primary entrance road for each airport. Airports were asked to rank the condition of their entrance roads as excellent, good or fair. Table A-18 in Appendix A summarizes the results. Most airports rate the condition of their entrance road as excellent or good. Only two of the study airports rated the condition of their entrance road as fair. Information in Table A-18 also shows that most study airports own their own entrance roads.

Figure A-19 in Appendix A summarizes, graphically, the information in Table A-18. As Figure 5-21 depicts, the system-wide ratings for existing conditions on airport entrance roads are as follows: 23 percent excellent, 62 percent good, and 15 percent fair. For the two airports rating the condition of their primary access road as fair, one is publicly-owned and one is privately-owned. Data in Table A-18 also indicates that 62 percent of all study airports are responsible for maintaining their own primary access roads. For the two airports that rate the condition of their access road as fair, both airports indicate that they own and are responsible for that access road. Chapter 6 evaluates system adequacy based on these findings.

Figure 5-21 - Airports Entrance Roads Condition



Source:

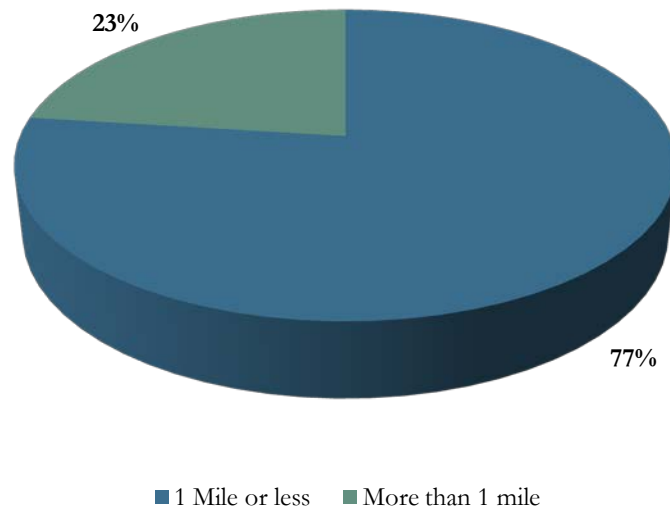
Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Performance Measure 3.4: Airport distance from state and/or federal roadway

Convenient access is one factor that makes an airport a good community partner. As part of the inventory effort, each airport’s approximate distance from either a federal or a state highway was estimated. Table A-19 in Appendix A shows that all but three of the study airports are within 1 mile or less of a federal or state highway.

As Figure A-20 in Appendix A illustrates, all Regional Airports (100 percent) are within 1 mile or less of a federal or state highway. Only one Business Airport, Sherman Army Airfield, is more than 1 mile from a federal or state highway, while two of the Community Airports — Roosterville and Miami County — are more than 1 mile from a highway. As Figure 5-22 shows, system-wide, 77 percent of all study airports are within 1 mile or less of a federal or state highway. Since airport locations will not change, the ability to enhance the performance of the existing system as it relates to this measure is limited.

Figure 5-22 - Airports with Adequate Distance from State/Federal Roadway



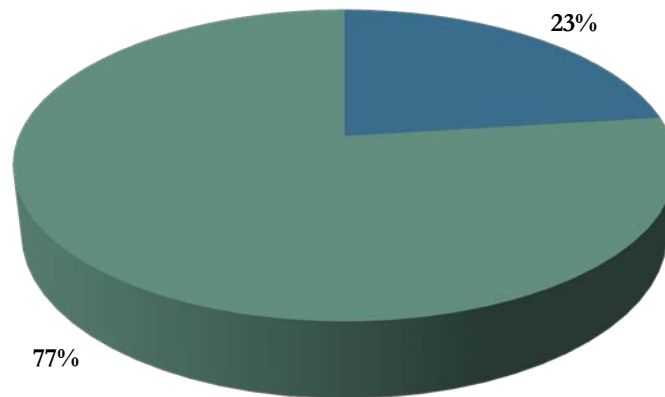
Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Performance Measure 3.5: Airports served by any form of public transportation

The availability of public transit to an airport helps ensure equitable access to disadvantaged populations. Table A-20 in Appendix A shows that three of the study airports —Charles B. Wheeler Downtown, New Century Air Center, and Johnson County Executive — have daily transit service.

Figure A-21 in Appendix A summarizes the information presented in Table A-20. Currently, on a system-wide basis, as shown in Figure 5-23, only 23 percent of all study airports have ground access via public transit. In Chapter 6, information is provided on which study airports may be candidates for added public transit routes in the future. Additional ground access would increase system performance for this measure.

Figure 5-23 - Airports Served by Public Transportation



■ Airports Served by Public Transportation
 ■ Airports Not Served by Public Transportation

Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Airports with economic benefit analyses and community outreach programs

Performance Measure 3.6: Airports that have estimated their annual economic impact

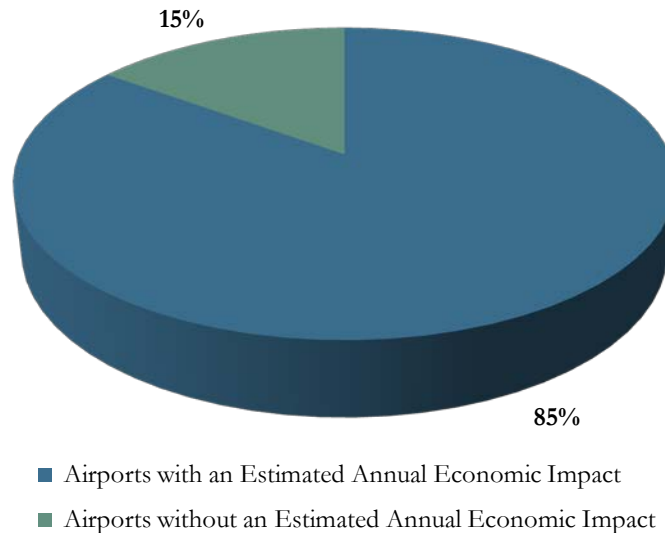
An economic impact study provides information on jobs that are supported by an airport, the annual payroll associated with these jobs, and annual economic activity or output generated by an airport through its day-to-day operations. Most economic impact studies estimate impacts associated with airport management, airport tenants, capital investment, and spending from visitors who arrive in the study area via the airport. Both KDOT and MoDOT have undertaken statewide economic impact studies that provide estimates of annual economic impact for some study airports.

Information from an economic impact study can be a powerful tool. As noted earlier in this chapter, study airports that have public owners all benefit from some type of local financial support, either through a local General Fund or an Enterprise Fund. It is sometimes important for airports to demonstrate that local investment is exceeded by a higher annual economic return. Economic impact studies provide the data needed to make this case. Also, when general aviation airports seek to expand, there can sometimes be local opposition. This opposition often results when the community does not understand the full scope of the positive economic benefit that the airport has on the community or the communities that it serves. Once again, economic impact studies provide this type of educational information.

Table A-21 and Figure A-22 in Appendix A summarize information about study airports that have estimates of their annual economic impact. Table A-21 also indicates the year in which the study was prepared; most estimates of economic impact for study airports were published in 2010 or 2012 by MoDOT or KDOT, respectively. Only the two privately owned Community Airports, Roosterville and Noah’s Ark, report not having an estimate of their economic impacts. System-wide performance for this measure is summarized in Figure 5-24. The outlook for updating or expanding economic impact reporting for study airports is discussed in Chapter 6; it is worth noting that during 2016 KDOT expects to complete

an update to its statewide economic impact study for Kansas airports that are included in the regional system plan.

Figure 5-24 - Airports with an Estimated Annual Economic Impact



Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

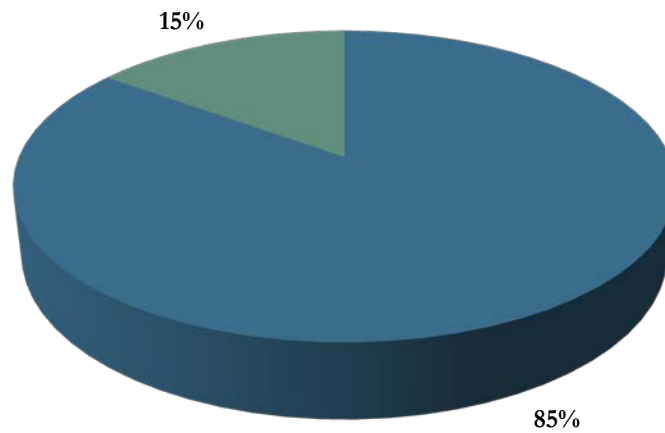
Airports establishing ongoing community outreach programs through websites, meetings or social media

Performance Measure 3.7: Airports using websites, newsletters and social media

For study airports to be socially sustainable, they should have open lines of communication with the community or communities they serve. Some airports publish newsletters to communicate with both the aviation and non-aviation public. More airports are now taking advantage of electronic communications tools and have their own websites. Both newsletters and websites allow the airport to reach out on a regular basis to inform the community about airport users, activities, events and development projects. Some airports have started to communicate through social media using tools such as Facebook and Twitter.

Table A-22 in Appendix A shows which airports are communicating via social media and which have websites or newsletters to distribute information about the airport on a regular basis. Figures A-23 and A-24 summarize this same information graphically. As Figure A-23 illustrates, only two of the privately-owned study airports in the Community category, Noah’s Ark and Roosterville, report that they do not have either a newsletter or a website. As Figure 5-25 shows, system-wide, 85 percent of all study airports are communicating with their surrounding communities via either a website or a newsletter. As Figure 5-26 shows, a lower percentage of airports system-wide (54 percent) indicate that they use social media to communicate with the aviation and the non-aviation public.

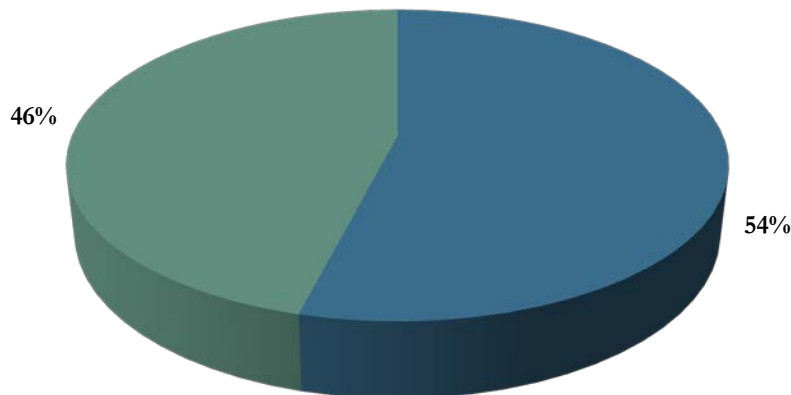
Figure 5-25 - Airports with a Website or Newsletter



■ Airports with a Website or Newsletter ■ Airports without a Website or Newsletter

Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Figure 5-26 - Airports that use Social Media



■ Airports that use Social Media ■ Airports that do not use Social Media

Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Aside from written and electronic communication, there are other activities that contribute to social responsibility through outreach to the community at large. The following performance measures were used to provide additional context on how study airports are contributing to their social responsibility:

- *Performance Measure 3.8: Airports with a board, advisory committee and/or an authority*
- *Performance Measure 3.9: Airports with a manager who attends meetings with neighboring cities/counties*
- *Performance Measure 3.10: Airports that hold public open houses on a regular basis*

Table 5-6 summarizes information collected during the regional system plan inventory for each of these performance measures. Some study airports have airport boards or advisory committees. In some instances, these groups actually take a direct role in making decisions on the airport's operations; in others, they may be purely advisory and act as a sounding board for airport management. Typically, airport boards or committees are comprised of a cross section of the community; these groups are often appointed but sometimes they can be elected. When an airport board or advisory committee represents a cross section of the community the airport serves, committee members can communicate with others in their sphere of influence about the airport's benefits and needs. Having multiple champions helps the airport enhance its social sustainability.

As previously noted in this chapter, many study airports are owned and operated by cities or counties. In these instances, the airport manager is often an employee of that entity. Regardless of whether the airport is publicly-owned, owned by another entity like Sherman Army Airfield is, or is privately-owned, social sustainability is increased when the airport manager or operator is actively engaged with local government. As part of the inventory, information presented in Table 5-6 was collected to determine which study airports have representation at city/county meetings.

Finally, social sustainability can be augmented when airports invite the general non-flying public to events at the airport. These events provide the general public with an opportunity to see and understand the airport on a one-on-one basis. Events such as breakfasts, tours for local elected officials and business leaders, and family movie nights can attract non-fliers to the airport, thereby increasing social sustainability.

Figures A-25, A-26, and A-27 in Appendix A provide graphic summaries of the information presented in Table 5-6. As Figure A-25 shows, only two of the privately-owned study airports, Roosterville and Noah's Ark, report that they do not have any type of advisory committee or board. The same two airports report that they do not participate in meetings of county or city officials that are open to the public. Four of the airports report that they do not hold events geared to attracting and educating the non-flying public on the airport.

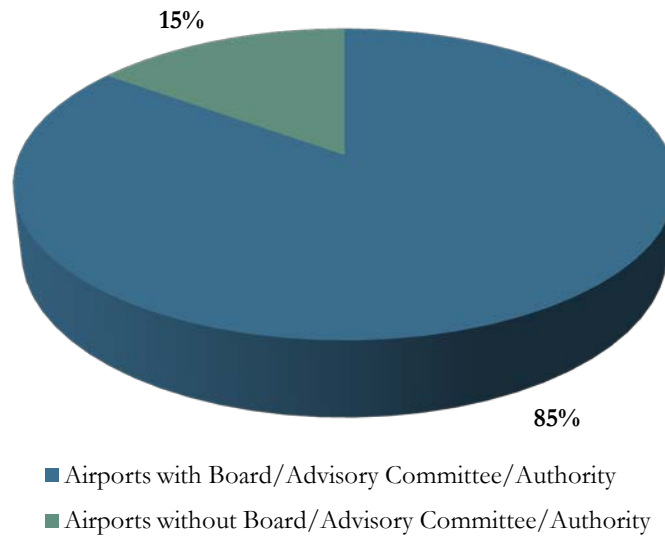
While most study airports seem to be taking advantage of opportunities to enhance their social sustainability, there are still opportunities to increase the system's performance for the measures considered here. Figure 5-27, Figure 5-28, and Figure 5-29 summarize system-wide performance for this measure.

Table 5-6 - Airports with Community Outreach Programs

Airport	Board/Advisory Committee/Authority	Manager Attends City/County Meetings	Regular Public Open House
Regional Airports			
Charles B. Wheeler Downtown	Yes	Yes	Yes
East Kansas City	Yes	Yes	Yes
Lawrence Smith Memorial	Yes	Yes	Yes
Lee's Summit Municipal	Yes	Yes	Yes
Midwest National Air Center	Yes	Yes	No
New Century Air Center	Yes	Yes	Yes
Business Airports			
Excelsior Springs Memorial	Yes	Yes	Yes
Johnson County Executive	Yes	Yes	Yes
Sherman Army Airfield	Yes	Yes	No
Community Airports			
Gardner Municipal	Yes	Yes	Yes
Miami County	Yes	Yes	No
Noah's Ark	No	No	No
Roosterville	No	No	Yes

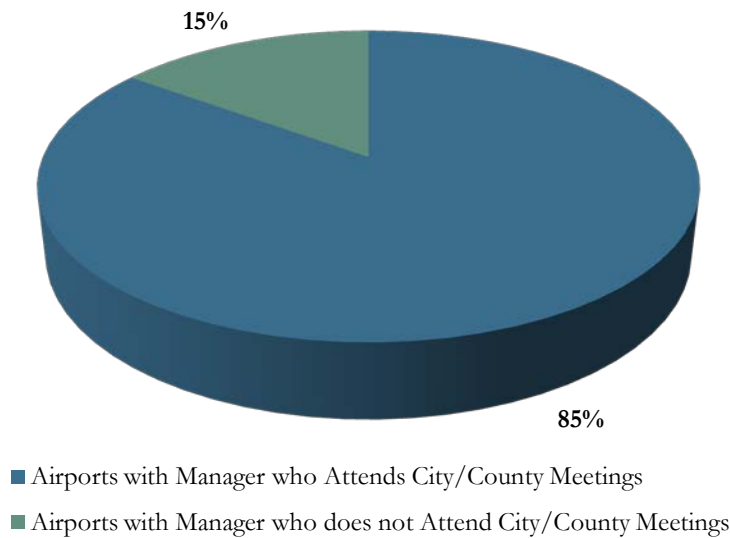
Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Figure 5-27 - Airports with Board/Advisory Committee/Authority



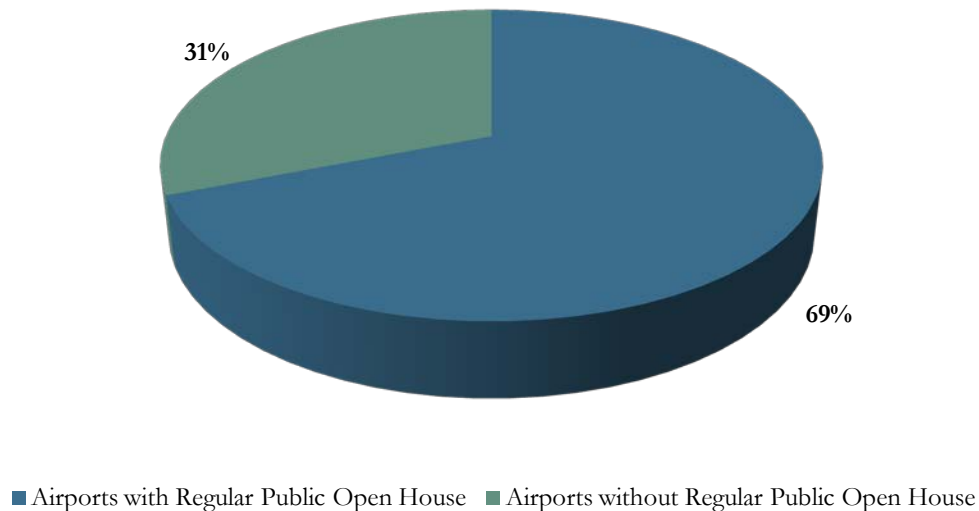
Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Figure 5-28 - Airports with Manager who Attends City/County Meetings



Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Figure 5-29 - Airports with Regular Public Open House



Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

This chapter of the system plan has employed a series of framework goals and performance measures to gauge the adequacy of the existing system of general aviation airports that serves the Greater Kansas City area. In Chapter 6, the RASP provides guidance on actions that should be considered to elevate the system’s future performance.

Chapter Six: Future Airport Roles

The previous chapter used a series of measures, identified specifically for this study, to evaluate the current performance of general aviation airports serving the nine-county study area. The evaluation process considered current performance both for the system as a whole and for airports in each role classification. As discussed previously in Chapter 4, airport roles used thus far were adopted primarily from roles previously established for study airports in either the Kansas or the Missouri State Aviation System Plan.

As part of the process to identify a future airport system that will serve the Kansas City Metropolitan Area in both a viable and balanced way, it is important to determine if adjustments to current roles for study airports are appropriate. In order to promote the viability of airports within any given airport system, it is ideal to have airports with roles that are matched to the characteristics of the areas they serve in order to help to prevent airports from being underdeveloped or overdeveloped. When airport characteristics are aligned with those of the communities they serve, there is a better opportunity for ensuring the airport's longer term financial viability.

General aviation demand is often closely related to factors such as population and employment. While there is not always a direct correlation, generally speaking, airports serving higher concentrations of population and employment often have higher levels of demand for aviation services. Airports serving more highly developed areas should most often have facilities and services that, comparatively, are more developed. When investment is made in airports that serve higher concentrations of population and employment, there is a greater likelihood that there will be a positive economic return on investment at these airports. Examining the relationship of study airports to population and employment in the study area also helps to determine if the system is balanced in terms of its geographic distribution for various types of airports.

This chapter uses the following information to determine the need to adjust airport roles discussed in Chapter 4 of the regional system plan:

- Relationship of airport service areas to current concentrations of population and employment.
- Relationship of airport service areas to current airport roles.
- Relationship of airport service areas to anticipated areas of population and employment growth.

Airport Service Areas with the Highest Concentrations of Population and Employment

Using a Geographic Information System (GIS) and data collected by MARC, for the nine-county study area, an analysis was completed to estimate total population and employment in proximity to each of the study airports. A 10-mile radius around each airport was established, as a proxy, to support the mapping and evaluation. In reality, the size of each airport's individual market or service area varies. Actual service/market areas are included by factors such as ground accessibility, facilities and services provided, and the location of competing airports. To support this analysis, however, consistent 10-mile service areas were used.

Following the GIS mapping, the study airports were ranked from high to low in terms of current population within their 10-mile service area; Table 6-1 shows the results of the GIS population density analysis. Table 6-2 provides similar information for current employment within airport service areas. Both tables also show each study airport's current role as assigned (in Chapter 4 of this system plan) and ownership status of the airport within the regional airport system.

Table 6-1 – Current Population in 10-Mile Airport Service Areas

	Airport	Role	Ownership	Total Population within Service Area (2011)
High	Charles B. Wheeler Downtown	Regional	Public	627,933
	Johnson County Executive	Business	Public	401,509
	Lee's Summit Municipal	Regional	Public	385,961
	New Century Air Center	Regional	Public	183,517
	Roosterville	Community	Private	183,041
Medium	Noah's Ark	Community	Private	175,372
	East Kansas City	Regional	Private	171,103
	Kansas City International	Commercial	Public	129,317
	Gardner Municipal	Community	Public	101,935
Low	Midwest National Air Center	Regional	Public	76,644
	Sherman Army Airfield	Business	Military	64,147
	Excelsior Springs Memorial	Business	Public	37,240
	Lawrence Smith Memorial	Regional	Public	25,259
	Miami County	Community	Public	18,449

Source: Vireo.

Table 6-2 – Current Employment in 10-Mile Airport Service Areas

	Airport	Role	Ownership	Total Employment within Service Area (2011)
High	Charles B. Wheeler Downtown	Regional	Public	364,461
	Johnson County Executive	Business	Public	264,492
	Lee's Summit Municipal	Regional	Public	140,885
	New Century Air Center	Regional	Public	83,755
	Noah's Ark	Community	Private	63,379
	Roosterville	Community	Private	56,806
Medium	East Kansas City	Regional	Private	49,996
	Kansas City International	Commercial	Public	46,995
	Gardner Municipal	Community	Public	37,666
	Midwest National Air Center	Regional	Public	25,499
Low	Sherman Army Airfield	Business	Military	18,819
	Excelsior Springs Memorial	Business	Public	9,360
	Lawrence Smith Memorial	Regional	Public	8,197
	Miami County	Community	Public	5,849

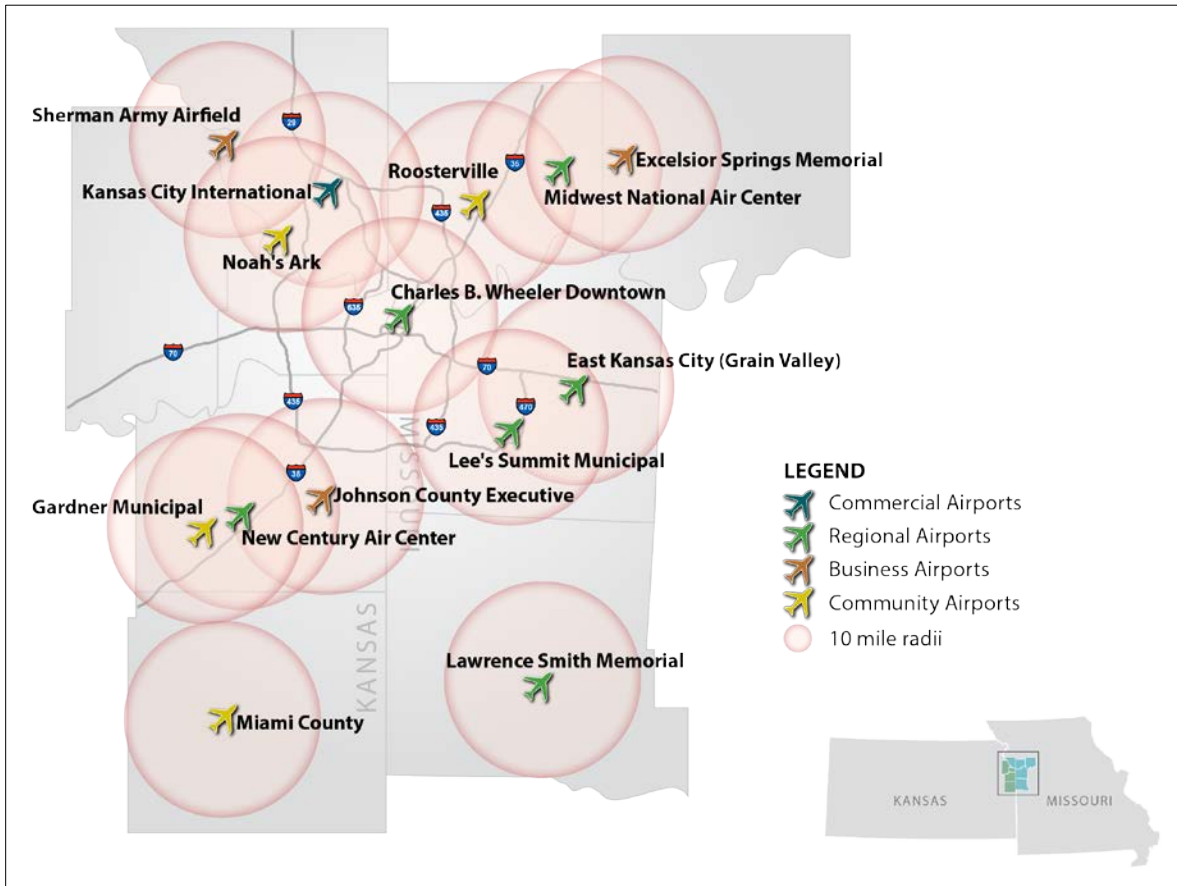
Source: Vireo.

It is worth noting, that airports in the Regional and Business roles do not necessarily serve the highest concentrations of population and employment. Nor do airports in the Community role consistently serve the lower concentrations of population and employment.

Relationship of Airport Service Areas

Figure 6-1 shows the 10-mile service areas for each airport used in this analysis. As this figure shows, several radii of the airports have service areas that overlap. According to the FAA, one of the primary objectives of aviation system planning is to promote a system of airports that is balanced. This includes the geographic distribution of airports playing different roles within the system. In the study area, when airport service areas overlap, the overlapping areas should ideally be served by airports playing different system roles.

Figure 6-1 – 10-Mile Airport Service Areas for Current Airport Roles



Source: Jviation, Inc.

Northern Portion of Study Area

Starting in the northern portion of the study area (see Figure 6-1), Midwest National Air Center (Regional), Roosterville (Community), and Excelsior Springs (Business) have service areas that overlap. Each of these airports having a different role assignment helps to support the concept of a balanced system.

As shown in Table 6-1, the 10-mile service area for Roosterville has some of the highest concentrations of population. While the ranking for employment in the Roosterville service area is not as high as for population, employment in the Roosterville service area still ranks in the upper half of all service areas for employment served. Roosterville is a privately-owned airport and is not supported by any public (local, state or federal) funding.

Also in the northern portion of the study area, Noah's Ark (Community), Kansas City International (Commercial) and Sherman Army Airfield (Business) have 10-mile service areas that overlap. As shown in Tables 6-1 and 6-2, among these three study airports, the highest concentrations of current population and employment are in the 10-mile service area for the Noah's Ark, a privately-owned airport. Sherman Army Airfield is owned by the U.S. Department of Defense (DOD). While Kansas City International does serve transient or visiting general aviation aircraft operations, as the region's only commercial airport, this airport serves a limited number of local/based general aviation aircraft. The long-term development plan for Kansas City International includes limited facilities to serve based general aviation planes, with facilities geared to serving only large general aviation aircraft. According to GIS analysis, both Kansas City International and Sherman Army Airfield currently have lower concentrations of current population and employment than does the Noah's Ark service area.

Central Portion of the Study Area

Moving to the central part of the study area, Charles B. Wheeler Downtown (Regional) is the primary airport serving this area. As shown in Tables 6-1 and 6-2, Charles B. Wheeler Downtown has the highest current concentrations of both population and employment, among all study airports. As shown in Figure 6-1, to the north, Charles B. Wheeler Downtown has overlapping service areas with both Noah's Ark and Roosterville, both privately-owned airports assigned to the Community airport role in the regional system.

Southeast Portion of the Study Area

As Figure 6-1 shows, Charles B. Wheeler Downtown has a small service area overlap with the Lee's Summit Airport, another Regional airport. As shown in Tables 6-1 and 6-2, Lee's Summit Airport also serves a high portion of the study area's population and employment.

The 10-mile service area for the Lee's Summit Airport also overlaps with the service area for the East Kansas City Airport, as shown in Figure 6-1. East Kansas City is another privately-owned airport; currently, this airport is classified in the Regional Airport role. The service area for the East Kansas City Airport ranks in the top half among all study airports for the population and employment that it covers. The East Kansas City Airport accommodates a high number of based aircraft. Similar to other privately-owned airports included in the regional system plan, this airport's source of funds for operation and development are limited to private-owner investment.

Lawrence Smith Memorial (Regional) also serves the southeastern portion of the study area and has no service area overlaps. The current concentrations of both population and employment in this airport's service area are among the lowest for all study airports.

Southwestern Portion of the Study Area

Airports that serve the southwestern part of the study area include New Century Air Center (Regional), Johnson County Executive (Business), Miami County (Community), and Gardner Municipal (Community). Differing roles for these study airports help reduce duplication of services they provide, despite any overlap in service areas.

As shown in Tables 6-1 and 6-2, the 10-mile service areas for the Johnson County Executive Airport and New Century Air Center have some of the highest concentrations of both population and employment. Miami County (Community), as determined by GIS analysis for all airport service areas, has some of the lowest concentrations of employment and population among all study airports. Gardner Municipal Airport falls in the mid-range, among all airports, for the population and employment that it currently serves.

Observations on Airport Service Areas

Based on information in Tables 6-1 and 6-2 and Figure 6-1, the following observations can be drawn as they relate to the system's current performance relative to providing access to population and employment in the nine-county area:

- Two of the study airports that accommodate significant portions of the region's current population and employment, Roosterville and Noah's Ark, are privately-owned. The private-ownership of these airports limits their source of financial support for both operations and development needs.
- The 10-mile service area for Charles B. Wheeler Downtown has the highest concentrations of both population and employment. The service area for this airport overlaps with both Roosterville and Noah Ark, two privately-owned airports that play a notable role in serving both population and employment in the study area, according to GIS analysis. Charles B. Wheeler Downtown is designated as a Regional Airport and has access to local, state, and FAA funding. While Charles B. Wheeler Downtown has sufficient airfield capacity, it has limited capabilities for additional landside expansion, including the development of additional hangars. When the airport's VOR is decommissioned, this will open up some space for additional, but not unlimited, hangar development.
- The service area for the Lee's Summit Airport overlaps with both Charles B. Wheeler Downtown and East Kansas City. As noted, further landside expansion at the Charles B. Wheeler Downtown Airport is limited, even with space that will become available when the on-airport VOR is decommissioned. Lee's Summit could experience spill over demand for hangar facilities that cannot be accommodated at the Charles B. Wheeler Downtown Airport. As a privately-owned airport, the future financial viability of the East Kansas City Airport is influenced by the fact that the airport receives no public financial support. With over 200 based aircraft, the longer term financial sustainability of the East Kansas City Airport could have a potential impact on the Lee's Summit Airport.
- Despite the overlapping service areas in the southwestern part of the study area, most airports in this part of the study area play different roles in the regional system. In addition, concentrations of population and employment in the service areas for Johnson County Executive, New Century Center, and Gardner Municipal are high, indicating the potential for above-average demand for aviation services in this part of the study area. The fact that all airports in the southwestern part of the study area are publicly-owned increases the financial viability of these system airports over the longer term.

The foregoing discussion highlights the distribution of study airports by role, as this distribution relates to current population and employment in the study area. Understanding the relationship of study airports to one another and to socio-economic and demographic characteristics is important to determining if the study area is adequately served by a balanced and viable airport system.

The review also helps to assess the likelihood for aviation demand in various parts of the study area. The greater the likelihood for aviation demand, the higher the potential for financial sustainability for any study airport. The findings of this section will be combined with those of the next sections that examine anticipated population and employment growth in airport service areas to determine the need for changes in future airport roles.

Airport Service Areas with Highest Rates of Projected Population Growth

Available data from MARC was used to estimate anticipated rates of population increase within service areas for all study airports. For each of the 10-mile service areas around study airports, estimates of population growth were developed using GIS analysis. Figures depicting this analysis are included in Appendix B to this report (Figures B-1 to B-14).

Figures B-1 to B-14 present cumulative forecasted population increases by census tract for 2010 to 2040. This data helps to provide a relative indication of which airport service areas are expected to experience the highest percentage increase in population.

Based on analysis of data contained in Figures B-1 to B-14 in Appendix B, Table 6-3 summarizes information on study airports that are forecasted to have the highest rates of population growth in their 10-mile service area.

Table 6-3 – Estimated Population Rate of Growth in 10-Mile Airport Service Areas

	Airport	Role	Ownership	Total Population within Service Area (2011)	Estimated % Increase 2010-2040
High	Gardner Municipal	Community	Public	101,935	86%
	New Century Air Center	Regional	Public	183,517	78%
	Kansas City International	Commercial	Public	129,317	61%
	Roosterville	Community	Private	183,041	51%
Medium	Johnson County Executive	Business	Public	401,509	47%
	Noah's Ark	Community	Private	175,372	44%
	Lawrence Smith Memorial	Regional	Public	25,259	41%
	Midwest National Air Center	Regional	Public	76,644	41%
	Excelsior Springs Memorial	Business	Public	37,240	34%
Low	Miami County	Community	Public	18,449	25%
	Sherman Army Airfield	Business	Military	64,147	22%
	East Kansas City	Regional	Private	171,103	19%
	Lee's Summit Municipal	Regional	Public	385,961	15%
	Charles B. Wheeler Downtown	Regional	Public	627,933	8%

Source: Vireo.

Using Table 6-3, the following conclusions can be drawn in terms of the regional airport system being adequately positioned and developed to meet the region's anticipated population growth:

- Collectively, the highest rate of population increase between 2010 and 2040 is anticipated in the southwest portion of the study area served by Gardner Municipal (86 percent increase), New Century Air Center (78 percent increase), and Johnson County Executive (47 percent increase). While the service areas of these three study airports overlap, each is assigned a different role in the regional system. Airports in this part of the study area appear to be positioned to meet growth in aviation demand that may be driven by increasing population.
- The northern portion of the study area has the next highest forecasted rate of population increase, and is served by Kansas City International, Roosterville, and Noah's Ark. These airports may not be as well positioned to serve general aviation demand that could be stimulated by population growth. Facilities at Kansas City International are not geared to address the needs of smaller, based general aviation aircraft, but this airport does have facilities and services to meet the needs of larger general aviation planes and visiting/transient general aviation aircraft. Both Roosterville and Noah's Ark now serve relatively high concentrations of the study area's population; however, both are privately-owned which could impact their longer-term financial viability.
- Kansas City International is not a viable alternative for absorbing local general aviation demand if either of these two privately-owned airports is not available in the future. The service area for Sherman Army Airfield has one of the lower forecasted rates of population growth. The expansion potential for this facility is also limited because the airport's public facilities are on property owned by the DOD.
- The central portion of the study area is served by Charles B. Wheeler Downtown, which is the closest airport to the Central Business District (CBD). This area is forecasted to have the lowest rate of increase in population; however, it currently has the highest concentration of population in the study area.
- The areas served by Excelsior Springs and Midwest National airports, are expected, as shown in Table 6-3, to experience a rate of increase in population from 2010–2040 that is the mid-range among the service areas for all study airports.
- Population growth rates in service areas for Miami County and Lawrence Smith Memorial are projected in the moderate range. Anticipated growth in aviation demand tied to increased population can most likely be accommodated by these two airports.

Airports with the Highest Rates of Projected Employment Growth

Similar to future population, Figures B-15 to B-28 in Appendix B analyze anticipated employment growth between 2010 and 2040 in the service area for each of the study airports. Table 6-4 summarizes information that shows estimated rates of employment increase for all airport service areas.

Table 6-4 – Estimated Rate of Employment Growth in 10-Mile Airport Service Areas

	Airport	Role	Ownership	Total Employment within Service Area (2011)	Estimated % Increase 2010-2040
High	Kansas City International	Commercial	Public	46,995	107%
	New Century Air Center	Regional	Public	83,755	86%
	Noah's Ark	Community	Private	63,379	86%
	Gardner Municipal	Community	Public	37,666	83%
	Roosterville	Community	Private	56,806	53%
	Johnson County Executive	Business	Public	264,492	46%
Medium	Lawrence Smith Memorial	Regional	Public	8,197	28%
	East Kansas City	Regional	Private	49,996	25%
	Lee's Summit Municipal	Regional	Public	140,885	25%
	Excelsior Springs Memorial	Business	Public	9,360	25%
Low	Sherman Army Airfield	Business	Military	18,819	20%
	Midwest National Air Center	Regional	Public	25,499	19%
	Miami County	Community	Public	5,849	19%
	Charles B. Wheeler Downtown	Regional	Public	364,461	11%

Source: Vireo.

The review of current aviation facilities is one factor used to determine adequacy of the region's aviation system in order to meet the higher projected rates of employment growth. Based on information summarized in Table 6-4, the following conclusions can be drawn:

- The service area for Kansas City International has the highest anticipated rate of employment increase between 2010 and 2040 which indicates that additional visiting general aviation aircraft may be attracted to this airport. However, businesses in this service area could need to base any additional general aviation aircraft, especially smaller planes that are not high performance aircraft, at other study airports since facilities at Kansas City International are not geared to serving smaller based general aviation aircraft.
- Near Kansas City International, the service areas for Roosterville (53 percent increase) and Noah's Ark (86 percent increase) are also expected to have notable rates of employment increase. These airports may not be well positioned to serve general aviation demand that could be stimulated by employment/business growth, as these two airports are privately-owned which could impact their longer-term financial viability. Both airports are also Community Airports with less developed facilities and services, and they may not meet a high percentage of business aviation needs. Kansas City International would most likely not be a viable alternative for absorbing based aircraft demand should either of these two privately-owned airports not be available in the future. The service area for Sherman Army Airfield has a lower anticipated rate (20 percent increase) of employment growth; however, the expansion potential for this facility is also limited because the airport's public facilities are on property owned by the DOD.
- Between 2010 and 2040, service areas for Gardner Municipal (83 percent increase), New Century Air Center (86 percent increase), and Johnson County Executive (46 percent increase) have some of the higher rates of anticipated employment increase. All three of these airports are assigned different

roles in the regional system. This part of the study area appears to be positioned to meet growth in general aviation demand that may be stimulated by employment growth.

- The central portion of the study area served by Charles B. Wheeler Downtown (11 percent increase) is projected to have a lower rate of employment increase. Current concentrations of employment in the airport service area are among the highest in the study area.
- As Table 6-4 shows, Excelsior Springs and Midwest National Airport are expected to experience a rate of increase in employment in the mid-range among all airport service areas. These airports play different roles and serve different segments of the general aviation market. These airports should be positioned to serve anticipated growth in aviation demand generated by increased employment.
- For Miami County and Lawrence Smith Memorial, the anticipated employment growth rates for their service areas, 19 percent and 28 percent respectively, are in the moderate range. These two airports can accommodate anticipated growth in demand tied to increased employment.

Future Airport Roles

Information in the preceding sections shows:

- The geographic relationship of study airports to one another by airport role.
- Which airport service areas now have the highest concentrations of population and employment.
- The service areas that are expected to have the highest rates of population and employment increase between 2010 and 2040.

Analysis completed for this portion of the regional system plan yields the following conclusions:

- Within the northern part of the study area, the service area for Roosterville, a privately-owned, Community Airport, has relatively high concentrations of current population and employment. In addition, this airport's service area is expected to have relatively high rates of future growth for both population and employment. Community Airports, generally speaking, have more limited facilities and services to meet the needs of their customers. In addition, as a privately-owned airport, Roosterville does not have access to any public funds (local, state or federal) for its development or operation, and it is not subject to any grant assurances to remain open to the public. Roosterville plays an important role in serving the study area's general aviation needs, and its role as a Community Airport should be maintained.
- Midwest National Air Center (Regional Airport) and Excelsior Springs Memorial (Business Airport) have some overlaps in their service areas. Both airports have different roles in the regional system, and both are publicly-owned. As shown previously in Tables 6-1 and 6-2, current concentrations of population and employment in the service areas for Midwest National Air Center and Excelsior Springs Memorial are on the lower end of the spectrum when all study airports are considered. Tables 6-3 and 6-4 show that rates of growth for population and employment in the service areas for these two airports are also more modest than for other study airports. Both of these airports have public sponsors that provide funding support which increases their financial viability. Both airports should maintain their current system roles. These two publicly-owned airports have the capacity to serve as back-up facilities for the privately-owned Roosterville Airport.

- Also in the northern part of the study area, Noah's Ark serves higher levels of population and employment within its 10-mile service area. The growth rate for population in this airport's service area is above the average, and the anticipated growth rate for employment in this airport's service area is among the highest for all study airports. Noah's Ark is also privately-owned, and it is a Community Airport in the regional system. Noah's Ark has overlapping service areas with other public airports in the regional system - Sherman Army Airfield, Kansas City International, and Charles B. Wheeler Downtown. While the financial viability of these other study airports is sound, all have some landside development limitations. Noah's Ark plays a notable role in serving general aviation needs in the study area and should maintain its role as a Community Airport.
- Kansas City International serves commercial airline and most air cargo/air freight needs for the study area. This airport serves the needs of larger transient general aviation aircraft visiting the area and accommodates some larger, high performance based general aviation planes. Kansas City International has overlapping service areas with both Noah's Ark and Roosterville. The longer term viability of these two Community airports is less certain because of their private ownership. Kansas City International will maintain its Commercial Airport role in the regional system, serving a more limited but important role in accommodating general aviation demand. This major commercial airport is not an appropriate candidate for serving as a back-up for the two privately-owned airports in its vicinity.
- Sherman Army Airfield (Business Airport) is owned by the DOD that maintains control of the airfield facilities with a small area designated and leased for landside facilities to serve the general public. This area is leased by DOD to the city of Leavenworth, Kansas. The DOD may terminate this lease at their discretion. Since the airfield facilities at this study airport are owned by the military and the public-use area for landside development is limited in acreage, the longer term viability of this facility to play a larger role in serving regional aviation demand has limitations. The 10-mile service area for this airport has some of the lower concentrations of both population and employment. Future rates of growth for population and employment, in this airport's service area, are around 20 percent, which is on the lower end of the growth spectrum for the study airports.

Based on growth and ownership limitations for Sherman Army Airfield, a prior statewide aviation system plan for Kansas recommended a new general aviation airport to serve the Leavenworth, Kansas area. Formal application from the Kansas Department of Transportation to the FAA was made for a new general aviation airport to serve this area. Several airport sites were identified and investigated in FAA-funded studies. At the time the studies were completed, FAA reserved airspace for a new airport to serve this part of the study area. Local support to proceed with the development of a new airport, however, was not sufficient to move the project to implementation.

At this time, the airspace reservation for a new airport has expired. The FAA's National Plan for Integrated Airport Systems (NPIAS), however, still has a placeholder for a new airport in this area of Kansas. As part of their participation in the system plan, FAA indicated they still recognize the need for a new public general aviation airport in this part of the study area. Given the private-ownership at Noah's Ark, combined with limited general aviation development opportunities at Sherman Army Airfield and Kansas City International, this system plan concurs with FAA's NPIAS and includes a placeholder for a new general aviation airport in the Leavenworth/Wyandotte County area. This

system plan also recommends that this new airport be included in any future updates to the Kansas Aviation System Plan. At a minimum, any new airport developed in this part of the study area should be planned to meet at least the characteristics of a Business Airport; but ideally, a new airport should have the potential to meet all characteristics of a Regional Airport.

- The service area for Charles B. Wheeler Downtown Airport has the highest concentrations of employment and population among all study airport service areas. Between 2010 and 2040, however, the airport's 10-mile service area is only expected to experience an 8 percent increase in population and an 11 percent increase in employment. These rates of anticipated growth are the lowest among all study airports. Designated as a Regional Airport in the regional system, this airport is targeted to have facilities and services to meet the demands of all system users. While the airport has sufficient operational capacity, future landside capacity is limited by the airport's land envelope. This airport will continue to play a significant role in meeting the general aviation needs of the study area. The airport should maintain its current system role.
- The southwestern portion of the study area has higher concentrations of the region's population and employment. This area is well served by publicly-owned airports that are each assigned to different roles in the regional system. The service areas for these study airports are expected to have some of the highest rates of population and employment growth. Growth in population and employment are factors that often contribute to growth in aviation demand. Between 2010 and 2040, population in the 10-mile service area for New Century Air Center, Gardner Municipal and Johnson County Executive are expected to increase at 78, 86, and 47 percent, respectively; population in the Gardner Municipal service area is expected have the highest rate of increase among all airport service areas. The rate of growth for employment in these same airport service areas is also expected to be relatively high at 86, 83, and 46 percent, respectively. With an anticipated 86 percent increase between 2010 and 2040, employment in the service area for New Century Air Center is expected to be the second highest, following only Kansas City International. This part of the study area is served by airports that are balanced and is in a good position to accommodate increased aviation demand. This regional system plan recommends that Johnson County Executive, Gardner Municipal, New Century Air Center, and Miami County all maintain their current roles in the regional system.
- The southeastern portion of the study area is served by the Lee's Summit (Regional), Lawrence Smith (Regional) and the East Kansas City (Regional) airports. The service area for Lee's Summit contains some of the highest concentrations of both employment and population. East Kansas City also ranks in the top half of all study airports for concentrations of population and employment in its service area. However, the service areas for Lee's Summit and East Kansas City rank in the bottom half of all study airports for their anticipated rates of growth between 2010 and 2040 for both population and employment. While Lee's Summit is publicly-owned, East Kansas City is privately-owned which makes it susceptible to potential financial limitations noted for such airports in the system. Lee's Summit is currently undergoing an expansion of its airfield facilities that will strengthen its role in the regional system. Given possible financial limitations and development obstacles in relationship to meeting the facility objectives for a Regional Airport, the system plan recommends a future role for East Kansas City as a Business Airport.
- Miami County and Lee's Summit should maintain their current system roles.

- Lawrence Smith Memorial (Regional) has lower concentrations of both employment and population in its service area. When compared to population and employment in the service areas for other study airports, the rate for growth for these two indicators is anticipated to be modest for the airport. For population and employment between 2010 and 2040, growth is expected to be 41 and 28 percent, respectively, for Lawrence Smith. A Regional airport role for Lawrence Smith appears to be overmatched to (current and future) characteristics, of the airport's service area. As a result, the plan's recommends changing this airport's role in the regional system from Regional to Business.

Regional Activity Centers and the Recommended Airport System

After the regional system was defined, the alignment of airports with activity centers previously identified by MARC was determined. Figure 6-2 shows the relationship of airports and their 10-mile service areas to MARC's designated activity centers.

Activity centers are places where people shop, work, live, recreate, learn, and gather. Centers are typically located in highly visible locations, easily accessible by surrounding neighborhoods and other parts of the region. The size, mix of uses, and intensity of development in each activity center varies with the availability of land, access, surrounding development, transit services, and other considerations.

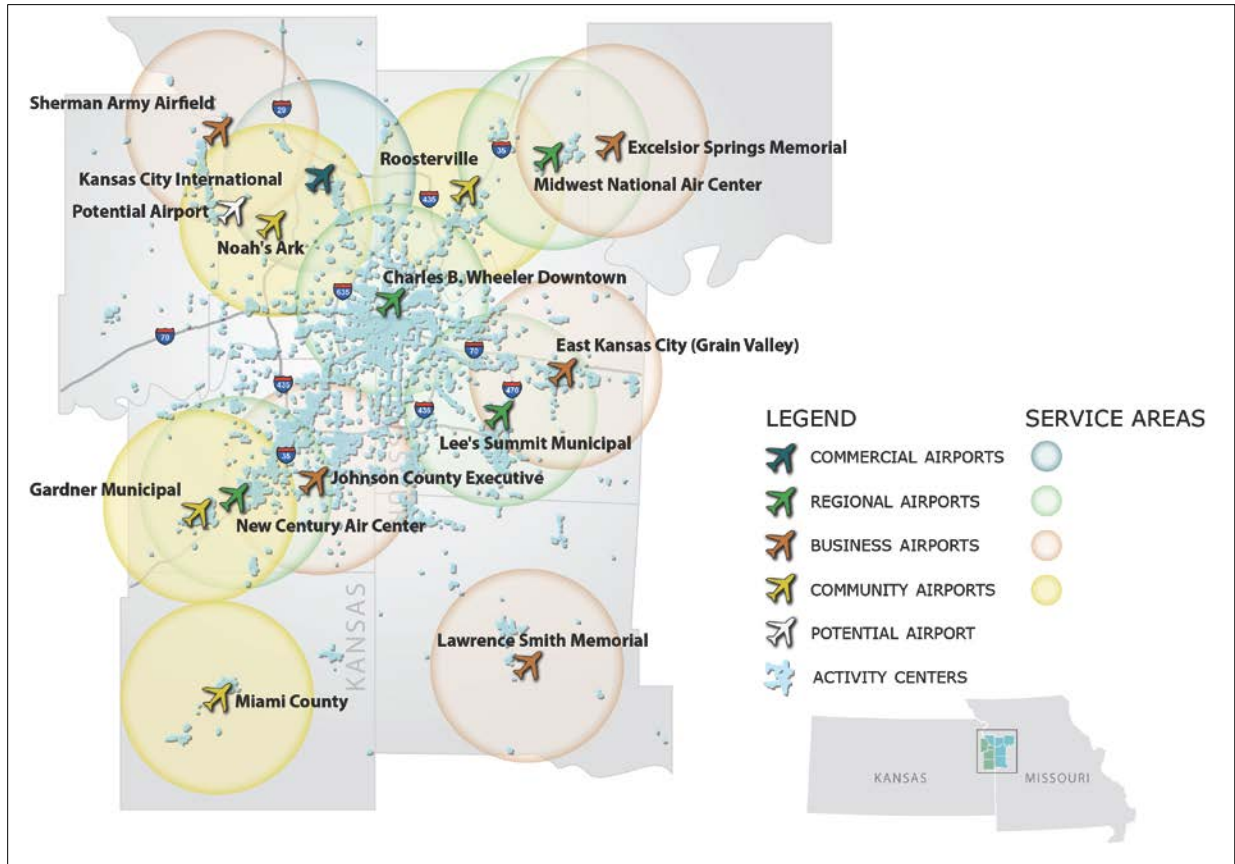
Activity centers are part of MARC's land-use growth strategy, and the activity centers were identified as part of the region's population growth forecast. These activity centers are part of the Kansas City region's long-range metropolitan transportation plan, *Transportation Outlook 2040*. By helping to provide a vision for growth, the activity centers help to support established regional goals for financial, environmental, and social sustainability.

By identifying these activity centers for regional planning efforts, MARC and its partners recognize that growth in the region will continue to reflect historical trends. Existing and emerging activity centers, as identified by MARC, tend to follow the region's key transportation corridors. MARC originally identified the activity centers, reflected in Figure 6-2, by identifying parcels, other than vacant land and single-family homes, that are less than eight acres in size. Once identified, these parcels, their location, and their shapes became the basis for the activity centers.

Regional goals for land use and transportation call for focused development and redevelopment of places that offer access to employment, goods, services, and transit for all residents. Activity centers help to promote efficient land use that supports a strong regional economy, while protecting natural resources and safe and healthy living. Again, Figure 6-2 identifies activity centers with the highest concentrations of people, jobs, and/or areas supportive of walkability. These activity centers contribute to a vibrant, connected, and green region.

Access to transportation resources is a key designation component for the region's activity centers. Jobs and the movement of goods and services often benefit from being in proximity to aviation facilities. As Figure 6-2 shows, most of the designated activity centers are within one or more 10-mile airport service areas. Access to air transportation services provides another resource that helps contribute to the successful development or re-development of the designated activity centers. The recommended system is well aligned to support the region's activity centers as they have been identified by MARC.

Figure 6-2 - Recommended System and Activity Centers

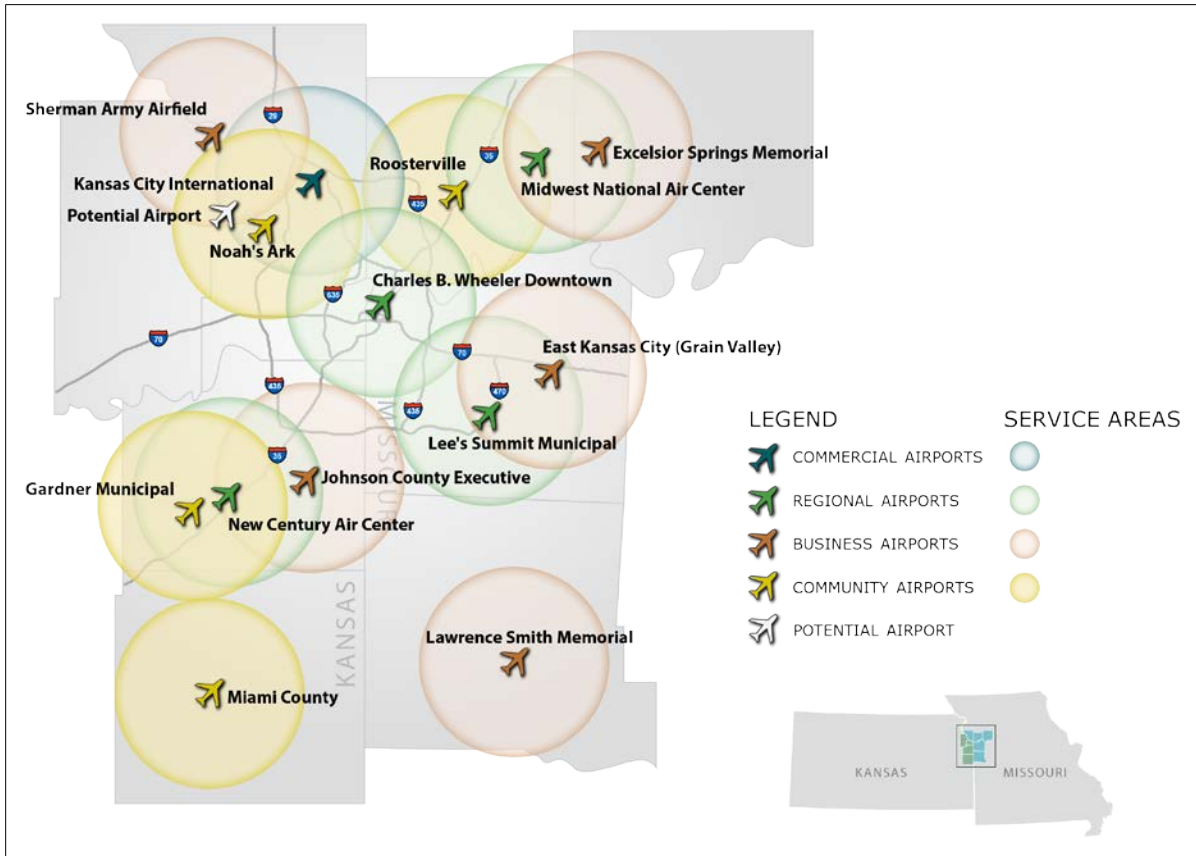


Source: Jviation, Inc.

Recommended System

Figure 6-3 shows the recommended system. Key changes to the system included changing the roles for East Kansas City and Lawrence Smith from Regional to Business. The recommended system also includes a placeholder for a new airport in the Leavenworth/Wyandotte county area of Kansas. Based on these recommendations, the next chapter of the regional system plan identifies appropriate steps to elevate the performance of the airport system serving the nine-county study area. These steps, along with system changes and additions identified in this chapter, will serve as input for the recommended plan.

Figure 6-3 - Recommended System and Airport Roles



Source: Jviation, Inc.

Chapter Seven: Future System Performance

Prior analysis was completed for the regional airport system to gauge current performance. A series of framework goals and performance measures, specific to the system plan, were used to guide the evaluation. Each performance measure was reviewed so that current system performance was identified by airport role, as well as for the system as a whole. To support the evaluation, as presented in Chapter 5, each study airport was reviewed to determine its current ability to meet or comply with each of the performance measures.

Results of this system evaluation process were presented to MARC, FAA, MoDOT, KDOT and other members of the Project Steering Committee. This presentation focused on the need or the desire for each airport included in the system plan to be compliant with each performance measure. Members of the Project Steering Committee and representatives from each of the study airports helped to make this determination and to set targets for future system performance.

Both groups participated in an online survey to provide direct input for establishing targets for each performance measure. By indicating which airport role categories should fully meet or comply with each of the performance measures, the Steering Committee and the study airports established targets for future system performance. These targets, in turn, identify where actions are needed for each airport to improve the overall performance of the regional airport system.

Table 7-1 summarizes the results of this process and provides the following information:

- A list of system plan framework goals and associated performance measures.
- Information showing which study airports, by role, should be fully compliant with each performance measure (per input from study airports and the Project Steering Committee).
- Current system-wide and target performance for all study airports, assuming all study airports take action to meet target performance identified for their respective system role.
- Identification of airports, by performance measure and role, where action is needed to improve system performance to meet the established targets.

The target performance identified in Table 7-1 should be viewed as an objective rather than a requirement. For example, a target was established by the Steering Committee for all Regional airports to be served by public transportation/transit. Providing such service is beyond the actual control of the airport. Further, an airport's lack of public transit/transportation does not indicate that the study airport is incapable of fulfilling its assigned role in the regional system. Airport-specific actions identified in this chapter of the plan should not be viewed as being mandatory; however, these actions could contribute to the improvement of overall system performance.

Table 7-1 - System Performance Targets

Framework Goal: Financial Performance/Revenue Enhancement				
Performance Measures	Target Performance Objectives		Current and Target System-wide Performance	Airports Needing Action to Reach Their Performance Measure Objective
Identify on-airport properties open for <i>aviation</i> development	Regional	Yes	Current: 62% Target: 100%	Regional: All Meet Objective; No Action Needed
	Business	Yes		Business: East Kansas City, Excelsior Springs, Sherman Army Airfield
	Community	Yes		Community: Noah's Ark, Roosterville
Identify on-airport properties open for <i>non-aviation</i> development	Regional	Yes	Current: 46% Target: 100%	Regional: All Meet Objective; No Action Needed
	Business	Yes		Business: East Kansas City, Lawrence Smith, Excelsior Springs, Sherman Army Airfield
	Community	Yes		Community: *Gardner Municipal, Noah's Ark, Roosterville
Work together with communities to attract aviation dependent businesses to the airport environs	Regional	Yes	Current: 54% Target: 100%	Regional: All Meet Objective; No Action Needed
	Business	Yes		Business: East Kansas City, Lawrence Smith, Excelsior Springs, Sherman Army Airfield
	Community	Yes		Community: Noah's Ark, Roosterville
Framework Goal: Environmental Performance/Land Use Compatibility				
Performance Measures	Target Performance Objectives		Current and Target System-wide Performance	Airports Needing Action to Reach Their Performance Measure Objective
Include all airports in Comprehensive Plans: all surrounding municipalities	Regional	Yes	Current: 77% Target: 100%	Regional: All Meet Objectives; No Action Needed
	Business	Yes		Business: East Kansas City
	Community	Yes		Community: Noah's Ark, Roosterville
Have height zoning as per 14 CFR Part 77: all surrounding municipalities	Regional	Yes	Current: 14% Target: 100%	Regional: Charles B. Wheeler Downtown, Lee's Summit, Midwest Air Center
	Business	Yes		Business: East Kansas City, Lawrence Smith, Excelsior Springs, Sherman Army Airfield
	Community	Yes		Community: Gardner Municipal, Miami County, Noah's Ark
Have land use controls in place that prevent airport encroachment: all surrounding municipalities	Regional	Yes	Current: 43% Target: 100%	Regional: Lee's Summit, Midwest Air Center
	Business	Yes		Business: Excelsior Springs, Sherman Army Airfield
	Community	Yes		Community: Miami County, Noah's Ark, Roosterville

Table 7-1 - System Performance Targets

Performance Measures	Target Performance Objectives	Current and Target System-wide Performance	Airports Needing Action to Reach Their Performance Measure Objective
Have a current noise contour	Regional	Yes	Regional: Midwest National Air Center
	Business	Yes	Business: East Kansas City, Lawrence Smith, Excelsior Springs, Sherman Army Airfield
	Community	No	Community: Not An Objective; No Action Needed

Framework Goal: Environmental Performance/Environmental Compatibility

Performance Measures	Target Performance Objectives	Current and Target System-wide Performance	Airports Needing Action to Reach Their Performance Measure Objective
Have a Stormwater Management Plan	Regional	Yes	Regional: Charles B. Wheeler Downtown
	Business	Yes	Business: East Kansas City, Lawrence Smith, Excelsior Springs
	Community	No	Community: Not an Objective; No Action Needed
Have a Wildlife Hazard Assessment or Plan	Regional	Yes	Regional: All Meet Objective; No Action Needed
	Business	Yes	Business: East Kansas City, Lawrence Smith, Excelsior Spring
	Community	No	Community: Not an Objective; No Action Needed
Have a Spill Prevention/Control Plan	Regional	Yes	Regional: All Meet Objective; No Action Needed
	Business	Yes	Business: East Kansas City, Excelsior Springs, Sherman Army Airfield
	Community	Yes	Community: Gardner Municipal, Noah's Ark

Framework Goal: Environmental Performance/Environmental Sustainability

Performance Measures	Target Performance Objectives	Current and Target System-wide Performance	Airports Needing Action to Reach Their Performance Measure Objective
Have plans to increase efficient use of water	Regional	Yes	Regional: Charles B. Wheeler Downtown, Midwest Air Center, New Century Air Center
	Business	Yes	Business: East Kansas City, Lawrence Smith, Excelsior Springs, Johnson County, Sherman Army Airfield
	Community	No	Community: Not an Objective; No Action Needed

Table 7-1 - System Performance Targets

Performance Measures	Target Performance Objectives	Current and Target System-wide Performance	Airports Needing Action to Reach Their Performance Measure Objective
Have plans to increase the efficient use of energy in buildings	Regional	Yes	Regional: Charles B. Wheeler Downtown, Midwest Air Center
	Business	Yes	Current: 31% Target: 69% Business: East Kansas City, Lawrence Smith, Excelsior Springs
	Community	No	Community: Not an Objective; No Action Needed
Have plans to reduce solid waste generation	Regional	Yes	Regional: Charles B. Wheeler Downtown, Midwest Air Center, New Century Air Center
	Business	Yes	Current: 15% Target: 69% Business: East Kansas City, Lawrence Smith, Excelsior Springs, Johnson County
	Community	No	Community: Not an Objective; No Action Needed
Have plans to use energy efficiency vehicles	Regional	No	Regional: Not an Objective; No Action Needed
	Business	No	Current: 15% Target: None Set Business: Not an Objective; No Action Needed
	Community	No	Community: Not an Objective; No Action Needed
Have programs to promote recycling	Regional	Yes	Regional: All Meet Objective: No Action Needed
	Business	Yes	Current: 62% Target: 100% Business: Lawrence Smith, Sherman Army Airfield
	Community	Yes	Community: Gardner Municipal, Miami County, Noah's Ark

Framework Goal: Social Performance/Airport Accessibility

Performance Measures	Target Performance Objectives	Current and Target System-wide Performance	Airports Needing Action to Reach Their Performance Measure Objective
Have on-site ground transportation services (i.e. rental cars, courtesy cars, taxi, etc)	Regional	Yes	Regional: All Meet Objective; No Action Needed
	Business	Yes	Current: 69% Target**: 69% Business: East Kansas City, Excelsior Springs
	Community	No	Community: Not an Objective; No Action Needed
Have adequate public signage from area roadways	Regional	Yes	Regional: Midwest National Air Center
	Business	Yes	Current**: 77% Target: 69% Business: Sherman Army Airfield
	Community	No	Community: Not an Objective; No Action Needed

Table 7-1 - System Performance Targets

Performance Measures	Target Performance Objectives		Current and Target System-wide Performance	Airports Needing Action to Reach Their Performance Measure Objective
Be served by public transit	Regional	Yes	Current: 23% Target: 31%	Regional: Lee's Summit, Midwest Air Center
	Business	No		Business: Not an Objective; No Action Needed
	Community	No		Community: Not an Objective; No Action Needed
Have regular assessments of annual economic impact	Regional	Yes	Current: 85% Target: 100%	Regional: All Meet Objective: No Action Needed
	Business	Yes		Business: All Meet Objective: No Action Needed
	Community	Yes		Community: Noah's Ark, Roosterville
Have website/newsletter for regular communication	Regional	Yes	Current**: 85% Target: 69%	Regional: All Meet Objective; No Action Needed
	Business	Yes		Business: All Meet Objective; No Action Needed
	Community	No		Community: Not an Objective; No Action Needed
Use social media to communicate on a regular basis	Regional	Yes	Current**: 54% Target: 31%	Regional: All Meet Objective; No Action Needed
	Business	No		Business: Not an Objective; No Action Needed
	Community	No		Community: Not an Objective
Have an airport board/advisory committee	Regional	Yes	Current**: 85% Target: 69%	Regional: All Meet Objective; No Action Needed
	Business	Yes		Business: All Meet Objective; No Action Needed
	Community	No		Community: Not an Objective; No Action Needed
Attend meetings of surrounding municipalities	Regional	Yes	Current**: 85% Target: 69%	Regional: All Meet Objective; No Action Needed
	Business	Yes		Business: All Meet Objective; No Action Needed
	Community	No		Community: Not an Objective; No Action Needed

*Prior planning at Gardner Municipal Airport has shown that there is no property available for non-aviation development.

** Airports in the Business or Community role currently meet this objective causing target object to be exceeded.

Table 7-2 provides detailed information on actions that are needed to make all system airports more fully compliant with objectives as they relate to compatible land-use controls and height zoning ordinances that follow 14 CFR Part 77. Each study airport is surrounded by multiple municipalities. As a result, for airports to be fully compliant with objectives for compatible land-use planning and height zoning restrictions, cooperation from several jurisdictions is necessary.

As Table 7-2 shows, for several airports, some, but not all, surrounding jurisdictions have taken steps to enact appropriate land-use compatibility controls and/or to implement zoning that is consistent with 14 CFR Part 77 height restrictions. Of the 43 jurisdictions shown in Table 7-2, 40 percent have height zoning restrictions, and 81 percent have adopted land-use controls. For airports accepting federal (FAA) and state grants, in order for these airports to be compliant with the covenants of their grant assurances, both compatible land use controls and appropriate height zoning restrictions should be in place. Specific FAA requirements, for obligated airports in the NPIAS, under grant assurances related to height restriction and land use include:

- FAA Grant Assurance 20, Hazard Removal and Mitigation: *It will take appropriate action to assure that such terminal airspace as is required to protect instrument and visual operations to the airport (including established minimum flight altitudes) will be adequately cleared and protected by removing, lowering, relocating, marking, or lighting or otherwise mitigating existing airport hazards and by preventing the establishment or creation of future airport hazards.*
- FAA Grant Assurance 21, Compatible Land Use: *It will take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. In addition, if the project is for noise compatibility program implementation, it will not cause or permit any change in land use, within its jurisdiction, that will reduce its compatibility, with respect to the airport, of the noise compatibility program measures upon which Federal funds have been expended.*

Note: The FAA considers it reasonable for a municipality that owns and operates an airport to adopt zoning laws within their municipal jurisdiction.

Table 7-2 - Jurisdictions Where Action is Needed to Meet Land Use Control and Height Zoning Objectives

Airport	NPIAS Airports	Planning Jurisdictions	Adopted Height Restriction Ordinance	Land Use Controls
Regional Airports				
Charles B. Wheeler Downtown	Yes	Kansas City, MO North Kansas City, MO Kansas City, KS	Needed Needed Needed	In Place In Place In Place
Lee's Summit Municipal	Yes	Lee's Summit, MO Unity Village, MO Kansas City, MO	In Place Needed Needed	In Place Needed In Place
Midwest National Air Center	Yes	Clay County, MO Kearney, MO Mosby, MO Excelsior Springs, MO Prathersville, MO	In Place Needed Needed Needed Needed	In Place In Place Needed In Place Needed
New Century Air Center	Yes	Johnson County, KS Gardner, KS Olathe, KS	In Place In Place In Place	In Place In Place In Place
Business Airports				
East Kansas City	No	Grain Valley, MO Jackson County, MO Blue Springs, MO	Needed Needed Needed	In Place In Place In Place

Table 7-2 - Jurisdictions Where Action is Needed to Meet Land Use Control and Height Zoning Objectives

Airport	NPIAS Airports	Planning Jurisdictions	Adopted Height Restriction Ordinance	Land Use Controls
Excelsior Springs Memorial	No	Excelsior Springs, MO Ray County, MO	Needed In Place	In Place Needed
Lawrence Smith Memorial	Yes	City of Harrisonville, MO Cass County, MO	Needed In Place	In Place In Place
Johnson County Executive	Yes	Johnson County, KS Olathe, KS Overland Park, KS	In Place In Place In Place	In Place In Place In Place
Sherman Army Airfield	No	Ft. Leavenworth, KS Leavenworth County, KS City of Leavenworth, KS Weston, MO Platte County, MO	Needed In Place In Place Needed In Place	In Place In Place In Place Needed In Place
Community Airports				
Gardner Municipal	Yes	City of Gardner, KS Edgerton, KS Johnson County, KS	In Place Needed Needed	In Place In Place In Place
Miami County	Yes	Miami County, KS Osawatomie, KS	In Place Needed	In Place Needed
Noah's Ark	No	Waldron, MO Lansing, KS Platte County, MO Parkville, MO Leavenworth County, KS Farley, MO	Needed Needed In Place Needed In Place Needed	Needed In Place In Place In Place In Place Needed
Roosterville	No	Clay County, MO Liberty, MO Kansas City, MO	Needed Needed Needed	In Place In Place In Place

Source: Greater Kansas City Regional Airport System Plan, Airport Reporting during on-site inventory visits.

Target performance, by airport role and performance measure, is provided for reference to highlight actions that can be considered to enhance the performance of the regional airport system. Aviation system plans by their nature are top-down planning studies that still must be implemented from the bottom up. As each airport in the regional system moves forward with planning and development efforts, it should consider the information in Table 7-1. By undertaking steps to become fully compliant with performance measures that are appropriate for each study airport, given its assigned role in the regional system, the performance of the regional airport system will improve.

Table 7-3 provides a summary of actions, by study airport, that are considered desirable to increase system performance. Some actions identified in Table 7-3 may involve modest costs. For such cases, costs will be identified in Chapter 9. In other instances, while action is involved, there are no costs associated with compliance to improve system performance.

Table 7-3 - Actions to Improve System Performance by Study Airport

Airport	Actions to Improve System Performance
Regional Airports	
Charles B. Wheeler Downtown	<ul style="list-style-type: none"> • Work with surrounding municipalities to enact height zoning following Part 77. • Establish a stormwater management plan. • Establish a plan to promote the efficient use of water. • Establish a plan to promote the efficient use of energy in buildings. • Establish a plan to reduce the generation of solid waste.
Lee's Summit Municipal	<ul style="list-style-type: none"> • Work with surrounding municipalities to enact height zoning following Part 77. • Work with surrounding municipalities to adopt land-use controls to prevent airport encroachment. • Have access to public transit
Midwest National Air Center	<ul style="list-style-type: none"> • Work with surrounding municipalities to enact height zoning following Part 77. • Work with surrounding municipalities to adopt land-use controls to prevent airport encroachment • Develop a noise contour to identify areas surrounding the airport that lie within it. • Establish a plan to promote the efficient use of water. • Create a plan to promote the efficient use of energy in buildings. • Establish a plan to reduce the generation of solid waste. • Improve public signage for area roadways. • Establish access to public transit. • Improve entrance roadway.
New Century Air Center	<ul style="list-style-type: none"> • Establish a plan to promote the efficient use of water.
Business Airports	
East Kansas City	<ul style="list-style-type: none"> • Identify on-airport properties open for aviation related development. • Identify on-airport properties open for non-aviation development. • Work with surrounding jurisdictions to attract aviation dependent employers to the airport environs. • Work with surrounding jurisdictions to have the airport included in their comprehensive plan. • Work with surrounding municipalities to enact height zoning following Part 77. • Develop a noise contour to identify areas surrounding to airport that lie within it. • Establish a stormwater management plan. • Conduct a wildlife hazard assessment. • Develop a spill prevention and control plan. • Establish a plan to promote the efficient use of water. • Create a plan to promote the efficient use of energy in buildings. • Establish a plan to reduce the generation of solid waste.

Table 7-3 - Actions to Improve System Performance by Study Airport

Airport	Actions to Improve System Performance
Excelsior Springs Memorial	<ul style="list-style-type: none"> • Work to establish/provide ground transportation options. • Identify on-airport properties open for aviation-related development. • Identify on-airport properties open for non-aviation development. • Work with surrounding jurisdictions to attract aviation-dependent employers to the airport environs. • Work with surrounding municipalities to enact height zoning following Part 77. • Work with surrounding municipalities to adopt land-use controls to prevent airport encroachment. • Develop a noise contour to identify areas surrounding to airport that lie within it. • Establish a stormwater management plan. • Conduct a wildlife hazard assessment. • Develop a spill prevention and control plan. • Establish a plan to promote the efficient use of water. • Establish a plan to promote the efficient use of energy in buildings. • Establish a plan to reduce the generation of solid waste. • Work to establish/provide ground transportation options.
Johnson County Executive	<ul style="list-style-type: none"> • Conduct a wildlife hazard assessment. • Establish a plan to promote the efficient use of water. • Establish a plan to reduce the generation of solid waste.
Lawrence Smith Memorial	<ul style="list-style-type: none"> • Identify on-airport properties open for non-aviation development. • Work with surrounding jurisdictions to attract aviation-dependent employers to the airport environs. • Work with surrounding municipalities to enact height zoning following Part 77. • Develop a noise contour to identify areas surrounding to airport that lie within the contour. • Establish a stormwater management plan. • Conduct a wildlife hazard assessment. • Establish a plan to promote the efficient use of water. • Establish a plan to promote the efficient use of energy in buildings. • Establish a plan to reduce the generation of solid waste. • Establish a program to promote recycling.
Sherman Army Airfield	<ul style="list-style-type: none"> • Identify on-airport properties open for aviation-related development. • Identify on-airport properties open for non-aviation development. • Work with surrounding jurisdictions to attract aviation-dependent employers to the airport environs. • Work with surrounding municipalities to enact height zoning following Part 77. • Work with surrounding municipalities to adopt land-use controls to

Table 7-3 - Actions to Improve System Performance by Study Airport

Airport	Actions to Improve System Performance
	<p>prevent airport encroachment</p> <ul style="list-style-type: none"> ● Develop a noise contour to identify areas surrounding to airport that lie within it. ● Develop a spill prevention and control plan. ● Improve public signage from area roadways. ● Establish a plan to promote the efficient use of water. ● Establish a program to promote recycling.
Community Airports	
Gardner Municipal	<ul style="list-style-type: none"> ● Work with surrounding municipalities to enact height zoning following Part 77. ● Develop a spill prevention and control plan. ● Establish a program to promote recycling.
Miami County	<ul style="list-style-type: none"> ● Work with surrounding municipalities to enact height zoning following Part 77. ● Work with surrounding municipalities to adopt land-use controls to prevent airport encroachment. ● Establish a program to promote recycling.
Noah's Ark	<ul style="list-style-type: none"> ● Identify on-airport properties open for aviation-related development. ● Identify on-airport properties open for non-aviation development. ● Work with surrounding jurisdictions to attract aviation-dependent employers to the airport environs. ● Work with surrounding jurisdictions to have the airport included in their comprehensive plans. ● Work with surrounding municipalities to enact height zoning following Part 77. ● Work with surrounding municipalities to adopt land use controls to prevent airport encroachment. ● Develop a spill prevention and control plan. ● Establish a program to promote recycling. ● Assess economic impact. ● Improve entrance road.
Roosterville	<ul style="list-style-type: none"> ● Identify on-airport properties open for aviation-related development. ● Identify on-airport properties open for non-aviation development. ● Work with surrounding jurisdictions to attract aviation-dependent employers to the airport environs. ● Work with surrounding jurisdictions to have the airport included in their comprehensive plans. ● Work with surrounding municipalities to adopt land-use controls to prevent airport encroachment. ● Assess economic impact.

Source: Greater Kansas City Regional Airport System Plan Airport Reporting During On-Site Inventory Visits.

Chapter 8 of the system plan reviews the ability of each study airport to meet facility, service, and equipment objectives established for its particular role in the regional system. Findings from the performance measure evaluation presented in this chapter and findings from the following chapter are combined to support the recommended plan.

Chapter Eight: Future Airport Performance

Introduction

Analysis completed in the Chapter 7: Future Airport Roles, along with input from the Project Steering Committee, helped to set future roles for each of the study airports in the regional system. Based on each airport's future role, facility and service objectives are used to determine each airport's level of performance relative to its recommended role. Facility and service objectives for Business, Regional, and Community Airports have been established in the system plan and are presented in Chapter 4. These objectives were established to enable system airports to best fulfill their assigned system role.

It is important to note that facility objectives established in the system plan are not requirements. The objectives are provided to provide guidance to each airport on how it should best develop to meet regional transportation needs. When airports undertake individual planning efforts, the objectives should be considered. It is recognized that as a result of environmental, land use, financial, political, and other constraints that airports in the regional system may not be able to meet some or even all of their objectives. It is just as likely that, based on their individual needs, airports may need to exceed facility and service objectives in this plan.

Facility and service objectives contained in this plan are not all encompassing. Airports will have additional expansion, maintenance, and rehabilitation projects that are not included in the system plan objectives. Specific facility and service adequacies and deficiencies identified in this chapter provide the foundation for final recommendations for the regional airport system, as well as for individual study airports. Facility and service objectives for the study airports include:

- Airport Reference Code (ARC)
- Primary Runway Length
- Primary Runway Width
- Taxiway
- PCI
- Navigational Aids
- Approach Type
- Lighting
- Weather
- Hangar Storage
- Apron Tie-Downs
- Terminal/Administration Building
- Auto Parking
- Ground Communication
- Services

Airport Reference Code (ARC) Objective

Each airport included in the National Plan of Integrate Airport Systems (NPIAS) is encouraged to meet all applicable FAA design and development standards. While some study airports are non-NPIAS, best planning practices incorporated into this study indicate that, whenever feasible, all study airports should attempt to comply with FAA design standards.

The most demanding aircraft that operate at an airport on a regular basis, with at least 500 takeoffs and landings annually, determines each airport's design standards. This aircraft is known as the design or critical aircraft. An airport's design standards are typically established during the development of an airport-specific master plan or airport layout plan (ALP). Each airport's design standards are related to the approach speed and the wingspan of its design aircraft. These two criteria are used to determine each airport's Airport Reference Code (ARC).

The current ARC for each system airport is presented in Table 8-1. Figure 8-1 presents compliance with the ARC objective by airport role and for the overall system. System-wide, only two study airports, East Kansas City and Excelsior Springs, do not meet their ARC objective as established by the system plan.

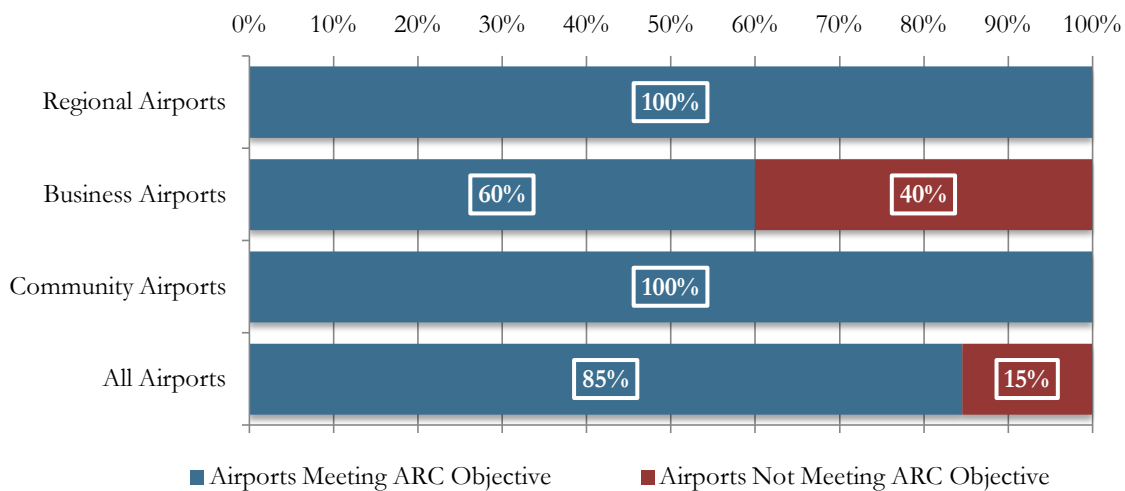
Table 8-1 - ARC Compliance by Airport

Airport	Current ARC	Meets Objective
Regional Airports: ARC B-II		
Charles B. Wheeler Downtown	D-IV	Yes
Lee's Summit Municipal*	B-II	Yes
Midwest National Air Center	C-II	Yes
New Century Air Center	C/D-II	Yes
Business Airports: ARC B-II		
East Kansas City	B-I	No
Excelsior Springs Memorial	A-I	No
Johnson County Executive	B-II	Yes
Sherman Army Airfield	B-II	Yes
Lawrence Smith Memorial	B-II	Yes
Community Airports: ARC A-I		
Gardner Municipal (KS)	A-I	Yes
Miami County (KS)	B-I	Yes
Noah's Ark (MO)	A-I	Yes
Roosterville (MO)	A-I	Yes

Source: Airport Inventory and Data Survey 2015, Airport Records

Note: *The ARC will be C-II for Lee's Summit Municipal when its current runway project is completed.

Figure 8-1 - Percent of Airports by Role that Meet ARC Objective



Primary Runway Length Objectives

Adequate runway facilities are important to the foundation of the region's airfield system. System objectives for runway length and width are based on trends that are occurring within the aviation industry, previously reviewed in Chapter 3: Outlook for Future Demand. One growing segment of the general aviation fleet is business jet aircraft. These aircraft often require a minimum runway length of 5,000 feet. The National Business Aviation Association (NBAA) recently released "guidelines" developed by their nationwide membership that help define the characteristics that should be present at varying types of business category airports. Their guidelines suggest a 5,500-foot long runway at a large business airport and 5,000-feet for a medium business airport. As a result, 5,000 feet was set as the runway length objective for Regional Airports in this study. Business jet aircraft that typically need a minimum of 5,000 feet of runway and are currently operating at airports in the Kansas City region include: Cessna Citations, Gulfstreams, Learjets, and Beechcraft Hawkers.

A review of the current primary runway length at each study airport is presented in Table 8-2. Airports that exceed their minimum primary runway length objective should maintain their existing runway infrastructure. As shown in Figure 8-2, 77 percent of the study airports meet the runway length objective for their primary runway. It is important to note that Lee's Summit Municipal Airport is in the midst of a development plan that will extend its primary runway from 4,016 feet to 5,500 feet. FAA and MoDOT funding has already been committed for this development. When complete, the airport will meet the runway length objective for its system role.

Similarly, Gardner Municipal Airport is in the middle of a major planning project that seeks to address compliance concerns, along with evaluating its runway system. However, the planning effort is not complete. At this time, an FAA approved ALP has not been developed nor have FAA or KDOT funds been committed to any runway related projects at the airport. It is possible that the recommendations from this local planning effort could result in additional and/or different improvements needed than those identified in this regional system plan. The airport's on-going planning process has the potential to impact not only the airport's ability to meet its runway length objective but also other facility objectives discussed in this chapter. The Gardner Municipal Airport is one of three public-use airports in Johnson County. The airport tends to support recreational use, while the other two airports have more business users. The airport's customer base and specific circumstances are being considered in the airport's on-going airport master plan and ALP updates.

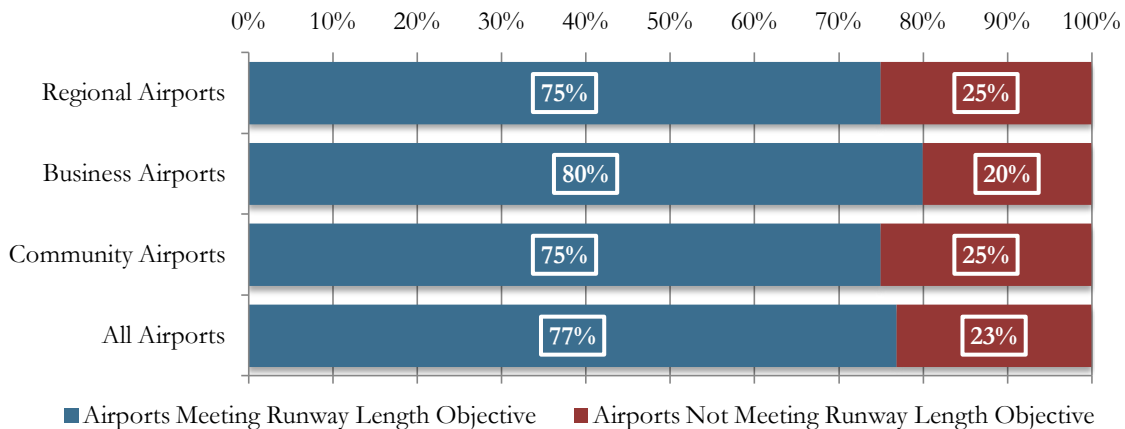
Table 8-2 - Runway Length Compliance by Airport

Airport	Primary Runway Length (ft)	Meets Objective
Regional Airports: 5,000'		
Charles B. Wheeler Downtown	6,827	Yes
Lee's Summit Municipal	4,016*	No
Midwest National Air Center	5,504	Yes
New Century Air Center	7,339	Yes
Business Airports: 4,000'		
East Kansas City	4,507	Yes
Excelsior Springs Memorial	2,000	No
Johnson County Executive	4,098	Yes
Sherman Army Airfield	5,318	Yes
Lawrence Smith Memorial	4,000	Yes
Community Airports: Kansas - 3,200' Missouri - Maintain Existing		
Gardner Municipal (KS)	2,960	No
Miami County (KS)	3,398	Yes
Noah's Ark (MO)	3,000	Yes
Roosterville (MO)	2,780	Yes

Source: Airport Inventory and Data Survey 2015, Airport Records

*Lee's Summit Municipal is undergoing development that will result in its primary runway being extended to a length of 5,500 feet.

Figure 8-2 - Percent of Airports by Role that Meet Runway Length Objectives



Primary Runway Width Objectives

Runway width is another important component of each airport's airfield system. Objectives for runway width were determined based on the airport's ARC and FAA design standards. Table 8-3 shows each airport's ability to meet its primary runway width objective. As shown in Figure 8-3, 77 percent of system airports meet the runway width objectives for their respective roles. Gardner Municipal Airport is in the middle of a major planning project. It is possible that the recommendations from this local planning effort could result in additional and/or different improvements needed than those identified in this regional system plan.

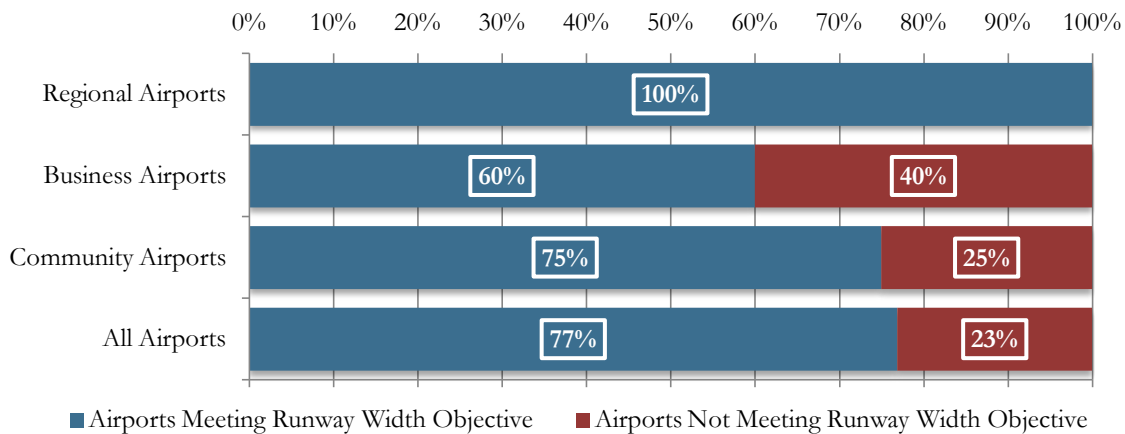
Table 8-3- Runway Width Objectives and Compliance by Airport

Airport	Primary Runway Width (ft)	Meets Objective
Regional Airports: 75' - 100'		
Charles B. Wheeler Downtown	150	Yes
Lee's Summit Municipal*	75	Yes
Midwest National Air Center	100	Yes
New Century Air Center	150	Yes
Business Airports: 75'		
East Kansas City	44	No
Excelsior Springs Memorial	47	No
Johnson County Executive	75	Yes
Sherman Army Airfield	102	Yes
Lawrence Smith Memorial	75	Yes
Community Airports: Kansas - 60' Missouri - Maintain Existing		
Gardner Municipal (KS)	39	No
Miami County (KS)	60	Yes
Noah's Ark (MO)	30	Yes
Roosterville (MO)	20	Yes

Source: Airport Inventory and Data Survey 2015, Airport Records

Note: *Lee's Summit Municipal is in the midst of a long-term development plan that will result in its primary runway being widened to 100 feet.

Figure 8-3 - Percent of Airports by Role that Meet Runway Width Objectives



Taxiway Objectives

Taxiways are constructed to facilitate aircraft movement to and from the runway system and to improve operating safety. Strategically placed taxiway exits permit aircraft to clear the runway after landing and significantly increase runway capacity. Some taxiways are simply necessary to provide access between an apron area and the runway, and others are needed as activity increases and more efficient use of the airfield is required.

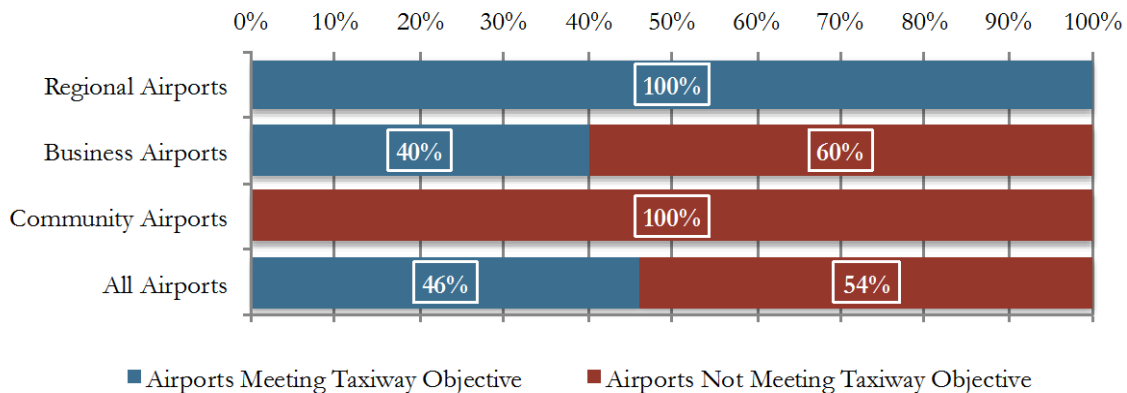
An analysis of each airport’s ability to meet this plan’s taxiway objectives is presented in Table 8-4. Figure 8-4 shows that 46 percent of all airports currently meet the taxiway objectives.

Table 8-4- Taxiway Objectives and Compliance by Airport

Airport	Current Taxiway Type	Meets Objective
Regional Airports: Full Parallel		
Charles B. Wheeler Downtown	Full Parallel	Yes
Lee's Summit Municipal	Full Parallel	Yes
Midwest National Air Center	Full Parallel	Yes
New Century Air Center	Full Parallel	Yes
Business Airports: Partial Parallel/Full Parallel when Justified		
East Kansas City	Partial Parallel	Yes
Excelsior Springs Memorial	Stub	No
Johnson County Executive	Full Parallel	Yes
Sherman Army Airfield	None	No
Lawrence Smith Memorial	Turnaround	No
Community Airports: - Turnarounds on Each Runway End		
Gardner Municipal (KS)	None	No
Miami County (KS)	Stub	No
Noah's Ark (MO)	None	No
Roosterville (MO)	Stub	No

Source: Airport Inventory and Data Survey 2015, Airport Records

Figure 8-4 - Percent of Airports by Role that Meet Taxiway Objectives



Primary Runway Pavement Condition Index (PCI) Objective

The development and maintenance of paved surfaces at system airports requires significant and continual investment. MoDOT and KDOT each have Pavement Management Systems in place for publicly-owned general aviation airports in their states. The objective for the pavement condition for primary runways in this regional system plan is for all airports to maintain a pavement condition index (PCI) of 70 or greater. A PCI of 70 or greater generally indicates that the runway pavement is in good condition. Although PCI data is not available for the five privately-owned airports (East Kansas City, Excelsior Springs Memorial, Sherman Army Airfield, Noah’s Ark and Roosterville), general pavement condition of the primary runways were reported as part of this study’s inventory and are noted in the following table.

Table 8-5 provides PCI for primary runways based on data from each study airport’s respective state Pavement Management System. PCI data is not available for three, or 23 percent, of the 13 study airports. Figure 8-5 shows that 62 percent of all airports have a PCI of 70 or greater on their primary runway. Of the publicly-owned airports in the regional system plan, only Lee’s Summit Municipal and Lawrence Smith Memorial are not compliant with this objective. It is important to note, however, that Lee’s Summit is in the midst of implementing a plan to improve its runway; and it is anticipated that when this project is completed, the pavement condition rating for the airport’s primary runway will meet the PCI objective. As of November 2015, Lawrence Smith Memorial had received bids to conduct pavement maintenance, that, when completed, will be in excellent condition. In addition, three of the privately-owned airports should consider pavement improvements based on the pavement condition reported during this inventory effort.

Table 8-5 - PCI Objectives for Primary Runway PCI and Compliance by Airport

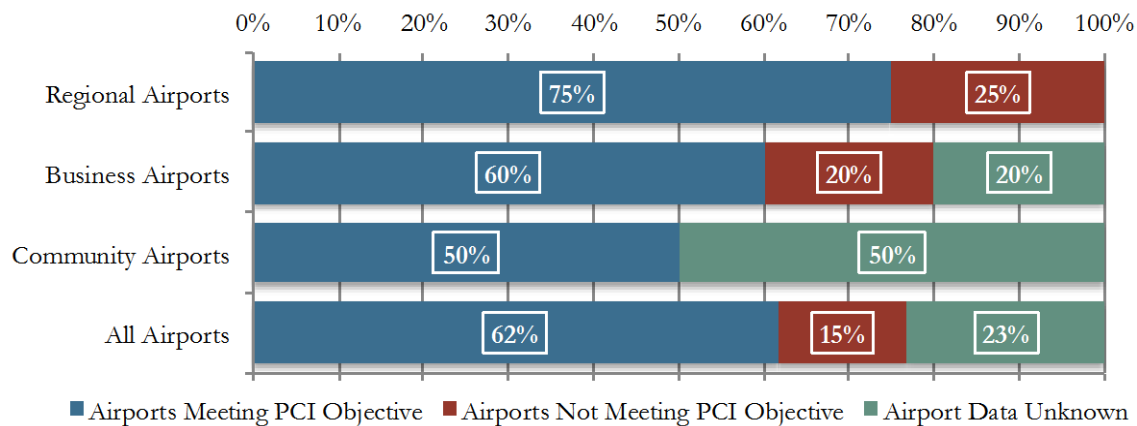
Airport	Primary Runway PCI	Meets Objective
Regional Airports: 70 or Greater		
Charles B. Wheeler Downtown	93	Yes
Lee's Summit Municipal*	67	No
Midwest National Air Center	70	Yes
New Century Air Center	76	Yes
Business Airports: 70 or Greater		
East Kansas City	Unknown PCI/ Good Condition	PCI Unknown
Excelsior Springs Memorial	100	Yes
Johnson County Executive	83	Yes
Lawrence Smith Memorial**	42	No
Sherman Army Airfield	100	Yes
Community Airports: 70 or Greater		
Gardner Municipal (KS)	92	Yes
Miami County (KS)	100	Yes
Noah's Ark (MO)	Unknown PCI/ Good Condition	PCI Unknown
Roosterville (MO)	Unknown PCI/ Good Condition	PCI Unknown

Source: Airport Inventory and Data Survey 2015, Airport Records

Note: *Lee's Summit Municipal is in the midst of a long-term development plan that will result in its primary runway being reconstructed. When the project is complete its PCI will meet the objective.

**Lawrence Smith Memorial has received bids for a runway repair project that will be complete in Spring 2016. When the project is complete its PCI will meet the objective.

Figure 8-5 - Percent of Airports by Role that Meet Primary Runway PCI Objectives



Visual Navigational Aids (NAVAIDS) Objectives

Various visual aids provide navigational assistance to aircraft arriving and departing system airports. Three common NAVAIDS include rotating beacons, wind cones or wind socks, and segmented circles. Further, visual aids provide support to instrument approaches and include Visual Glide Slope Indicators (VGSIs); such as a Precision Approach Path Indicators (PAPIs) or Visual Approach Slope Indicators (VASIs); and Runway End Identifier Lights (REILs). PAPIs and VASIs are lighting systems located adjacent to the runway to assist aircraft with visually based vertical alignment on approach to landing. REILs are installed to provide rapid and positive identification of the runway end.

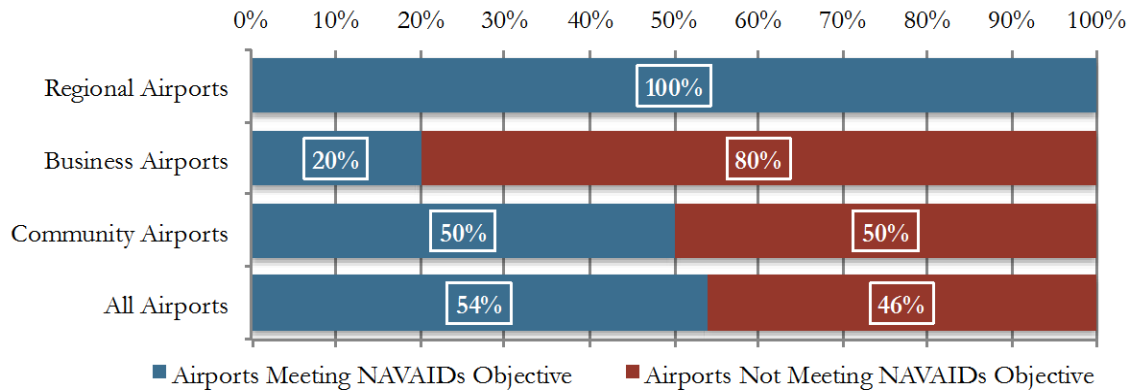
Table 8-6 shows which airports currently meet their system plan objectives for visual NAVAIDS. If an airport does not meet all of the four visual NAVAIDS objectives, it is categorized as not meeting this particular objective. As shown in Figure 8-6, 54 percent of system airports currently meet all visual NAVAIDS objectives.

Table 8-6 - NAVAIDS Objectives and Compliance by Airport

Airport	Rotating Beacon	Lighted Wind Cone/ Segmented Circle	REILs	VGSI	Meets Objective
Regional Airports: Rotating Beacon, Lighted Wind Cone/Segmented Circle, REILs, VGSI (VASIs/PAPIs)					
Charles B. Wheeler Downtown	Yes	Yes	Yes/No	V4L/P4L	Yes
Lee's Summit Municipal	Yes	Yes	Yes/Yes	V4L/V4L	Yes
Midwest National Air Center	Yes	Yes	Yes/Yes	P4L/P4L	Yes
New Century Air Center	Yes	Yes	Yes/No	V4L/No	Yes
Business Airports: Rotating Beacon, Lighted Wind Cone/Segmented Circle, REILs, VGSI (VASIs/PAPIs)					
East Kansas City	Yes	Yes	Yes/No	V4L/V4L	No
Excelsior Springs Memorial	Yes	Yes	No/No	No/No	No
Johnson County Executive	Yes	Yes	No/No	V2L/V4L	No
Lawrence Smith Memorial	Yes	Yes	No/No	P4L/P4L	No
Sherman Army Airfield	Yes	Yes	Yes/Yes	P4L/P4L	Yes
Community Airports: Kansas-Wind Sock Missouri-Lighted Wind Cone/Segmented Circle, Rotating Beacon Desired					
Gardner Municipal (KS)	Yes	Yes	No/No	No/No	Yes
Miami County (KS)	Yes	Yes	Yes/Yes	P4L/P4L	Yes
Noah's Ark (MO)	No	No	No/No	No/No	No
Roosterville (MO)	No	No	No/No	No/No	No

Source: Airport Inventory and Data Survey 2015, Airport Records

Figure 8-6 - Percent of Airports by Role that Meet All NAVAIDS Objectives



Runway Approach Objectives

Runway approach technology has significantly evolved in the last decade and continues to evolve with the development and rollout of FAA’s Next Generation Air Transportation System (NextGen). The majority of new approach procedures developed by the FAA are now satellite-based. Current approach technology relies on Global Positioning Systems (GPS), Localizer Performance with Vertical Guidance (LPV) or Lateral Navigation (LNAV). Historically, approaches were ground-based using Instrument Landing Systems (ILS) and Very High Frequency Omni-Directional Range (VOR). Recognizing the changes in approach technology, this objective for the regional system plan reflects current technology and is consistent with FAA AC 150/5300-13A, Change 1, *Airport Design*, regarding planning visibility minimums for instrument procedures.

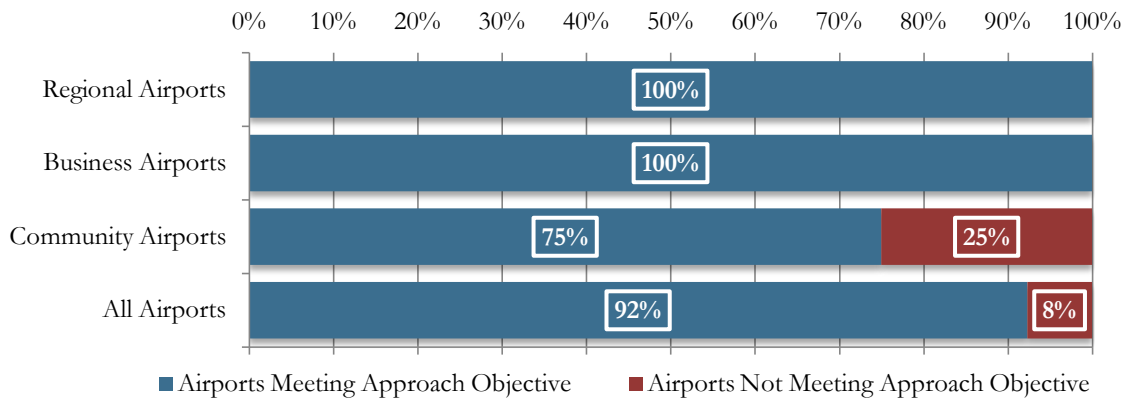
Table 8-7 lists the best existing approach type and minimums at each study airport. As shown in Figure 8-7, 92 percent of airports currently meet their approach objective.

Table 8-7 - Approach Objectives for Approach and Compliance by Airport

Airport	Existing Approach	Lowest Existing Minimums (Decision Altitude - DA) + Visibility	Height Above Touchdown (HAT)	Visibility (miles)	Meets Objective
Regional Airports: Instrument Approach with Vertical Guidance (APV)					
Charles B. Wheeler Downtown	ILS	994-3/4	300	3/4	Yes
Lee's Summit Municipal	LPV	1248-1	300	1	Yes
Midwest National Air Center	ILS	977-3/4	200	3/4	Yes
New Century Air Center	ILS	1267-1/2	200	1/2	Yes
Business Airports: Non-Precision Approach (NPA), LPV desired					
East Kansas City	LNAV	1360-1	600	1	Yes
Excelsior Springs Memorial	VOR or GPS	1620-1	700	1	Yes
Johnson County Executive	LPV	1336-1	300	3/4	Yes
Lawrence Smith Memorial	LPV	1176-1	300	1	Yes
Sherman Army Airfield	LNAV	1520-1	800	1	Yes
Community Airports: Kansas- Non-Precision Approach (NPA), LPV desired Missouri-Visual					
Gardner Municipal (KS)	Visual				No
Miami County (KS)	LPV	1284-1	400	1	Yes
Noah's Ark (MO)	Visual				Yes
Roosterville (MO)	Visual				Yes

Source: FAA Digital Terminal Procedures, July 23-August 19, 2015

Figure 8-7 - Percent of Airports by Role that Meet Approach Objectives



Lighting Objectives

Runway, taxiway, and approach lighting provide assistance to aircraft arriving and departing airports at night and during periods of reduced visibility. Further, lighting systems provide support to the approach objectives discussed in the previous section. Runway and taxiway lighting are classified according to their degree of intensity or brightness. There are three specific classifications of runway and taxiway lighting: High Intensity (HIRL and HITL), Medium Intensity (MIRL and MITL) or Low Intensity (LIRL and LITL). Approach lighting systems (ALS) provide a visual light path for landing aircraft at airports with an instrument approach procedure. Approach lighting systems include Medium Intensity Approach Lighting Systems (MALSR or MALSF). It is important to note that Midwest National Air Center has evaluated installing an ALS system; but due to terrain constraints and a nearby railroad, they have determined the project is not feasible.

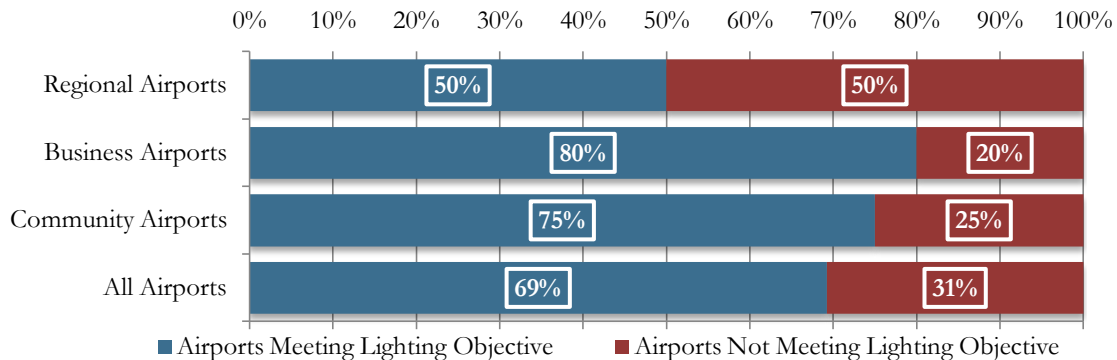
Table 8-8 indicates which airports currently meet the regional system plan objectives for lighting. Figure 8-8 shows that 69 percent of all study airports currently meet the lighting objectives for their specific airport role.

Table 8-8 - Lighting Objectives and Compliance by Airport

Airport	Primary Runway Lighting	Taxiway Lighting	Approach Lighting System	Meets Objective
Regional Airports: MIRL/MITL with ALS; HIRL/HITL desired				
Charles B. Wheeler Downtown	HIRL	HITL	MALSF	Yes
Lee's Summit Municipal	MIRL	MITL	None	No
Midwest National Air Center	HIRL	MITL	None	No
New Century Air Center	HIRL	MITL	MALSR	Yes
Business Airports: MIRL				
East Kansas City	MIRL	None	None	Yes
Excelsior Springs Memorial	NSTD LIRL	None	None	No
Johnson County Executive	MIRL	MITL	MALSR	Yes
Lawrence Smith Memorial	MIRL	None	None	Yes
Sherman Army Airfield	HIRL	None	None	Yes
Community Airports: Kansas – MIRL Missouri - LIRL desired				
Gardner Municipal (KS)	NSTD	None	None	No
Miami County (KS)	MIRL	None	None	Yes
Noah's Ark (MO)	LIRL	None	None	Yes
Roosterville (MO)	NSTD MIRL	None	None	Yes

Source: Airport Inventory and Data Survey 2015, Airport Records

Figure 8-8 - Percent of Airports by Role that Meet Lighting Objectives



Weather Reporting Capability Objectives

On-site weather reporting equipment at an airport complements its approach capabilities and promotes an increased safety margin during periods of inclement or changing weather. By providing on-site weather reporting equipment, AWOS or ASOS, pilots are ensured sufficient information related to weather conditions at their destination airport, as well as at other potential backup airports.

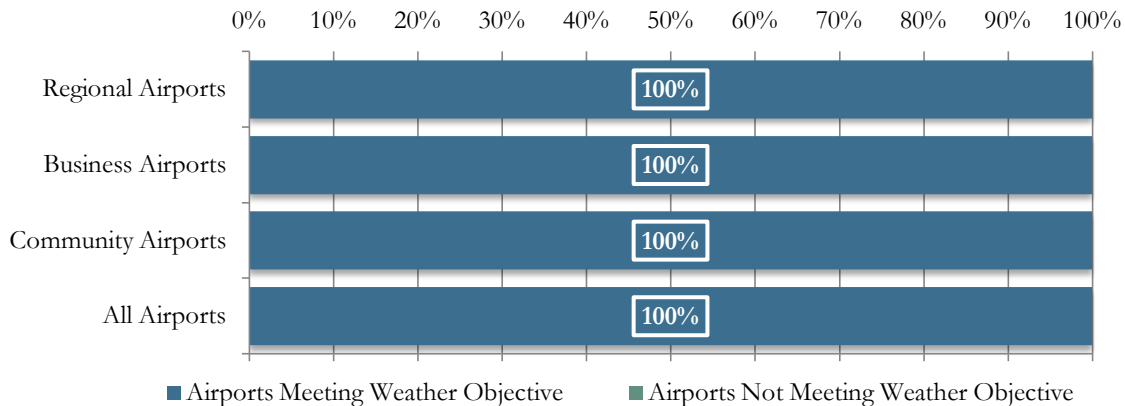
Table 8-9 indicates which airports, by role, are currently meeting the regional system plan objectives and which airports are not. For Business and Community Airports, it is desirable for these airports to have either an AWOS or ASOS, but not necessary. Since this objective is considerable desirable, Business Airports (East Kansas City and Excelsior Springs Memorial) and Community Airports (Gardner Municipal, Miami County, Noah's Ark, and Roosterville) that do not have on-site weather equipment are considered in this analysis to meet their objective. Figure 8-9 shows that all system airports currently meet their weather reporting objective.

Table 8-9 - Weather Reporting Objectives and Compliance by Airport

Airport	Existing Weather Reporting Capability	Meets Objective
Regional Airports: ASOS or AWOS		
Charles B. Wheeler Downtown	ASOS	Yes
Lee's Summit Municipal	ASOS	Yes
Midwest National Air Center	AWOS-III	Yes
New Century Air Center	ASOS	Yes
Business Airports: ASOS or AWOS Desired		
East Kansas City	None	Yes
Excelsior Springs Memorial	None	Yes
Johnson County Executive	ASOS	Yes
Lawrence Smith Memorial	AWOS-III	Yes
Sherman Army Airfield	AWOS	Yes
Community Airports: Kansas - ASOS or AWOS Desired Missouri - None		
Gardner Municipal (KS)	None	Yes
Miami County (KS)	None	Yes
Noah's Ark (MO)	None	Yes
Roosterville (MO)	None	Yes

Source: Airport Inventory and Data Survey 2015, Airport Records

Figure 8-9 - Percent of Airports by Role that Meet Weather Reporting Objectives



Hangar Storage Objectives

Demand for hangar space is directly related to the local climate and the type of aircraft based at each airport. Areas with severe weather conditions have a higher demand for hangar storage facilities. In addition, higher cost jet and turboprop aircraft can increase the demand for hangar storage.

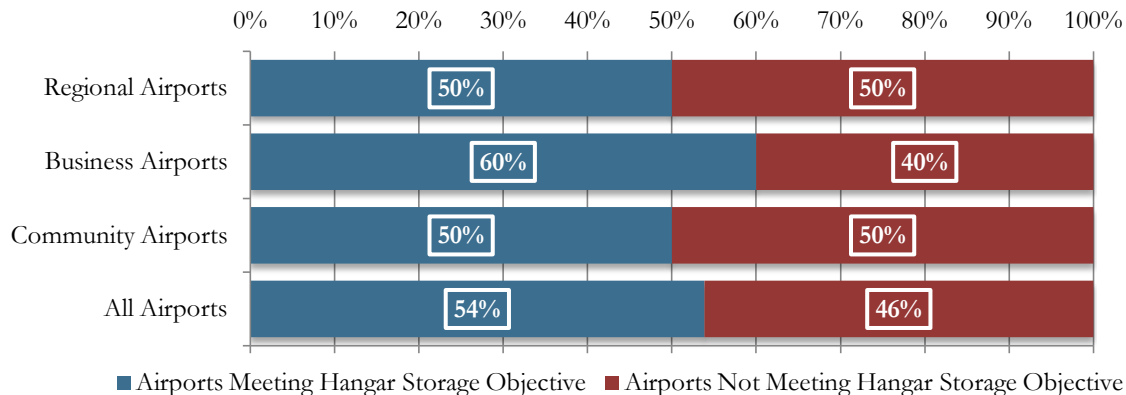
The hangar storage objective used in this plan is for study airports is to provide hangar spaces equal to the number of based aircraft projected for the airport in 2035 as presented in Chapter 3: Outlook for Future Demand. For two Community Airports, Noah’s Ark and Roosterville, the objective is to maintain existing hangar storage. This objective was adopted from the Missouri State Aviation System Plan. Current and projected hangar needs for each airport are presented in Table 8-10. Figure 8-10 shows that only 54 percent of system airports meet their hangar storage objective.

Table 8-10 - Hangar Storage Objectives and Compliance by Airport

Airport	Existing Number of Hangar Spaces	Hangar Spaces Needed in 2035	Meets Objective
Regional Airports: 100% of Based Aircraft			
Charles B. Wheeler Downtown	226	264	No
Lee's Summit Municipal	177	170	Yes
Midwest National Air Center	84	75	Yes
New Century Air Center	99	104	No
Business Airports: 100% of Based Aircraft			
East Kansas City	201	224	No
Excelsior Springs Memorial	28	20	Yes
Johnson County Executive	194	126	Yes
Lawrence Smith Memorial	51	37	Yes
Sherman Army Airfield	23	28	No
Community Airports: Kansas - 100% of Based Aircraft Missouri - Maintain Existing			
Gardner Municipal (KS)	99	115	No
Miami County (KS)	24	27	No
Noah's Ark (MO)	45	47	Yes
Roosterville (MO)	68	74	Yes

Source: Airport Inventory and Data Survey 2015, Airport Records

Figure 8-10 - Percent of Airports by Role that Meet Hangar Storage Objectives



Aircraft Apron Objectives

Aircraft aprons are designated surfaces typically adjacent to terminal buildings and maintenance hangars that provide areas for parking aircraft, loading and unloading, fueling, and servicing aircraft. Apron areas can vary in size and location based on the level and nature of demand, type and size of aircraft intended to use the parking area, FAA design standards, and aircraft maneuvering needs.

The objective for apron parking for the study airports (excluding two Community airports: Noah’s Ark and Roosterville) is to accommodate 20 percent of busy-day transient aircraft with tie-down spaces on an apron area. For Noah’s Ark and Roosterville, the objective is to maintain their existing apron area. This objective was adopted from the Missouri State Aviation System Plan. The following assumptions were used to determine busy-day transient aircraft apron space needs:

- Transient (itinerant) operations were taken from the activity forecasts prepared as part of the regional system plan (Chapter 3: Outlook for Future Demand).
- Annual transient operations for each system airport were divided by 10 to derive a proxy number for busy-month operations. The result was then divided by 30 to derive average-day aircraft operations. To estimate busy-day operations, it was assumed that the busy day is 15 percent more active than an average day.

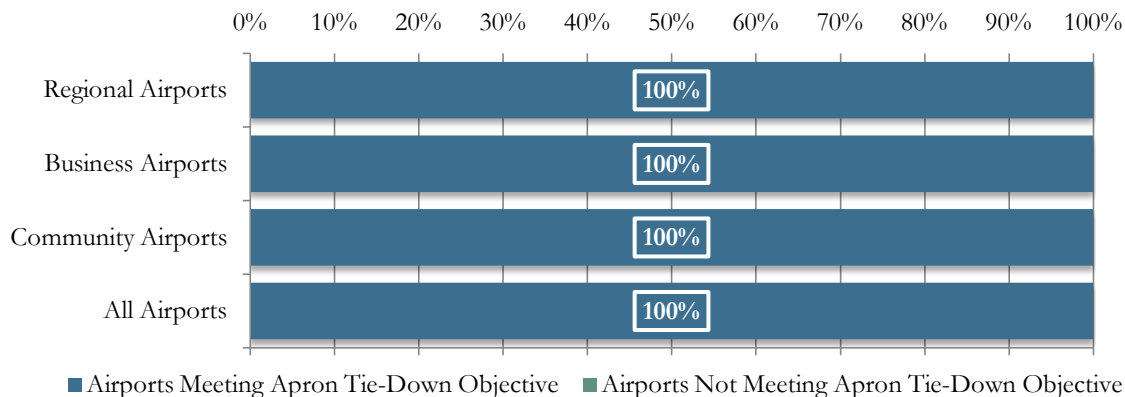
An analysis of apron area objectives for each airport is presented in Table 8-11, and Figure 8-11 shows that 100 percent of system airports now meet their aircraft apron objectives.

Table 8-11 - Apron Storage Objectives and Compliance by Airport

Airport	Existing Number of Apron Tie-Down Spaces	Apron Tie-Down Spaces Needed in 2035	Meets Objective
Regional Airports: 20% of Busy Day Transient			
Charles B. Wheeler Downtown	50	20	Yes
Lee's Summit Municipal	60	8	Yes
Midwest National Air Center	14	2	Yes
New Century Air Center	67	11	Yes
Business Airports: 20% of Busy Day Transient			
East Kansas City	28	2	Yes
Excelsior Springs Memorial	10	1	Yes
Johnson County Executive	102	15	Yes
Lawrence Smith Memorial	15	1	Yes
Sherman Army Airfield	6	5	Yes
Community Airports: Kansas - 20% of Busy Day Transient Missouri - Maintain Existing			
Gardner Municipal (KS)	15	5	Yes
Miami County (KS)	17	2	Yes
Noah's Ark (MO)	0	0	Yes
Roosterville (MO)	12	12	Yes

Source: Airport Inventory and Data Survey 2015, Airport Records

Figure 8-11 - Percent of Airports by Role that Meet Apron Storage Objectives



Terminal/Administration Building Objectives

General aviation terminal/administration buildings provide essential services for passengers and pilots, as well as a facility for the transfer of passengers and flight crews to and from their aircraft. Buildings can range from a small pilot room for flight planning and resting to a large multi-room building that provides services for a variety of uses. For some communities, the general aviation terminal building provides the first impression of a community to visitors, so the terminal building should be welcoming and provide a positive experience for the visitor. Specific areas or amenities in a terminal building can include restrooms, pilots' lounge, offices, and conference rooms.

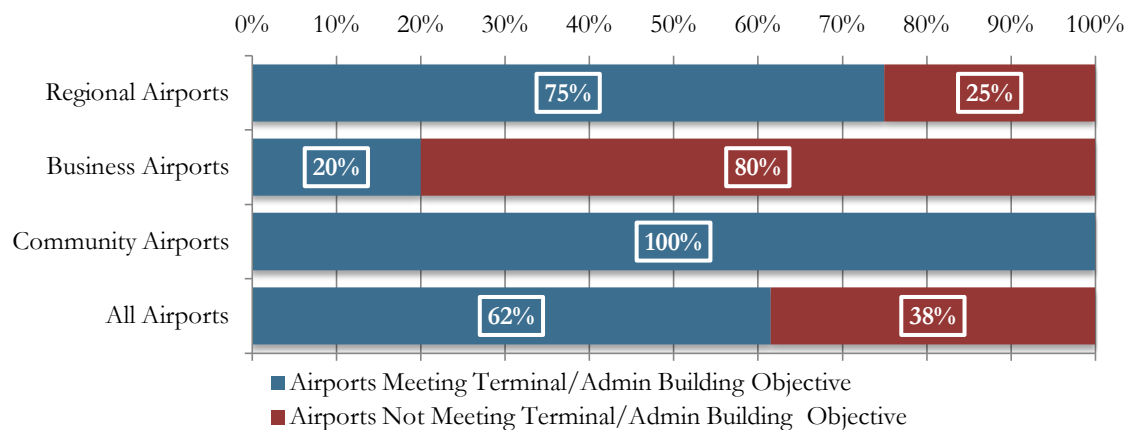
An analysis of general aviation terminal building objectives for each airport is presented in Table 8-12 and is based on inventory data that was collected from each airport as part of the regional system plan. As shown in Figure 8-12, 62 percent of system airports now meet their terminal/administration building objectives.

Table 8-12 - Terminal/Admin Building Objectives and Compliance by Airport

Airport	Existing Terminal/Admin Building Square Footage	Terminal Amenities			Meets Objective
		Restrooms	Conference Room	Pilots' Lounge	
Regional Airports: 2,500 sq ft w/Restrooms, Conference Room, and Pilots' Lounge					
Charles B. Wheeler Downtown	26,500	Yes	Yes	Yes	Yes
Lee's Summit Municipal	1,800	Yes	Yes	Yes	No
Midwest National Air Center	3,220	Yes	Yes	Yes	Yes
New Century Air Center	5,600	Yes	Yes	Yes	Yes
Business Airports: 1,500 sq ft w/Restrooms, Conference Room, and Pilots' Lounge					
East Kansas City	1,000	Yes	Yes	Yes	No
Excelsior Springs Memorial	1,500	Yes	No	Yes	No
Johnson County Executive	6,000	Yes	Yes	Yes	Yes
Lawrence Smith Memorial	940	Yes	No	Yes	No
Sherman Army Airfield	1,200	Yes	Yes	Yes	No
Community Airports: Kansas — Pilots' Lounge and Restrooms Missouri-Maintain Existing					
Gardner Municipal (KS)	400	Yes	Yes	Yes	Yes
Miami County (KS)	1,300	Yes	No	Yes	Yes
Noah's Ark (MO)	600	Yes	No	Yes	Yes
Roosterville (MO)	1,500	Yes	Yes	Yes	Yes

Source: Airport Inventory and Data Survey 2015, Airport Records

Figure 8-12 - Percent of Airports by Role that Meet Terminal/Admin Building Objectives



Auto Parking Objectives

Adequate auto parking is important to ensuring employees, pilots, aircraft owners and visitors are sufficiently served. The number of auto parking spaces at an airport varies based on airport demand levels and airport services. The regional system plan’s objective for study airports (excluding Noah’s Ark and Roosterville) is to provide 1.5 spaces per aircraft departure on an average day in the peak month. For two Community Airports, Noah’s Ark and Roosterville, their objective is to maintain existing auto parking. This objective was adopted from Missouri’s system plan.

The number of auto parking spaces needed was determined by taking the forecast of total annual general aviation operations, developed in Chapter 3, and dividing by half to determine the number of landings and takeoffs. Annual aircraft takeoffs were then divided by 12 to determine the average month, and it was assumed that the peak month is 10 percent busier than the average month. To determine the average day within the peak month, peak month operations were divided by 30.

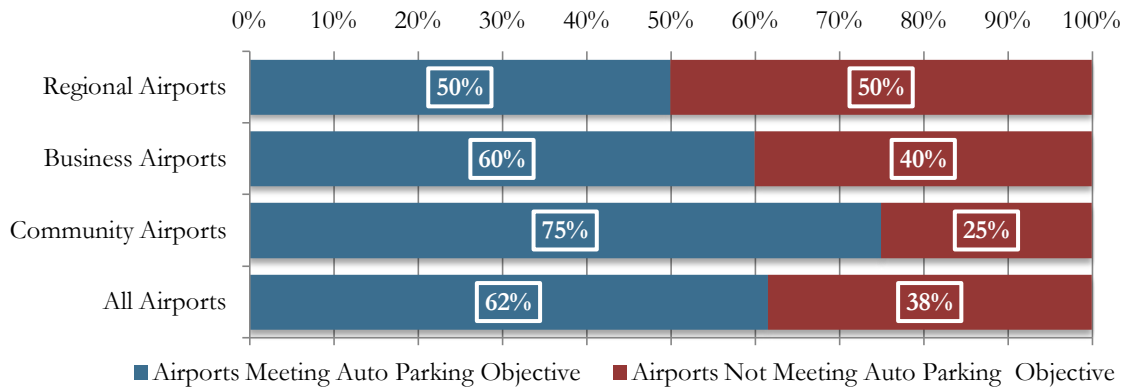
An analysis of auto parking needs and compliance for each airport with its auto parking objective is presented in Table 8-13. Figure 8-13 shows that 62 percent of the study airports now meet their respective auto parking objective.

Table 8-13 - Auto Parking Objectives and Compliance by Airport

Airport	Existing Number of Auto Parking Spaces	Auto Parking Spaces Needed in 2035	Meets Objective
Regional Airports: 1.5 Spaces per Aircraft Departure on Average Day in Peak Month			
Charles B. Wheeler Downtown	1,520	214	Yes
Lee's Summit Municipal	53	154	No
Midwest National Air Center	87	37	Yes
New Century Air Center	120	134	No
Business Airports: 1.5 Spaces per Aircraft Departure on Average Day in Peak Month			
East Kansas City	10	37	No
Excelsior Springs Memorial	18	12	Yes
Johnson County Executive	230	151	Yes
Lawrence Smith Memorial	35	22	Yes
Sherman Army Airfield	20	60	No
Community Airports: Kansas - 1.5 Spaces per Aircraft Departure on Average Day in Peak Month Missouri - Maintain Existing			
Gardner Municipal (KS)	118	79	Yes
Miami County (KS)	17	31	No
Noah's Ark (MO)	20	15	Yes
Roosterville (MO)	25	7	Yes

Source: Airport Inventory and Data Survey 2015, Airport Records

Figure 8-13 - Percent of Airports by Role that Meet Auto Parking Objectives



Ground Communication Objectives

Traffic activity and availability of services at an airport usually dictate the type of ground communications that are available. An air traffic control tower (ATCT) provides direct clearance for pilots and offers the highest assurance of safe operations. A Remote Communications Outlet (RCO) is an unmanned communications facility remotely controlled by air traffic personnel to extend the communication range of the air control traffic facility. RCOs are important for airports because they provide pilots with en-route clearances, issue departure authorizations, acknowledge instrument flight rule cancellations, or indicate departure/landing times.

A Ground Communications Outlet (GCO) meets the same objective by relaying such communications between pilot radios and air traffic control or flight service station personnel via a dedicated telephone connection. With continual technology changes and communications advancements, the need for an RCO or GCO may become obsolete. However, for this regional system plan, the communications objectives continue to mirror the current state airport system plan objectives for both Kansas and Missouri. A public phone and Wi-Fi access allow pilots and passengers to communicate with non-aviation outlets while on the ground.

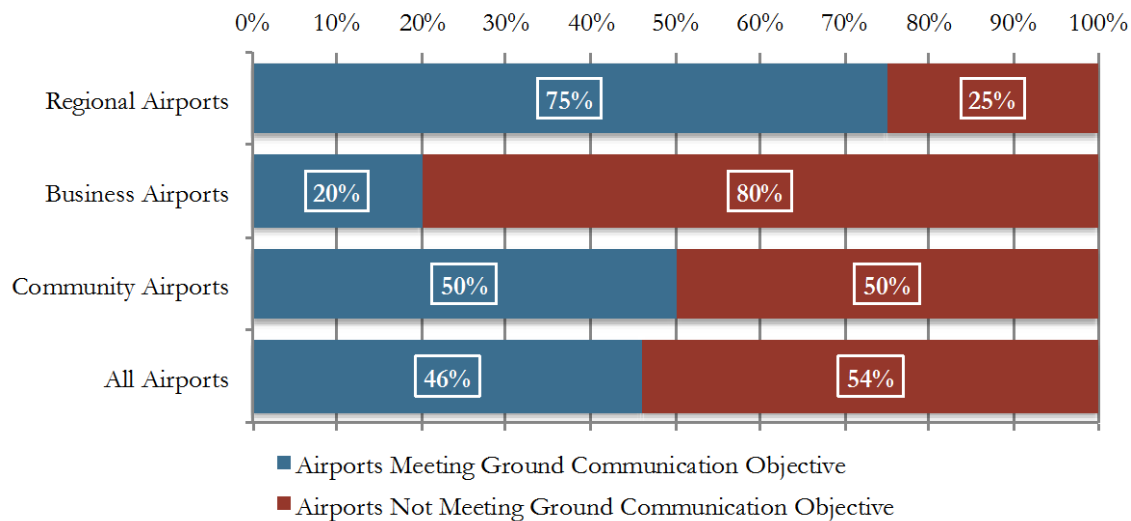
An analysis of the ground communication objectives for each airport is presented in Table 8-14, and Figure 8-14 illustrates that 46 percent of all study airports now meet their ground communications objective.

Table 8-14 - Ground Communication Objectives and Compliance by Airport

Airport	Existing Ground Communication					Meets Objective
	Public Phone	WiFi	GCO	RCO	ATCT	
Regional Airports: Public Phone, WiFi and GCO/RCO or ATCT						
Charles B. Wheeler Downtown	Yes	Yes	No	Yes	Yes	Yes
Lee's Summit Municipal	Yes	Yes	No	Yes	No	Yes
Midwest National Air Center	Yes	Yes	No	No	No	No
New Century Air Center	Yes	Yes	No	No	Yes	Yes
Business Airports: Public Phone, WiFi and GCO/RCO or ATCT						
East Kansas City	Yes	Yes	No	No	No	No
Excelsior Springs Memorial	Yes	No	No	No	No	No
Johnson County Executive	Yes	Yes	No	Yes	Yes	Yes
Lawrence Smith Memorial	Yes	Yes	No	No	No	No
Sherman Army Airfield	Yes	Yes	No	No	No	No
Community Airports: Kansas - Public Phone, WiFi Missouri - Public Phone, WiFi, GCO as needed						
Gardner Municipal (KS)	Yes	Yes	No	No	No	Yes
Miami County (KS)	Yes	No	No	No	No	No
Noah's Ark (MO)	Yes	Yes	No	No	No	Yes
Roosterville (MO)	Yes	Yes	No	No	No	Yes

Source: Airport Inventory and Data Survey 2015, Airport Records

Figure 8-14 - Percent of Airports by Role that Meet Ground Communication Objectives



Service Objectives

The availability of services contributes to the attractiveness and utility of an airport. The plan's service objectives are developed for fuel, fixed based operator (FBO), aircraft maintenance, and ground transportation services/rental car.

A summary of the type of FBO services at each study airport are detailed in Table 8-15. An airport meets the service objective if it has all of the services in place as recommended for its respective role. Figure 8-15 shows that 77 percent of the all study airports meet their respective objectives for services offered.

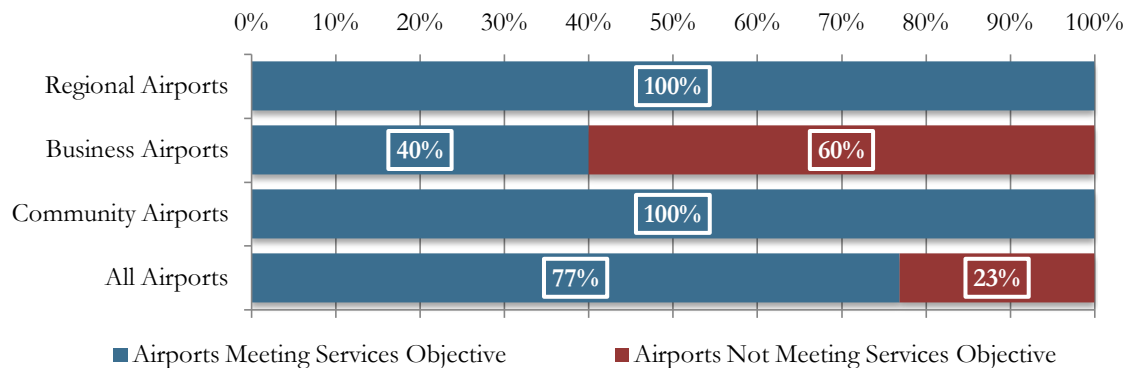
Table 8-15 - Service Objectives and Compliance by Airport

Airport	Existing Services			Meets Objective	
	Fuel Type	FBO	Maintenance Rental Cars		
Regional Airports: Fuel-AvGas and Jet A; FBO-Full Service; Maintenance-Full Service; Rental Cars-Available					
Charles B. Wheeler Downtown	AvGas and Jet A	Full Service	Full Service	Yes	Yes
Lee's Summit Municipal	AvGas and Jet A	Full Service	Full Service	Yes	Yes
Midwest National Air Center	AvGas and Jet A	Full Service	Full Service	Yes	Yes
New Century Air Center	AvGas and Jet A	Full Service	Full Service	Yes	Yes
Business Airports: Fuel-AvGas and Jet A; FBO-Full Service; Rental Cars-Available					
East Kansas City	AvGas and Jet A	Full Service	Full Service	Yes	Yes
Excelsior Springs Memorial	AvGas	None	None	No	No
Johnson County Executive	AvGas and Jet A	Full Service	Full Service	Yes	Yes
Lawrence Smith Memorial	AvGas	Limited Service	Limited Service	Yes	No
Sherman Army Airfield	AvGas and Jet A	Full Service	Full Service	No	No
Community Airports: Kansas - Link to Ground Transportation Missouri - AvGas and Jet A as needed, FBO-Limited Service					
Gardner Municipal (KS)	AvGas	None	None	Yes*	Yes
Miami County (KS)	AvGas	Limited Service	None	Yes*	Yes
Noah's Ark (MO)	AvGas	Limited Service	None	No	Yes
Roosterville (MO)	AvGas	Full Service	Full Service	No	Yes

Source: Airport Inventory and Data Survey 2015, Airport Records

*2009 KASP identified a link to ground transportation.

Figure 8-15 - Percent of Airports by Role that Meet Service Objectives



Summary of Facility and Service Objectives

This chapter evaluated the ability of each airport to meet the minimum facility and service objectives. A summary of the projects by airport that are needed to meet the objectives established for their respective roles are summarized in Table 8-16. Facility and service deficiencies identified in this analysis do not necessarily indicate that an airport should or must meet that objective during or beyond the planning period. In order for projects to receive federal or state funding, they must be justified and identified on an airport's Airport Layout Plan (ALP) and appropriate environmental analysis must be completed.

Two system airports have physical constraints that would make it extremely difficult to meet many of their facility and service objectives. East Kansas City is landlocked by I-70 to the north and west and residential development to the south and east. Excelsior Springs Memorial is also physically constrained by a state highway off the north end of the runway and a golf course and road off the south end of the runway.

It is also important to reiterate that as of January 2016, Gardner Municipal Airport is in the middle of a major planning project that seeks to address compliance concerns, as well as to evaluate its runway system. This planning effort is not complete. It is possible that the recommendations from the airport's planning effort could result in additional and/or different improvements needed than what have been identified in this regional system plan.

Information from this chapter coupled with the future system analysis in the previous chapter provides a basis for recommendations for the airport system that will help to achieve a balanced, viable, effective, and efficient system of general aviation airports for the Kansas City Metropolitan area.

Table 8-16 - Summary of Airport Needs to Meet Facility and Service Objectives

Facility/Service Category	Regional Airport Needs	Business Airport Needs	Community Airport Needs
ARC		<ul style="list-style-type: none"> ➤ East Kansas City: meet B-II design standards ➤ Excelsior Springs Memorial: meet B-II design standards 	
Runway Length	<ul style="list-style-type: none"> ➤ Lee's Summit Municipal: extend runway 984' (project underway) to 5,000' 	<ul style="list-style-type: none"> ➤ Excelsior Springs Memorial: extend runway 2,000' to 4,000' 	<ul style="list-style-type: none"> ➤ Gardner Municipal: extend runway 240' to 3,200'
Runway Width		<ul style="list-style-type: none"> ➤ East Kansas City: widen runway 31' to 75' ➤ Excelsior Springs Memorial: widen runway 28' to 75' 	<ul style="list-style-type: none"> ➤ Gardner Municipal: widen runway 21' to 60'
Taxiway		<ul style="list-style-type: none"> • Excelsior Springs Memorial: add partial or full parallel taxiway • Lawrence Smith Memorial: add partial or full parallel taxiway 	<ul style="list-style-type: none"> • Gardner Municipal: add turnarounds • Miami County: add turnarounds (airport is planning full parallel taxiway) • Noah's Ark: add turnarounds

Table 8-16 - Summary of Airport Needs to Meet Facility and Service Objectives

Facility/Service Category	Regional Airport Needs	Business Airport Needs	Community Airport Needs
		<ul style="list-style-type: none"> • Sherman Army Airfield: add partial or full parallel taxiway 	<ul style="list-style-type: none"> • Roosterville: add turnarounds
Primary Runway PCI	<ul style="list-style-type: none"> ➤ Lee's Summit Municipal: conduct pavement maintenance (will be complete in conjunction runway extension) 	<ul style="list-style-type: none"> ➤ East Kansas City: conduct pavement maintenance ➤ Lawrence Smith Memorial: conduct pavement maintenance (will be complete by end of 2014) 	<ul style="list-style-type: none"> ➤ Noah's Ark: conduct pavement maintenance ➤ Roosterville: conduct pavement maintenance
Navigational Aids		<ul style="list-style-type: none"> ➤ East Kansas City: add REILs on RW27 ➤ Excelsior Springs Memorial: add REILs and VGSI to both RW ends ➤ Johnson County Executive: add REIL on RW18 ➤ Lawrence Smith Memorial: add REILs both RW ends 	<ul style="list-style-type: none"> ➤ Noah's Ark: add lighted wind cone/segmented circle ➤ Roosterville: add lighted wind cone/segmented circle
Approach Type			<ul style="list-style-type: none"> ➤ Gardner Municipal: add non-precision approach (LPV desired)
Lighting	<ul style="list-style-type: none"> ➤ Lee's Summit Municipal: add ALS 	<ul style="list-style-type: none"> ➤ Excelsior Springs Memorial: add MIRL 	<ul style="list-style-type: none"> ➤ Gardner Municipal: add MIRL
Weather			
Hangar Storage	<ul style="list-style-type: none"> ➤ Charles B. Wheeler Downtown: add 38 hangar spaces ➤ New Century Air Center: add 5 hangar spaces 	<ul style="list-style-type: none"> ➤ East Kansas City: add 23 hangar spaces ➤ Sherman Army Airfield: add 5 hangar spaces 	<ul style="list-style-type: none"> ➤ Gardner Municipal: add 16 hangar spaces ➤ Miami County: add 3 hangar spaces
Apron Tie-Downs			
Terminal/Admin Building	<ul style="list-style-type: none"> ➤ Lee's Summit Municipal: add 600 sq. ft. terminal space 	<ul style="list-style-type: none"> ➤ East Kansas City: add 500 sq. ft. terminal space ➤ Excelsior Springs add conference room ➤ Lawrence Smith Memorial: add 560 sq. ft. terminal space and 	

Table 8-16 - Summary of Airport Needs to Meet Facility and Service Objectives

Facility/Service Category	Regional Airport Needs	Business Airport Needs	Community Airport Needs
		conference room ➤ Sherman Army Airfield: add 300 sq. ft. terminal space	
Auto Parking	➤ Lee's Summit Municipal: add 101 auto parking spaces ➤ New Century Air Center: add 14 auto parking spaces	➤ East Kansas City: add 27 auto parking spaces ➤ Sherman Army Airfield: add 40 auto parking spaces	➤ Miami County: add 14 auto parking spaces
Ground Communications	➤ Midwest National Air Center: add GCO or RCO	➤ East Kansas City: add GCO or RCO ➤ Excelsior Springs: provide WiFi and add GCO or RCO ➤ Lawrence Smith Memorial: add GCO or RCO ➤ Sherman Army Airfield: add GCO or RCO	➤ Miami County: provide WiFi ➤ Roosterville: provide WiFi
Services		➤ Excelsior Springs: add Jet A fuel, full-service FBO, and provide access to rental cars ➤ Lawrence Smith Memorial: add Jet A fuel and full-service FBO ➤ Sherman Army Airfield: provide access to rental cars	

Chapter Nine: Costs and Implementation

For airports included in the regional system to meet the facility and service objectives and other performance measure objectives outlined in this plan, investment in study airports will be needed. This investment will improve the performance of the regional airport system relative to future targets established through stakeholder input. Stakeholder input was an important component for supporting the study's development.

Development costs presented in this chapter are estimated for each study airport by comparing existing airport facilities to objectives for facilities and services and performance measures identified in the plan. Objectives and performance measures are generally applicable to each airport's role in the regional system. Development costs reported in this chapter include all recommended projects and actions identified in Chapters 7 and 8 of this plan.

It should be noted that the costs presented in this chapter only capture costs that are related to the plan's specific objectives, projects, and actions. These costs do not include projects that may be required to implement recommendations stemming from current airport-specific master plans or CIPs (Capital Improvement Plans). Those costs will continue to be captured through each airport's annual submission of its specific CIP to FAA, MoDOT or KDOT, as applicable to each study airport. It is important, however, on the local level, for each study airport to cross-check its regional system plan recommendations with its local development plans that may already be in place. Based on evaluation in this regional system plan, projects and costs summarized in this chapter are those with the greatest potential to elevate the performance of the regional airport system serving the Kansas City Metropolitan Area.

The system plan is a high-level planning document. Any project identified in this plan would need to be implemented from the bottom up, by the specific airport. As part of the plan, each airport was contacted to discuss its specific recommendations. As part of that process, some airports indicated that their ability to implement the plan's recommendations may be impacted by their limited financial resources or by other limitations. In addition, these calls and other airport input indicate that several airports have on-going initiatives that may result in projects, not identified in the regional system plan, being implemented. It is recognized that projects identified in this plan are not all encompassing and that there will likely be development, maintenance, and rehabilitation needs that are not captured in this plan.

It is important to note that the inclusion of a project in the regional aviation system plan does not constitute a commitment on the behalf of MoDOT, KDOT, or the FAA to fund any of the identified projects. Projects that are eligible for FAA funding may require additional steps before they can be implemented. Projects that are implemented with FAA funding must be on the airport's approved Airport Layout Plan (ALP). In some cases, regional system plan projects may require an environmental finding by the FAA, as required by the National Environmental Policy Act and Special Purpose Laws. Other projects may also require FAA air space review prior to implementation.

Cost Estimating

The methodology used to estimate costs for the recommended plan includes:

- Comparing existing facilities at each individual airport to facility/service objectives and performance measures identified for each airport's recommended system role.

- Identifying specific airport projects or actions needed to reach the airport's applicable objectives.
- Using estimated unit costs, applying these costs to specific airport needs/projects.

In this process, the needs, actions, and costs were first identified on an airport-by-airport basis, and compiled at system-level by project type. Costs presented in this chapter are based on unit costs for each type of facility. Unit costs were increased to allow for contingency expenses related to planning, engineering, and design. Importantly, the costs identified in this chapter will vary based on site-specific conditions that may require significant site preparation costs or other mitigation efforts. It is possible, depending on specific circumstances that costs presented in this chapter could vary by as much of a factor of four. Specific unit cost assumptions used to develop estimates presented in this chapter are available from MARC.

Units costs used in the system plan were obtained from recent similar projects completed in Kansas and Missouri. Wherever possible, actual costs were used as a baseline in the development of unit costs. The range of airports and their settings in the region cause actual costs to vary. Further, costs presented in this chapter have been developed to planning, rather than engineering, levels of detail and are based on 2015 U.S. dollars without increases to reflect future inflation.

Costs are aggregated by following categories:

- Airside facilities
- Landside facilities
- NAVAIDS/Lighting
- Land-use Compatibility/Environmental
- Sustainability
- Access/Services
- Other

The regional system plan estimates costs to fully develop the airport system, by implementing all identified projects, will be \$34 million. Costs associated with additional projects that are part of an individual airport's CIP or master plans are not included. These costs are only included when the regional system plan identifies the need for the same improvements. Further, the plan's totals do not include the estimated costs for providing another general aviation airport for the system. There are no active initiatives to develop an additional system airport at this time. However, when there is such a movement to development an additional airport, costs estimates would be developed.

System Plan Recommendations Projects by Type

For each project categories shown above, summary tables were developed showing the airport, its role in the regional system, the actual project, and the cost estimate for implementing the project. The system plan cost estimates, by project category, are summarized in Tables 9-1 through 9-7. It should be noted that projects at federally obligated airports in the NPIAS may be subject to federal requirements before these projects can be implemented.

Table 9-1 - Airside Projects

Airport	Role	Project Description	Reference no.	Cost Estimate
East Kansas City	Business	Widen RW 31'	RASP 1.1	\$2,347,250
East Kansas City	Business	Pavement Maintenance	RASP 1.2	\$400,000
Excelsior Springs Memorial	Business	Extend RW 2,000'	RASP 1.3	\$2,934,750
Excelsior Springs Memorial	Business	Widen RW 28'	RASP 1.4	\$1,101,412
Excelsior Springs Memorial	Business	Add Full Parallel Taxiway	RASP 1.5	\$3,023,134
Sherman Army Airfield	Business	Add Full Parallel Taxiway	RASP 1.6	\$2,880,073
Lawrence Smith Memorial	Business	Add Partial Parallel Taxiway	RASP 1.7	\$1,866,876
Gardner Municipal	Community	Extend RW 240'	RASP 1.8	\$368,296
Gardner Municipal	Community	Widen RW 21'	RASP 1.9	\$833,672
Gardner Municipal	Community	Add Turnarounds (2)	RASP 1.10	\$365,677
Miami County	Community	Add Full Parallel Taxiway	RASP 1.11	\$1,432,201
Noah's Ark	Community	Add Turnarounds (2)	RASP 1.12	\$365,677
Noah's Ark	Community	Pavement Maintenance	RASP 1.13	\$180,000
Roosterville	Community	Add Turnaround (1)	RASP 1.14	\$182,839
Roosterville	Community	Pavement Maintenance	RASP 1.15	\$75,000
			Total	\$18,356,858

Source: Jviation, Inc.

Table 9-2 - Landside Projects

Airport	Role	Project Description	Reference no.	Cost Estimate
Charles B. Wheeler Downtown	Regional	Add 38 Hangar Spaces	RASP 2.1	\$3,566,776
Lee's Summit Municipal	Regional	Add 600 sq. ft. Terminal Space	RASP 2.2	\$215,280
Lee's Summit Municipal	Regional	Add 101 Auto Parking Spaces	RASP 2.3	\$436,754
New Century Air Center	Regional	Add 5 Hangar Spaces	RASP 2.4	\$608,715
New Century Air Center	Regional	Add 14 auto parking spaces	RASP 2.5	\$29,007
East Kansas City	Business	Add 23 Hangar Spaces	RASP 2.6	\$2,043,342
East Kansas City	Business	Add 500 sq. ft. Terminal Space	RASP 2.7	\$179,400
East Kansas City	Business	Add 27 Auto Parking Spaces	RASP 2.8	\$55,800
Excelsior Springs Memorial	Business	Add Conference Room	RASP 2.9	\$75,348
Sherman Army Airfield	Business	Add 5 Hangar Spaces	RASP 2.10	\$563,605
Sherman Army Airfield	Business	Add 300 sq. ft. Terminal Space	RASP 2.11	\$107,640
Sherman Army Airfield	Business	Add 40 Auto Parking Spaces	RASP 2.12	\$111,100
Lawrence Smith Memorial	Business	Add 560 sq. ft. Terminal Space and a Conference Room	RASP 2.13	\$261,206
Gardner Municipal	Community	Add 16 Hangar Spaces	RASP 2.14	\$1,601,091
Miami County	Community	Add 3 Hangar Spaces	RASP 2.15	\$309,639
Miami County	Community	Add 14 Auto Parking Spaces	RASP 2.16	\$29,007
			Total	\$10,193,710

Source: Jviation, Inc.

Table 9-3 – NAVAIDS/Lighting Projects

Airport	Role	Project Description	Reference no.	Cost Estimate
Lee's Summit Municipal	Regional	Add ALS	RASP 3.1	\$2,600,000
Midwest National Air Center	Regional	Add GCO	RASP 3.2	\$44,000
East Kansas City	Business	Add REILs on RW 27	RASP 3.3	\$37,125
East Kansas City	Business	Add GCO	RASP 3.4	\$44,000
Excelsior Springs Memorial	Business	Add VGSI on both RW Ends	RASP 3.5	\$131,238
Excelsior Springs Memorial	Business	Add REILs both RW Ends	RASP 3.6	\$66,413
Excelsior Springs Memorial	Business	Add MIRL	RASP 3.7	\$254,594
Excelsior Springs Memorial	Business	Add GCO	RASP 3.8	\$44,000
Johnson County Executive	Business	Add REIL to RW 18	RASP 3.9	\$35,894
Sherman Army Airfield	Business	Add GCO	RASP 3.10	\$44,000
Lawrence Smith Memorial	Business	Add REILs both RW Ends	RASP 3.11	\$66,413
Lawrence Smith Memorial	Business	Add GCO	RASP 3.12	\$44,000
Gardner Municipal	Community	Add Non-Precision Approach (LPV desired)	RASP 3.13	\$72,765
Gardner Municipal	Community	Add MIRLs	RASP 3.14	\$254,361
Noah's Ark	Community	Add Lighted Windcone/Segmented Circle	RASP 3.15	\$29,713
Roosterville	Community	Add Lighted Windcone/Segmented Circle	RASP 3.16	\$29,713
			Total	\$3,798,228

Source: Jviation, Inc.

Table 9-4 – Land Use Compatibility/Environmental Projects

Airport	Role	Project Description	Reference no.	Cost Estimate
Charles B. Wheeler Downtown	Regional	Develop stormwater management plan	RASP 4.1	\$10,000
Charles B. Wheeler Downtown	Regional	Work w/Surrounding Municipalities to Enact Height Zoning Following Part 77	RASP 4.2	\$0
Lee's Summit Municipal	Regional	Work w/Surrounding Municipalities to Enact Height Zoning Following Part 77	RASP 4.3	\$0
Lee's Summit Municipal	Regional	Work w/Surrounding Municipalities to Adopt Land Use Controls to Prevent Airport Encroachment	RASP 4.4	\$0
Midwest National Air Center	Regional	Develop Noise Contours	RASP 4.5	\$10,000
Midwest National Air Center	Regional	Work w/Surrounding Municipalities to Enact Height Zoning Following Part 77	RASP 4.6	\$0
Midwest National Air Center	Regional	Work w/Surrounding Municipalities to Adopt Land Use Controls to Prevent Airport Encroachment	RASP 4.7	\$0
East Kansas City	Business	Identify On-Airport Properties Open for Aviation Development	RASP 4.8	\$10,000
East Kansas City	Business	Identify On-Airport Properties Open for Non-Aviation Development	RASP 4.9	\$10,000
East Kansas City	Business	Develop noise contours	RASP 4.10	\$10,000

Table 9-4 – Land Use Compatibility/Environmental Projects

Airport	Role	Project Description	Reference no.	Cost Estimate
East Kansas City	Business	Develop stormwater management plan	RASP 4.11	\$10,000
East Kansas City	Business	Wildlife hazard assessment/plan	RASP 4.12	\$25,000
East Kansas City	Business	Spill Prevention, Control, and Countermeasure Plan	RASP 4.13	\$10,000
East Kansas City	Business	Work w/Surrounding Jurisdictions to Attract Aviation Dependent Employers to the Airport Environs	RASP 4.14	\$0
East Kansas City	Business	Work w/Surrounding Jurisdictions to have the Airport included in their Comprehensive Plan	RASP 4.15	\$0
East Kansas City	Business	Work w/Surrounding Municipalities to Enact Height Zoning Following Part 77	RASP 4.16	\$0
Excelsior Springs Memorial	Business	Identify On-Airport Properties Open for Aviation Development	RASP 4.17	\$10,000
Excelsior Springs Memorial	Business	Identify On-Airport Properties Open for Non-Aviation Development	RASP 4.18	\$10,000
Excelsior Springs Memorial	Business	Develop noise contours	RASP 4.19	\$10,000
Excelsior Springs Memorial	Business	Develop stormwater management plan	RASP 4.20	\$10,000
Excelsior Springs Memorial	Business	Wildlife hazard assessment/plan	RASP 4.21	\$25,000
Excelsior Springs Memorial	Business	Spill Prevention, Control, and Countermeasure Plan	RASP 4.22	\$10,000
Excelsior Springs Memorial	Business	Work w/Surrounding Jurisdictions to Attract Aviation Dependent Employers to the Airport Environs	RASP 4.23	\$0
Excelsior Springs Memorial	Business	Work w/Surrounding Municipalities to Enact Height Zoning Following Part 77	RASP 4.24	\$0
Excelsior Springs Memorial	Business	Work w/Surrounding Municipalities to Adopt Land Use Controls to Prevent Airport Encroachment	RASP 4.25	\$0
Johnson County Executive	Business	Conduct wildlife hazard assessment	RASP 4.26	\$25,000
Sherman Army Airfield	Business	Identify On-Airport Properties Open for Aviation Development	RASP 4.27	\$10,000
Sherman Army Airfield	Business	Identify On-Airport Properties Open for Non-Aviation Development	RASP 4.28	\$10,000
Sherman Army Airfield	Business	Develop noise contours	RASP 4.29	\$10,000
Sherman Army Airfield	Business	Spill Prevention, Control, and Countermeasure Plan	RASP 4.30	\$10,000
Sherman Army Airfield	Business	Work w/Surrounding Jurisdictions to Attract Aviation Dependent Employers to the Airport Environs	RASP 4.31	\$0
Sherman Army Airfield	Business	Work w/Surrounding Municipalities to Enact Height Zoning Following Part 77	RASP 4.32	\$0
Sherman Army Airfield	Business	Work w/Surrounding Municipalities to	RASP 4.33	\$0

Table 9-4 – Land Use Compatibility/Environmental Projects

Airport	Role	Project Description	Reference no.	Cost Estimate
		Adopt Land Use Controls to Prevent Airport Encroachment		
Lawrence Smith Memorial	Business	Identify On-Airport Properties Open for Non-Aviation Development	RASP 4.34	\$10,000
Lawrence Smith Memorial	Business	Develop noise contours	RASP 4.35	\$10,000
Lawrence Smith Memorial	Business	Develop stormwater management plan	RASP 4.36	\$10,000
Lawrence Smith Memorial	Business	Wildlife hazard assessment/plan	RASP 4.37	\$25,000
Lawrence Smith Memorial	Business	Work w/Surrounding Jurisdictions to Attract Aviation Dependent Employers to the Airport Environs	RASP 4.38	\$0
Lawrence Smith Memorial	Business	Work w/Surrounding Municipalities to Enact Height Zoning Following Part 77	RASP 4.39	\$0
Gardner Municipal	Community	Spill Prevention, Control, and Countermeasure Plan	RASP 4.40	\$10,000
Gardner Municipal	Community	Work w/Surrounding Municipalities to Enact Height Zoning Following Part 77	RASP 4.41	\$0
Miami County	Community	Work w/Surrounding Municipalities to Enact Height Zoning Following Part 77	RASP 4.42	\$0
Miami County	Community	Work w/Surrounding Municipalities to Adopt Land Use Controls to Prevent Airport Encroachment	RASP 4.43	\$0
Noah's Ark	Community	Identify On-Airport Properties Open for Aviation Development	RASP 4.44	\$10,000
Noah's Ark	Community	Identify On-Airport Properties Open for Non-Aviation Development	RASP 4.45	\$10,000
Noah's Ark	Community	Spill Prevention, Control, and Countermeasure Plan	RASP 4.46	\$10,000
Noah's Ark	Community	Work w/Surrounding Jurisdictions to Attract Aviation Dependent Employers to the Airport Environs	RASP 4.47	\$0
Noah's Ark	Community	Work w/Surrounding Jurisdictions to have the Airport included in their Comprehensive Plan	RASP 4.48	\$0
Noah's Ark	Community	Work w/Surrounding Municipalities to Enact Height Zoning Following Part 77	RASP 4.49	\$0
Noah's Ark	Community	Work w/Surrounding Municipalities to Adopt Land Use Controls to Prevent Airport Encroachment	RASP 4.50	\$0
Roosterville	Community	Identify On-Airport Properties Open for Aviation Development	RASP 4.51	\$10,000
Roosterville	Community	Identify On-Airport Properties Open for Non-Aviation Development	RASP 4.52	\$10,000

Table 9-4 – Land Use Compatibility/Environmental Projects

Airport	Role	Project Description	Reference no.	Cost Estimate
Roosterville	Community	Work w/Surrounding Jurisdictions to Attract Aviation Dependent Employers to the Airport Environs	RASP 4.53	\$0
Roosterville	Community	Work w/Surrounding Jurisdictions to have the Airport included in their Comprehensive Plan	RASP 4.54	\$0
Roosterville	Community	Work w/Surrounding Municipalities to Adopt Land Use Controls to Prevent Airport Encroachment	RASP 4.55	\$0
			Total	\$350,000

Source: Javiation, Inc.

Table 9-5 – Sustainability Projects

Airport	Role	Project Description	Reference no.	Cost Estimate
Charles B. Wheeler Downtown	Regional	Energy Efficient Building Plan	RASP 5.1	\$10,000
Charles B. Wheeler Downtown	Regional	Establish Plan to Promote the Efficient Use of Water	RASP 5.2	\$0
Charles B. Wheeler Downtown	Regional	Establish Plan to Reduce the Generation of Solid Waste	RASP 5.3	\$0
Midwest National Air Center	Regional	Energy Efficient Building Plan	RASP 5.4	\$10,000
Midwest National Air Center	Regional	Establish a Plan to Promote the Efficient Use of Water	RASP 5.5	\$0
Midwest National Air Center	Regional	Establish a Plan to Reduce the Generation of Solid Waste	RASP 5.6	\$0
New Century Air Center	Regional	Plan to Increase Efficient Use of Water	RASP 5.7	\$0
East Kansas City	Business	Energy Efficient Building Plan	RASP 5.8	\$7,500
East Kansas City	Business	Establish a Plan to Promote the Efficient Use of Water	RASP 5.9	\$0
East Kansas City	Business	Establish a Plan to Reduce the Generation of Solid Waste	RASP 5.10	\$0
Excelsior Springs Memorial	Business	Energy Efficient Building Plan	RASP 5.11	\$7,500
Excelsior Springs Memorial	Business	Establish a Plan to Promote the Efficient Use of Water	RASP 5.12	\$0
Excelsior Springs Memorial	Business	Establish a Plan to Reduce the Generation of Solid Waste	RASP 5.13	\$0
Johnson County Executive	Business	Establish a Plan to Promote the Efficient Use of Water	RASP 5.14	\$0
Johnson County Executive	Business	Establish a Plan to Reduce the Generation of Solid Waste	RASP 5.15	\$0
Sherman Army Airfield	Business	Establish a Plan to Promote the Efficient Use of Water	RASP 5.16	\$0

Table 9-5 – Sustainability Projects

Airport	Role	Project Description	Reference no.	Cost Estimate
Sherman Army Airfield	Business	Improve Public Signage from Area Roadways	RASP 5.17	\$0
Lawrence Smith Memorial	Business	Energy Efficient Building Plan	RASP 5.18	\$7,500
Lawrence Smith Memorial	Business	Establish a Plan to Promote the Efficient Use of Water	RASP 5.19	\$0
Lawrence Smith Memorial	Business	Establish a Plan to Reduce the Generation of Solid Waste	RASP 5.20	\$0
Lawrence Smith Memorial	Business	Establish a Program to Promote Recycling	RASP 5.21	\$0
Gardner Municipal	Community	Establish a Program to Promote Recycling	RASP 5.22	\$0
Miami County	Community	Establish a Program to Promote Recycling	RASP 5.23	\$0
Noah's Ark	Community	Establish a Program to Promote Recycling	RASP 5.24	\$0
			Total	\$42,500

Source: Jviation, Inc.

Table 9-6 – Access/Service Projects

Airport	Role	Project Description	Reference no.	Cost Estimate
Lee's Summit Municipal	Regional	Provide Access to Public Transit	RASP 6.1	\$0
Midwest National Air Center	Regional	Improve Airport Entrance Road	RASP 6.2	\$5,000
Midwest National Air Center	Regional	Improve Public Signage for Area Roadways	RASP 6.3	\$0
Midwest National Air Center	Regional	Provide Access to Public Transit	RASP 6.4	\$0
East Kansas City	Business	On-Site Ground Transportation (Courtesy Car)	RASP 6.5	\$10,000
Excelsior Springs Memorial	Business	Add Jet A Fuel	RASP 6.6	\$580,800
Excelsior Springs Memorial	Business	On-Site Ground Transportation (Courtesy Car)	RASP 6.7	\$10,000
Sherman Army Airfield	Business	Establish a Program to Promote Recycling	RASP 6.8	\$0
Lawrence Smith Memorial	Business	Add Jet A Fuel	RASP 6.9	\$580,800
Noah's Ark	Community	Improve Airport Entrance Road	RASP 6.10	\$5,000
Excelsior Springs Memorial	Business	Full-Service FBO	RASP 6.11	*\$0
Lawrence Smith Memorial	Business	Full-Service FBO	RASP 6.12	*\$0
			Total	\$1,191,600

Source: Jviation, Inc.

*Cost assumed by third party.

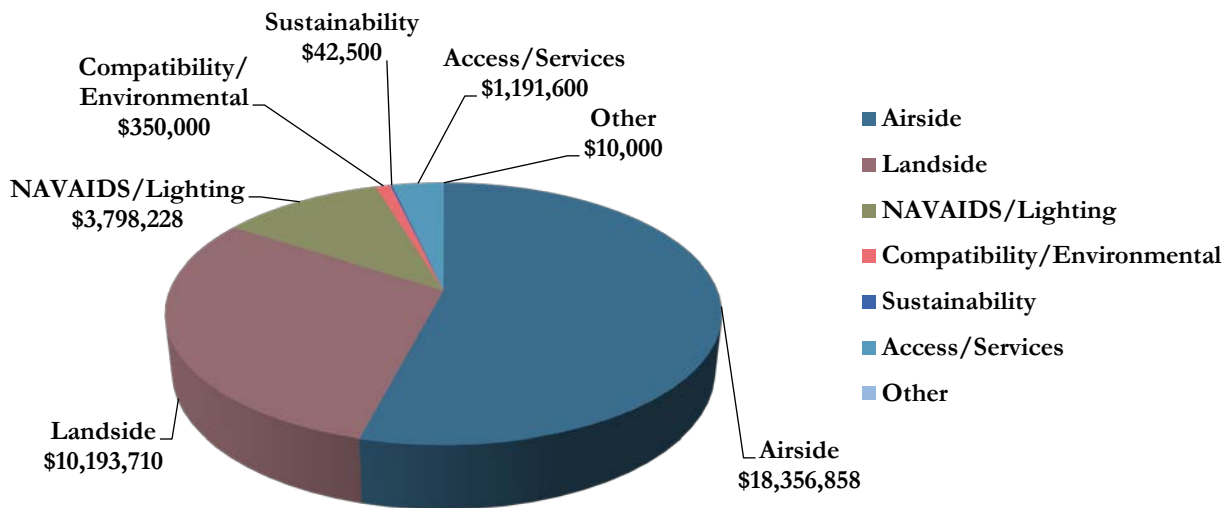
Table 9-7 – Other Projects

Airport	Role	Project description	Rasp ref. Num.	Cost Estimate
Noah's Ark	Community	Assessment of Airport Annual Economic Impact	RASP 7.1	\$5,000
Roosterville	Community	Assessment of Airport Annual Economic Impact	RASP 7.2	\$5,000
			Total	\$10,000

Source: Jviation, Inc.

Figure 9-1 illustrates the distribution of total estimated development costs by project type. The greatest cost for recommended system improvements relates to airfield projects with primary focus on runway and taxiway improvements. For airports eligible to compete for FAA funding, airfield related projects can often be accomplished through grants from the FAA. As indicated earlier in the study, eight of the 13 general aviation airports in this regional system are included in the NPIAS, making them eligible for FAA funds. For the remaining five study airports, airfield projects will need to be accomplished with state or private funds. Three of the 13 study airports (East Kansas City, Noah's Ark and Roosterville) rely exclusively on private funding. Lack of any public funding poses challenges for implementing system plan recommendations at these study airports.

Figure 9-1 – Summary of Project Costs by Type



Source: Jviation, Inc.

The second highest cost category relates to landside projects, primarily related to providing additional hangar storage capacity at study airports. FAA typically does not provide funds for hangar construction because these facilities are revenue-generating. Often, hangars, especially conventional hangars, are constructed at public airports with private, third-party funding. When hangars are constructed with private funds, the airport typically leases the land for the hangar to the developer and collects land rental income.

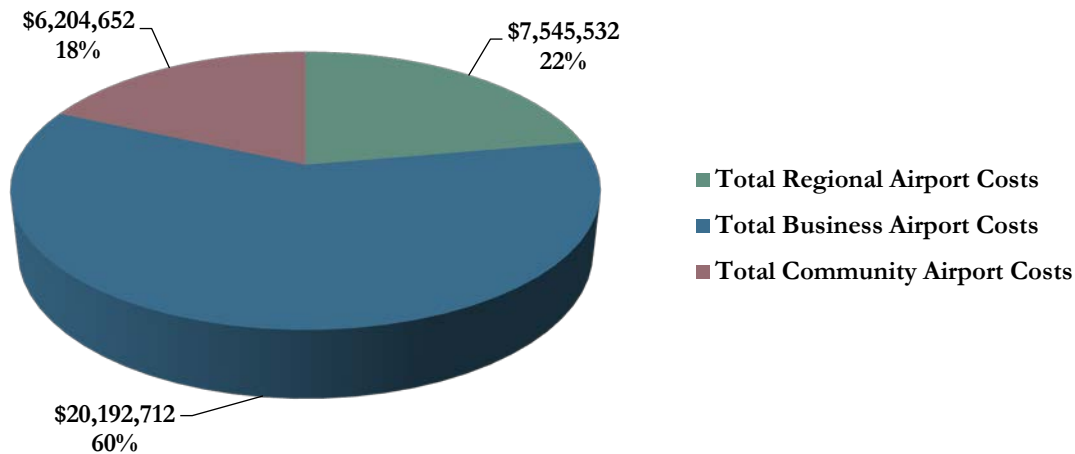
Airports or their public owner more often do pay to construct and then lease T-hangars, collecting the revenue from hangar rental. Hangar rental rates are set so that the cost of hangar construction is amortized, typically over a 20-year time frame. General aviation airports, most often, do not have sufficient surplus revenue to cover the cost of hangar construction. Other sources of local revenue, such as bonds, and sometimes state grants, can be used to cover the cost of hangar development. Hangar construction at the three privately-owned airports would need to be accomplished completely with private funds.

Tables 9-1 through 9-7 provide information that shows, by airport, which projects are assigned to the project categories shown in Figure 9-1.

Costs Summary by Airport Role

In addition to the estimated system development costs by project type, a summary of estimated costs by airport role (Regional, Business, and Community) was developed and is shown in Figure 9-2. This graphic was developed with airport-specific projects shown earlier in Tables 9-1 through 9-7. In Figure 9-2, more than half of the plan’s estimated costs for improving the regional system are associated with improvements to airports in the Regional role category. All system plan airports in the Regional role are eligible to compete for FAA and state grants. This eligibility helps to increase the feasibility of actual project implementation.

Figure 9-2 – Summary of Project Costs by Role



Source: Jviation, Inc.

Funding Eligibility

In general, airport facilities that are eligible for FAA and state funding must be available for public use (i.e. not encumbered by an exclusive use agreement), and they are required to meet appropriate FAA design standards. Projects that are eligible for state and federal funding are subject to priority ranking, as well as funding availability. FAA Order 5100.38D from Airport Improvement Program (AIP) Handbook presents a detailed list of projects that are and are not eligible and for FAA funding.

In both Missouri and Kansas, airport development projects are usually funded by several sources, including the FAA AIP, the Missouri Department of Transportation State Aviation Trust Fund Program, Kansas Airport Improvement Program, local (airport and/or city/county) funding and private investment.

FAA Airport Improvement Program (AIP)

The FAA AIP was created by the Airport and Airways Act of 1982 to assist in the development of a nationwide system of public-use airports. AIP replaced the previous programs, including the Airport Development Aid Program (ADAP) and the earlier Federal Aid to Airports Program (FAAP). AIP provides an increased level of funding, a higher federal participation rate and greater project eligibility. Amendments to the program since 1982 have consistently increased funding levels, FAA project participation rates, and project eligibility.

All airports in the National Plan of Integrated Airport Systems (NPIAS) are eligible for FAA funding. The NPIAS is an unconstrained list of airport needs for airports included in the federal system. However, not all projects or all airports identified in the NPIAS receive FAA funding.

In most cases, an airport annually submits its Capital Improvement Projects (CIPs) with new projects and estimates to state funding agencies, so the state can make updates to its five-year plan. This process ultimately leads to the identification of projects that will receive state and federal funding; however, the list of projects on the CIP is constrained by federal considerations, including local match.

As previously noted, AIP sets limits on project eligibility. Generally, grant eligible items include airfield and aeronautical related facilities, such as runways, taxiways, aprons, lighting, and visual aids, as well as land acquisition planning and environmental tasks needed to accomplish airport improvement projects. Equipment eligibility is limited to safety equipment such as Aircraft Rescue and Firefighting (ARFF) trucks and snow removal equipment (SRE). Mowers, earth-moving equipment, and airport operations vehicles are not eligible for AIP funding. The FAA uses a priority system to rank grant requests. Generally, the farther the project is from the runway, the lower priority it receives (e.g. runways have priority over taxiways, which have greater priority than aprons, which have priority over roads, etc.). However, development or equipment required by rule or law has a high FAA priority.

Historically, federal participation in the AIP was 90 percent of the eligible cost of airport projects, leaving the airport sponsor responsible for the other 10 percent. After Sept. 11, 2001, however, the U.S. Congress authorized increased federal participation from 90 to 95 percent because of the economic impact 9/11 had on local resources. On Feb. 6, 2012, the U.S. Senate passed a four-year (FY 2012 to 2015) reauthorization and reform of the FAA, which returned the federal participation on AIP grants from 95 percent to the previous historical level of 90 percent.

Non-primary, FAA eligible airports, as included in ASSET II, receive an entitlement of \$150,000 per year from the FAA AIP. Approximately half of the annual AIP appropriations can be dispersed by the FAA at their discretion, rather than through fixed-entitlement grants. The FAA has many priority programs they fund each year, such as runway safety areas, runway surface treatments, and projects which improve overall system capacity (e.g. new runways at large hub airports). The FAA generally assigns the highest project priority at general aviation airports for discretionary funding of safety and pavement preservation projects. As a result, terminal buildings, auto parking and tie-down aprons are generally given a low priority by FAA. Because Missouri is a block-grant state, they have a greater influence on how funding is distributed to FAA eligible general aviation airports in their state.

Missouri DOT (MoDOT) State Aviation Trust Funds

Established in 1998, the Missouri State Aviation Trust Fund is an important economic development tool that was last extended through legislation in 2012 and will remain in place through 2023. Revenue for this program is generated from a sales tax on jet fuel sold in the state. Of the taxes generated, 3.0 percent is allocated to a trust fund. With a 10 percent local match, grants can be issued for up to 90 percent of project costs with funding coming from state trust funds.

Kansas DOT (KDOT) Airport Improvement Program

The Kansas Airport Improvement Program is a component of the 1999 Kansas Comprehensive Transportation Program. The program is funded by Transportation Works for Kansas (T-WORKS), an \$8 billion, 10-year transportation program. As part of this program, \$5 million is allocated to Kansas airports annually in reimbursement grants, and all public-use airports in the state, except those classified as primary (commercial) airports, are eligible for such funding. A local match is required for the state grants, with KDOT participating at the following rates (for public-use, non-primary airports):

- 90 percent for sponsors with a population of less than 3,000 and for privately-owned, public-use airports.
- 75 percent for sponsors with a population between 3,000 and 10,000.
- 50 percent for sponsors with a population greater than 10,000.
- 95 percent for planning and design.

State participation is limited to \$800,000 for most projects. Exceptions include full-depth reconstruction of an existing runway, which is eligible for a maximum of \$1.2 million, and new runway construction, which is capped at \$1.6 million

It is important to note that project funding eligibility is not necessarily administered in the same ways among FAA, MoDOT, and KDOT. Generally speaking, no eligibility or a low priority is assigned to revenue-generating projects. As part of regional system plan's implementation, individual airport sponsors will need to consult with the two applicable funding agencies to determine the eligibility of their project for rank, and then to determine the overall priority this project may be given by FAA, MoDOT or KDOT.

RASP Airport Funding Sources

Table 9-8 provides a recap of funding sources by airport role. Only the airports in the Regional role all have access to both FAA and state grants to help fund their development needs. For airports relying on state and local funding sources, implementation of system plan recommendations will be more challenging. Implementation of study recommendations will be even more of a challenge for the three study airports that rely exclusively on private funds for their development needs.

Table 9-8 - Airport Funding Eligibility

Airport	Local/Public Funding Eligibility	Private Funding Only	Eligible for FAA Funding	Eligible for State Funding
Regional Airports				
Charles B. Wheeler Downtown	EF		✓	MoDOT
Lee's Summit Municipal	EF		✓	MoDOT
Midwest National Air Center	EF, GF		✓	MoDOT
New Century Air Center	EF, GF		✓	KDOT
Business Airports				
East Kansas City		✓		n/a
Excelsior Springs Memorial	EF			MoDOT
Johnson County Executive	EF, GF		✓	KDOT
Lawrence Smith Memorial	GF		✓	MoDOT
Sherman Army Airfield	GF			KDOT
Community Airports				
Gardner Municipal	GF		✓	KDOT
Miami County	GF		✓	KDOT
Noah's Ark		✓		n/a
Roosterville		✓		n/a

EF/Enterprise Fund: Within a city or county's operating departments, some can operate similar to private business organization (golf courses, water & sewer utility, airport, etc.). The fund establishes a separate accounting and financial reporting mechanism for municipal services for which a fee is charged in exchange for goods or services.

GF/General Fund: Every city or county maintains a general fund where all revenue belongs to the general fund unless specifically earmarked for another fund. This fund supports basic city or county operations and services.

n/a - Not Applicable for MoDOT/Missouri Department of Transportation or KDOT/Kansas Department of Transportation.

Source: FAA, KDOT, MoDOT, and City/County Annual Budgets

Additional Actions to Reach Framework Goals and Performance Measure Objectives

Recommendations for study airports are essentially divided into two categories: **projects and actions** needed for the study airports to meet their facility/service objectives established in the system plan and **other actions** needed to elevate system performance relating to the framework goals and respective performance measures. This section discusses those other actions.

Aviation is a dynamic industry; one that is constantly changing. As aviation changes, the system of airports supporting demand in the Kansas City Metropolitan Area will continue to change. The regional system plan identified specific development projects that are needed to elevate system performance along with other actions that are desirable to improve system performance.

The regional aviation plan was completed using a performance-based approach to evaluate the regional airport system. A major output of this approach is a “report card” for each study airport. This report provides sustainability to the planning process. As part of the continuous planning effort, the airport report cards should be periodically updated. MARC has an established Aviation Advisory Committee, and the study airports, MoDOT, KDOT and the FAA are members of this committee. The committee meets on a bi-monthly basis. This plan recommends that the committee, at least twice a year, should review the airport report cards to determine if recommended projects from the system plan have been accomplished. This review can also be used to determine if other actions have been accomplished that enhance system performance. By keeping the airport report cards current, MARC and others will be able to document and demonstrate specifically how system performance has been elevated since this plan was update in 2015.

As part of the follow-up and continuous planning process, appropriate coordination and communication activities and actions should be performed. Many of these activities involve communication with the study airports and surrounding municipalities/jurisdictions. MARC may be a resource to help facilitate some of the needed airport-to-community dialogue. As part of the regional system plan, municipalities in proximity to each of the study airports have been identified and mapped. As part of this exercise, municipalities in proximity to the study airports were reviewed for: 1. taking steps to adopt land-use controls that protect airports from incompatible encroachment, and 2. enacting height zoning in the airport environs that follows FAA 14 CFR Part 77 height restriction guidelines. Chapter 5 of the plan provides a list of the study airports along with their adjacent municipalities, and shows which municipalities have appropriate steps for land-use compatibility planning and height zoning. The regional system plan has adopted an objective for all study airports to have all of their surrounding municipalities provide appropriate land-use controls and to adopt height zoning.

The plan also establishes an objective for study airports to be recognized in the Comprehensive Plan of each applicable surrounding municipality. Currently, no study airports have surrounding municipalities with 100 percent compliance with objectives for compatible land-use control, height zoning restrictions, and comprehensive plan inclusion. Study airports, with MARC support, should use information provided as part of this plan as a means to reach out to neighboring municipalities. This outreach can help to bridge gaps as they relate to these planning deficiencies. An objective was established in the plan for all airports with roles of Regional and Business to have regular communication with surrounding municipalities by attending regularly scheduled meetings. Opening up and reinforcing lines of communication between the airports and their surrounding municipalities represents a positive step toward reaching system plan objectives related to:

- Attracting compatible and aviation-related businesses to the airport environs.
- Having airport recognition in all applicable local comprehensive plans.
- Establishing land-use controls that protect the airport from incompatible encroachment.
- Adopting height zoning restrictions that are compliant with FAA 14 CFR Part 77 guidelines.

The framework goals and associated performance measures for future system performance were established through stakeholder input. One objective set by the Project Steering Committee and the study airports themselves was that all of the regional system's airports should have information that documents their current positive economic impact.

KDOT began an update to its statewide economic impact study in 2015, which will provide a current economic impact assessment for the Kansas airports included in this plan. MoDOT anticipates an update to its statewide aviation system plan beginning in 2017, pending availability of FAA funding. The last statewide economic impact study prepared by MoDOT did not include East Kansas City, Roosterville, or Noah's Ark; the latter two privately-owned airports are not part of the Missouri State Airport System. It is recommended, however, for Missouri's next statewide economic impact study updated that estimates of economic impact for East Kansas City, Noah's Ark, and Roosterville be included as part of the state study. The additional cost to prepare estimates of economic impact for these three airports, at that time, will be nominal.

The regional aviation system plan framework goals and their associated performance measures are focused on helping the Kansas City area establish a sustainable airport system. The Transportation Research Board (TRB), through its Airport Cooperative Research Program (ACRP), has developed many resources devoted to helping small and general aviation airports improve their performance and increase different facets of their sustainability. The following ACRP resources are focused on helping airports increase their financial sustainability, environmental stewardship, and land-use compatibility. To enhance airport performance, the ACRP listed resources provide information on ways to improve airport operational efficiency, planning, governance, communications, preservation, environmental management, and land-use compatibility.

Study airports may benefit from information contained in one or more of the following ACRP studies:

ACRP Airport Management Reference Tools

- 01-04 Report 28: Marketing Techniques for Small Airports
- 01-08 Report 47: Guidebook for Developing and Leasing Airport Property
- 01-17 Report 77: Guidebook for Developing General Aviation Airport Business Plans
- 10-15 Report 123: A Guidebook for Airport Winter Operations
- 02-22 Report 80: Incorporating Sustainability into Traditional Airport Projects
- 03-11A Report 44: Guidebook for the Preservation of Public-Use Airports
- 07-10 Report 113: General Aviation Facility Planning
- 11-01/Topic 01-07 LRD 7: Airport Governance and Ownership
- 11-01/Topic 02-03 LRD 9: Case Studies on Community Challenges to Airport Development
- 11-01/Topic 05-04 LRD 23: A Guide for Compliance with Grant Agreement Obligations to Provide Reasonable Access to an AIP-Funded Public Use General Aviation Airport
- Synthesis 1: Innovative Finance and Alternative Sources of Revenue for Airports
- Synthesis 10: Airport Sustainability Practices
- Synthesis 36: Understanding the Value of Social Media at Airports for Customer Engagement
- Report 16: Guidebook for Managing Small Airports

ACRP Environmental Reference Tools

- 02-05 Report 15: Guidebook on Community Responses to Aircraft Noise
- 02-13 Report 43: Guidebook for Improving Environmental Performance at Small Airports
- 02-13 Report 45: Guidebook for Improving Environmental Performance at Small Airports
- 02-48 Assessing Community Annoyance of Helicopter Noise
- 04-06 A Report 32: Guidebook for Addressing Aircraft/Wildlife Hazards at General Aviation Airports
- 09-08 Report 125: Balancing Airport Stormwater and Wildlife Hazard Management: Analysis Tools and Guidance
- 11-01/Topic 04-01 LRD 20: Airport Responsibility for Wildlife Management
- 11-01/Topic 04-06 LRD 22: The Role of the Airport Sponsor in Airport Planning and Environmental Reviews of Proposed Development Projects Under the National Environmental Policy Act (NEPA) and State Mini-NEPA Law
- 11-02/Task 21 Report 122 Innovative Airport Responses to Threatened and Endangered Species
- Synthesis 9: Effects of Aircraft Noise

ACRP Land Use Reference Tools

- 11-01/Topic 01-05 LRD 5: Responsibility for Implementation and Enforcement of Airport Land-Use Zoning Restrictions
- 11-01/Topic 02-01/02 LRD 14: Achieving Airport Compatible Land Uses and Minimizing Hazardous Obstructions in Navigable Airspace.
- 11-01/Topic 03-01 LRD 12: Fair Disclosure of Airport Impacts in Real Estate Transfers 10-25: Public Notification Programs at Airports
- 03-03 Report 27: Enhancing Airport Land Use Compatibility
 - Volume 1: Land Use Fundamentals and Implementation Resources: lots of pertinent info to peruse
 - Volume 2: Land Use Survey and Case Study Summaries

All TRB/ACRP resources are free and can be downloaded or viewed on the ACRP website, www.trb.org/ACRP/ACRP.aspx. Some of the ACRP resources referenced above are aimed at helping study airports with financial sustainability, one of the framework goals of the plan. Individual airport tools, discussed in the next section, were prepared as part of the regional system plan to identify additional resources that can be referenced to assist with land-use compatibility and environmental sustainability.

System Plan Implementation Tools

Four specific tools were prepared for each study airport, designed to help with education, communication, and implementation regarding system plan recommendations.

- Environmental Resource Reports — For airports to be good environmental stewards, they should be aware of areas of environmental importance that are part of or near the airport environs. As part of the regional system plan, research was completed that documented some, but not all, of the 16 environmental factors that would typically be considered in a federally-funded airport environmental

assessment. Maps in these reports depict known environmental resources and the proximity of these resources to each airport. Reports for each airport's environmental reports also provide information on additional resources (FAA and other) that can be used by the study airports to enhance environmental sustainability.

- Land-use reports — As part of the plan, GIS mapping was completed to identify all municipalities that are in proximity to each study airport. The results of this mapping are contained in this individual airport report. Data in these reports shows which surrounding municipalities have taken appropriate steps to control land-use encroachment around airports and have adopted height zoning in compliance with Part 77. The land-use reports also provide mapping that reports on pervious and impervious surfaces in the airport environment. The pervious areas of airports might be useful to offset some of the impervious surfaces of more highly developed areas.
- Ground-access reports — For airports to be effective transportation resources, ground access to the airports must be adequate and efficient. Furthermore, when visitors arrive in the area of the general aviation airports, for the facility to be most effective, one or more ground transportation services should be available on-site at each airport. The Ground Access Reports provide information on primary roads and highways providing airport access. In addition, each airport's Ground Access Report provides information on ground-access improvements included in MARC's Transportation Improvement Program (TIP) and the Kansas City regional metropolitan transportation plan (MTP) projects. The ground-access reports show roadway and airport connections.

The communication process for this plan reached out to regional businesses that already use the study airports to improve their efficiency. These businesses ranked a series of factors in terms of their importance to the location of their business in the metropolitan area. Proximity to highway/roadway access ranked number one, and proximity to a general aviation airport ranked second. This information from regional businesses helps to reinforce the importance of the link between highway access and the study airports, and these connections are highlighted in the Ground Access Reports.

- System plan recommendations/airport benefits — it is important that each study airport be able to quickly and easily understand its individual and specific recommendations. This individual airport report summarizes and pulls together major findings, conclusions, and recommendations for each study airport. The summary report includes projects needed to meet all airport specific facility/service objectives and actions needed to meet applicable performance measure objectives. All costs related to airport improvements are also summarized. Study airports support economic impacts and other uses that benefit the communities that the airport serves. These benefits are summarized in this report. In addition, a map that documents non-stop instrument flight rule (IFR) flights to and from the airport is provided in this report. The IFR map helps to visually document the important role that the study airports play by serving local and visiting businesses.

These implementation tools, along with the study's final technical report and executive summary, have been distributed to all study airports.