A Proposal to Revise the Oklahoma Airport System Plan

Tier I and II Regional Business Airports

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Acknowledgment

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Introduction

Airports included in the Oklahoma Airport System Plan (OASP) are functionally classified as business service airports, district airports, and community service airports. In this paper, criteria are developed for further classifying the regional business airports into Tier I and Tier II regional business airports. The purpose of this further classification is to recognize the greater contribution of some regional business airports to the Oklahoma airport system due to their location and to help guide the programming of state and federal airport grant funds among the regional business airports during the next decade.

For all practical purposes, the major programming decisions for this decade have been made. This paper, which is intended to result in a modification to the OASP, provides criteria for designating Tier I and Tier II regional business airports and demonstrates the application of the criteria to the currently designated regional business airport system. The paper is not intended to modify in any way the Commission's adopted FY 2007 – FY 2009 Capital Improvement Program or the Commission's adopted system planning objective to develop each regional business airport to its minimum design standards.

Characteristics of a Regional Business Airport

The characteristics of a regional business airport are described in the OASP, which was adopted in December 1999. A key characteristic of a regional business airport is that it serves multiple communities. Typically, it will serve a community of at least 5,000 people (generally larger) and a county population of 10,000 or more. Regional business airports serve major employers that are defined as businesses with 50 or more employees. Major employers are typically the types of companies that use corporate aircraft or whose customers or suppliers use corporate aircraft.

It is critical that the sponsor of a regional business airport demonstrate the financial capability to continue to develop, maintain, and operate their airport and to demonstrate continuing interest in their airport. For the regional business airport system to work effectively, airport sponsors must be both financially capable and have a strong community interest in their airports.

Typically, a regional business airport will have 20 or more based aircraft and provide services to general aviation piston-powered aircraft, turboprop, and jet aircraft. The airport is attended and has an on-site manager. The airport has jet fuel and aviation gasoline available. Typically, there will be a fixed base operator providing airframe and engine repair services, flight instruction, and aircraft rental. The airport also has a modern public terminal building.

A regional business airport either has a runway 5,000 feet or longer in length, or one that can be extended to at least 5,000 feet, and the airport can be developed to Airport Reference Code (ARC) B-II or C-II design standards. A regional business airport has at least one non-precision instrument approach. In the future, with the improving global positioning system (GPS) technology, many of the regional business airports will have approach minimums as low as three-quarters of a mile visibility, 300-feet ceiling height, and vertical guidance.

Terminal weather reporting is essential for achieving an all-weather capability at a regional business airport. Most of the regional business airports have an aviation weather observation

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system (AWOS) on the airport or have a system scheduled for installation. An AWOS system at the destination airport allows a pilot to obtain, prior to take-off from his or her departure airport and during flight, the weather at the destination airport.

Airport Types

The OASP identifies 49 regional business airports. The Federal Aviation Administration (FAA) classifies three of these airports as primary commercial service airports — Lawton-Fort Sill Regional Airport, Tulsa International, and Will Rogers World. The FAA classifies two additional airports as non-primary commercial service airports — Enid Woodring Regional Airport and Ponca City Regional Airport. Since commercial air carriers are no longer serving Enid and Ponca City, the FAA is expected to change the airport classification for these two airports from non-primary commercial service to general aviation the next time the National Plan of Integrated Airport Systems (NPIAS) is revised. The remaining 43 airports are general aviation type airports. The FAA designates three of the general aviation type airports — Norman-Max Westheimer; Tulsa-Richard L. Jones, Jr; and Oklahoma City-Wiley Post — as reliever airports.

Regional Business Airport Criteria

Specific criteria were used during development of the OASP to functionally classify an airport as a regional business airport. These criteria were applied such that an airport needed to have affirmative answers to the majority of the questions to be functionally classified as a regional business airport. These criteria, taken directly from the OASP, are listed in this section. In addition to the application of the criteria, a series of public meetings were held during which the airport sponsors were provided an opportunity to provide additional information to support the regional business airport designation.

System Planning Criteria

- Does the airport serve multiple communities of greater than 2,500 persons? (Y or N)
- Is the number of highway miles from the airport to the center of the local sustaining economy less than 25 miles? (Y or N)
- Is the number of highway miles to the nearest GU-II or T airport greater than 25 miles? (Y or N)
- Is the airport location needed to provide air access to a part of the state that would not otherwise be served? (Y of N)
- Is the city population served greater than 5,000 persons? (Y or N)
- Is the county population served greater than 10,000 persons? (Y or N)
- Are annual retail sales greater than 0.2 percent of the state's retail sales? (Y or N)
- Is the county's income greater than 0.2 percent of the state's income? (Y or N)
- Is the county's farm and ranch income greater than 0.4 percent of the state's farm and ranch income? (Y or N)
- Is the county's mineral income greater than 0.4 percent of the state's mineral income? (Y or N)
- Is the dollar value of annual residential building permits (1997) greater than $1 million? (Y or N)
- Is the county's employment greater than 0.2 percent of the state's employment? (Y or N)

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- Is the number of private corporations with more than 50 employees greater than 10? (Y or N)
- Is there a private employer with 150 employees or more? (Y or N)
- Is there a significant on-airport industry requiring a GU-II or T runway? (Y or N)
- Is there a demonstrated ability of the community to promote business and local job formation? (Y or N)
- Is the airport location consistent with the Oklahoma Department of Transportation (ODOT) 1995 statewide intermodal transportation plan (i.e., is the airport located in a National Highway System [NHS] or economic development corridor)? (Y or N)

Sponsor Criteria

- Has the sponsor demonstrated the financial capability to operate and maintain the airport? (Y or N)
- Has the sponsor consistently demonstrated an interest in the airport? (Y or N)

Demand Criteria

- Is the number of active based aircraft greater than 20? (Y or N) or
- Is the number of based turboprop aircraft greater than 2? (Y or N) or
- Are there any based jets? (Y or N)

Services Criteria

- Is the airport attended? (Y or N)
- Is there an airport manager on the airport? (Y or N)
- Are fixed base operator or repair services available? (Y or N)
- Is aviation gasoline available? (Y or N)
- Is Jet A fuel available? (Y or N)
- Is there a public terminal? (Y or N)

Airport Planning Criteria

- Is the current OASP role GU-II or T? (Y or N)
- Does the airport have an approved airport layout plan that meets current FAA requirements? (Y or N)
- Does the airport have an Airport Master Plan (AMP) or Airport Action Plan (AAP) that the sponsor is using to guide development of the airport? (Y or N)

- Is the surrounding land use compatible with a GU-II or T role? (Y or N)
- Does the airport have an adopted height hazard zoning ordinance? (Y or N)

Airfield Geometric Criteria

- Will it cost less than $2 million to extend the runway to 5,000 feet corrected for altitude? (Y or N)
- Is the runway width 75 feet or greater? (Y or N)
- Does the runway have a full parallel taxiway or is a full parallel taxiway economically feasible? (Y or N)

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- Is the taxiway width 35 feet? (Y or N)
- Are the runway protection zones (RPZs) for the current published approach owned fee simple or controlled through easements? (Y or N)
- Does the airport have a 34:1 approach slope to one runway end, and does the airport sponsor own fee simple or have easements for the RPZ for that approach? (Y or N)
- Does the airport runway safety area meet the criteria for approach category C aircraft, 500 feet wide and 1,000 feet beyond runway end? (Y or N)
- Does the airport meet FAR Part 77 criteria? (Y or N)
- Does the airport have a non-precision approach to one runway end? (Y or N)
- Does the airport have a rotating beacon? (Y or N)
- Does the airport have a lighted wind indicator? (Y or N)
- Does the airport have medium intensity runway lights? (Y or N)

Tier I and Tier II Criteria

In this section criteria are developed to divide the 49 regional business airports into two groups, Tier I and Tier II. Why are we doing this? Collectively, the 49 regional business airports, when developed to their minimum design standards, will provide reasonable access for business jet aircraft to almost all communities in Oklahoma. Reasonable access to a community is defined as the community being within a 25 mile radius or about 30 minutes ground travel time from a regional business airport. The FAA uses this definition of reasonable access for planning the NPIAS and surveys of business aircraft users show that they support this definition. (See *Survey of Business Aircraft Users in Texas*, Texas Transportation Institute, June 2001).

Completion of the regional business airport system will make almost all communities and counties economically competitive from the single criterion of access to the community by business jet aircraft. Of course, many other factors besides access by business jet aircraft influence a community's economic competitiveness. Other factors, such as access to the interstate highway system, the quality of the school system, the availability of a trained labor force with the requisite skills, the size of the market area served by the community and the availability and cost of housing impact a community's economic competitiveness. Given the heterogeneous concentration of population and economic activity throughout Oklahoma, the geographical size of the state, and the aviation demand, some regional business airports are geographically located to make a greater contribution to the airport system than are others.

Significant advancements in the capability of the regional business airport system have been achieved during the past 10 years. Further advancements to the regional business airport system will result from projects currently being planned, designed, programmed, and constructed. The dollar amount of the capital invested in the development of the regional business airport system by local communities, the state, and the FAA is in the millions of dollars; additional millions are in the planning stages. The Oklahoma Aeronautics Commission's (OAC) objective of completing the development of all 49 regional business airports to their minimum design standard is in sight and this objective will be close to completion within this decade. To plan for the further development of regional business airports, criteria were developed to divide the regional business airports into two groups, Tier I and Tier II. The following sections describe and apply these criteria.

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Tier I Criteria

Airport Type

The three primary commercial service airports, the two non-primary commercial service airports and the three general aviation reliever airports are defined as Tier I airports due to their obvious importance to the Oklahoma airport system. As shown below, these eight airports also meet the other criteria for a Tier I regional business airport.

The first criterion is that all commercial service, non-primary commercial service, and general aviation reliever airports are designated as Tier I regional business airports.

Metropolitan and Micropolitan Statistical Areas

The population of Oklahoma is heavily concentrated in the Oklahoma City, Tulsa, and Lawton Metropolitan Statistical Areas and, to a lesser extent, in the Fort Smith Metropolitan Statistical Area. Metropolitan Statistical Areas are designated by the U.S. Office of Management and Budget and are composed of a single county or a group of counties (Figure 1). The Metropolitan Statistical Areas are forecast to have the greatest increase in population of any area in the state during the next two decades. The Interstate 35 corridor, anchored by Ardmore on the south and Blackwell-Tonkawa on the north, and the Interstate 44 corridor, anchored by Lawton on the southwest and Miami on the northeast, are high-population and high-economic growth corridors. The areas of the state with the highest concentration of population and economic activity have the greatest demand for access by business jet aircraft.

Table 1 shows the four Metropolitan Statistical Areas in Oklahoma and their counties, their estimated 2005 population, and their percent of the State's 2005 population. The population of the two largest Metropolitan Statistical Areas comprises 57 percent of the state's population, while the population of the four Metropolitan Statistical Areas combined comprises 63 percent of the state's population. Oklahoma has a largely urban population and is forecast to become more urbanized as the population increases.

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Table 1. Oklahoma Metropolitan Statistical Areas and 2005 Estimated County Populations

Metropolitan Statistical Area	County	July 1, 2005 Estimated County Population	Percent of Oklahoma Population
Lawton	Comanche	112,400	
Total		**112,400**	**3.17**
Fort Smith	Le Flore	49,500	
	Sequoyah	40,900	
Total		**90,400**	**2.55**
Oklahoma City	Canadian	98,700	
	Cleveland	224,900	
	Grady	49,400	
	Lincoln	32,300	
	Logan	39,900	
	McClain	30,100	
	Oklahoma	684,500	
Total		**1,159,800**	**32.69**
Tulsa	Creek	68,700	
	Okmulgee	39,700	
	Osage	45,500	
	Pawnee	16,900	
	Rogers	80,800	
	Tulsa	572,100	
	Wagoner	64,200	
Total		**887,900**	**25.03**
Totals for All MSAs		**2,250,500**	**63.44**
Oklahoma		**3,547,900**	

Sources: Office of Management and Budget and the Oklahoma Department of Commerce (ODOC)

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Table 2 shows the 16 Micropolitan Statistical Areas in Oklahoma and their counties and their percent of the state's estimated 2005 population. The population of the Micropolitan Statistical Areas comprises 21 percent of the state's population, while the Metropolitan and Micropolitan Statistical Areas together comprise 84 percent of the state's population.

Table 2. Oklahoma Micropolitan Statistical Areas and 2005 Estimated County Populations

Micropolitan Statistical Area	County	July 1, 2005 Estimated County Population	Percent of Oklahoma Population
Ada	Pontotoc	35,300	0.99
Altus	Jackson	26,500	0.75
Ardmore	Carter	47,100	
	Love	9,100	
Total		56,200	1.58
Bartlesville	Washington	49,100	1.38
Duncan	Stephens	42,900	1.21
Durant	Bryan	37,800	1.06
Elk City	Beckham	18,900	0.53
Enid	Garfield	57,000	1.60
Guymon	Texas	20,100	0.57
McAlester	Pittsburg	44,600	1.26
Miami	Ottawa	32,900	0.93
Muskogee	Muskogee	70,600	1.99
Ponca City	Kay	46,500	1.31
Shawnee	Pottawatomie	68,300	1.93
Stillwater	Payne	69,200	1.95
Tahlequah	Cherokee	44,700	1.26
Woodward	Woodward	19,100	0.54
Totals for all Micropolitan Statistical Areas		**739,700**	**20.84**
Oklahoma		**3,547,900**	

Sources: Office of Management and Budget and the ODOC

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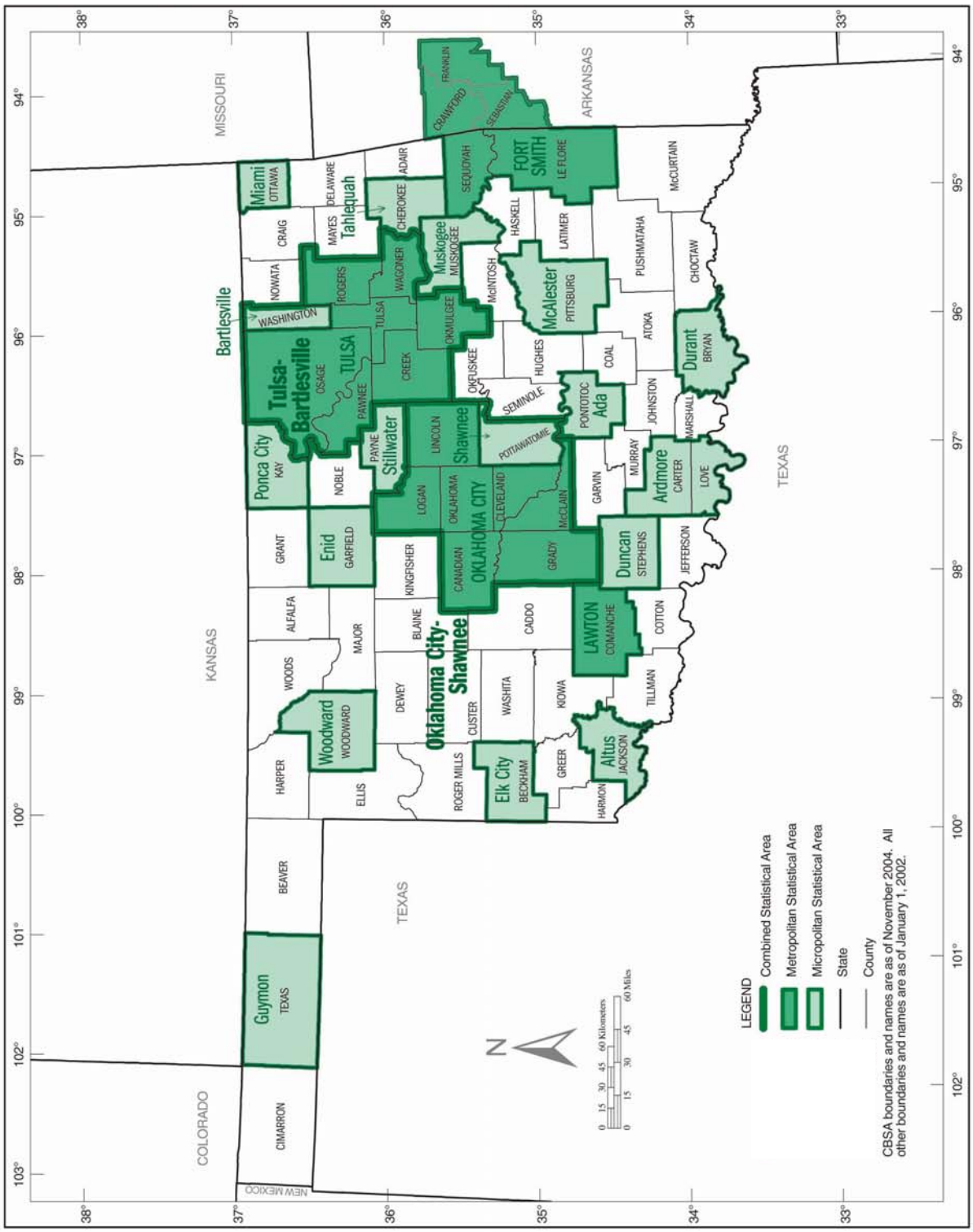

Figure 1. Oklahoma Core-Based Statistical Areas and Counties

The second criterion is that every Metropolitan Statistical Area and every Micropolitan Statistical Area be served by at least one Tier I airport.

Population Served

The service area for a regional business airport is defined as a 25-mile radius or 30 minutes ground travel time from the airport to the center of the local sustaining economy. The service areas for many of the regional business airports overlap the service areas of other regional business airports. This occurs whenever a regional business airport is located within 50 miles of another regional business airport. This overlapping of service areas makes the estimation of the population served by any single regional business airport somewhat arbitrary. The reality is that for most destinations, business travelers have a choice as to which regional business airport to use to get to their destination. Within the Oklahoma City and Tulsa Metropolitan Statistical Areas, this is highly desirable since a single airport could not meet the total aviation demand. This also means that most cities and communities are located closer to a regional business airport than 25 miles.

There are nine regional business airports that do not (as of January 2007) have runways of at least 5,000 feet. When the regional business airport system is developed to the desired minimum design standards, 96 percent of Oklahoma's population will be served by an airport with business jet capability.

All Metropolitan and Micropolitan Statistical Areas are served by at least one Tier I regional business airport. As shown in Tables 1 and 2, these Metropolitan and Micropolitan Statistical Areas comprise 84 percent of the state's population.

Aviation Demand Criteria

Forecasting future aviation demand is difficult as accurate information on the number of operations by business jet aircraft at non-towered airports is simply not available. Consequently, airport system planners use the number of based aircraft as a measure of the aviation demand at any particular airport. For most airports this measure works well, but there are exceptions. The exceptions are airports that have a high number of itinerant operations but few based aircraft.

Table 3 lists the 49 regional business airports in descending order of their total number of based fixed-wing aircraft. The number of single-engine piston-powered aircraft, multi-engine turboprop aircraft, and jet aircraft is also shown. The total number based fixed-wing aircraft serves as a measure of the aviation demand.

Another measure of aviation demand is the number of instrument operations by turboprop and turbojet aircraft. Table 3 also shows the number of instrument operations by turboprop and turbojet aircraft recorded by the FAA for calendar year 2005. This number of instrument operations is based on instrument flight plans filed to or from the listed airport. An operation is a takeoff or a landing. The pilot of a turboprop or turbojet aircraft typically will file an instrument flight plan because of the higher flight altitudes desired. All flight above 18,000 feet requires an instrument flight plan. The instrument flight plan data is the only source of information available on turboprop and turbojet aircraft operations at non-towered airports. This measure understates the importance of an instrument approach at the destination airport as the pilot may choose to

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cancel his instrument flight plan and make a visual flight rule (VFR) landing, weather permitting. In this case, the landing is not counted as an instrument landing even though most of the flight was made under instrument flight rules.

The airports with the higher number of turboprop and turbojet instrument operations are the airports with the higher number of total based aircraft and the higher number of based turboprop and turbojet aircraft. In 2005, 99.1 percent of the instrument operations by turboprop and turbojet aircraft occurred at a regional business airport. Only two airports, Grand Lake Regional and Chandler Municipal, which are not regional business airports, had a significant number of operations by turboprop and turbojet aircraft.

As the next section illustrates, the addition of a aviation demand criterion based on turboprop and turbojet operations would not change the recommended Tier I airport designations.

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Table 3. Regional Business Airports Ranked by Number of Based Fixed-Wing Aircraft

Airport Name	Number of Single-Engine Piston-Powered Aircraft	Number of Multi-Engine Turboprop Aircraft	Number of Turbojet Aircraft	Total Fixed-Wing Aircraft	Total Turboprop and Turbojet Instrument Operations
Tulsa-Richard L. Jones, Jr.	442	74	21	537	3,241
Oklahoma City-Wiley Post	316	56	39	411	7,512
Tulsa International	88	55	32	175	8,354
Guthrie-Edmond Regional	92	7	5	104	155
Enid Woodring Regional	79	19	3	101	722
Norman-Max Westheimer	63	24	4	91	1,619
Oklahoma City-Clarence E. Page	75	10	0	85	209
Stillwater Regional	72	6	1	79	1,073
Ponca City Regional	68	5	2	75	1,016
Oklahoma City-Will Rogers World	15	5	40	60	3,909
Grove Municipal	50	10	0	60	87
Sand Springs-William R. Pogue Municipal	51	8	0	59	73
Muskogee-Davis Field	43	16	0	59	705
Duncan-Halliburton Field	48	7	2	57	425
Claremore Regional	50	5	0	55	79
Durant-Eaker Field	50	4	1	55	420
Tahlequah Municipal	45	5	0	50	112
Ada Municipal	40	5	3	48	531

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Airport Name	Number of Single-Engine Piston-Powered Aircraft	Number of Multi-Engine Turboprop Aircraft	Number of Turbojet Aircraft	Total Fixed-Wing Aircraft	Total Turboprop and Turbojet Instrument Operations
Altus-Quartz Mountain Regional	38	6	0	44	192
McAlester Regional	40	4	0	44	497
Bartlesville Municipal	34	6	0	40	316
Lawton-Fort Sill Regional	30	7	3	40	365
Shawnee Regional	35	3	2	40	268
Ardmore-Downtown Executive	30	6	2	38	651
Seminole Municipal	35	2	1	38	33
El Reno Municipal	28	9	0	37	57
Guymon Municipal	29	7	0	36	344
Alva Regional	31	4	0	35	108
Chickasha Municipal	26	6	0	32	170
Pauls Valley Municipal	29	0	1	30	152
Weatherford-Thomas P. Stafford	25	5	0	30	13
Miami Municipal	22	7	0	29	140
Cushing Municipal	27	1	0	28	46
Woodward-West Woodward	27	1	0	28	227
Clinton Municipal	26	1	0	27	22
Poteau-Robert S. Kerr	25	1	0	26	32

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Airport Name	Number of Single-Engine Piston-Powered Aircraft	Number of Multi-Engine Turboprop Aircraft	Number of Turbojet Aircraft	Total Fixed-Wing Aircraft	Total Turboprop and Turbojet Instrument Operations
Sallisaw Municipal	21	4	0	25	59
Perry Municipal	21	2	1	24	44
Elk City Municipal	22	1	0	23	90
Pryor-Mid-America Industrial	21	1	0	22	60
Watonga Municipal	20	0	0	20	6
Okmulgee Regional	18	0	1	19	145
Idabel-McCurtain County Regional	10	8	0	18	486
Frederick Municipal	9	2	1	12	19
Blackwell-Tonkawa Municipal	10	0	0	10	4
Hobart Municipal	9	0	0	9	60
Hugo-Stan Stamper Municipal	7	0	0	7	23
Ardmore Municipal	4	1	0	5	467
Clinton-Sherman	0	0	0	0	348
Totals	**2,396**	**416**	**165**	**2,977**	**35,686**

Source: OAC and GCR & Associates, Inc. website http://www.gcr1.com

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The third criterion is that any regional business airport with 40 or more based aircraft be designated a Tier I airport.

Tier I and Tier II Airports

Based on the three criteria discussed previously – the airport type, the population served as designated by either a Metropolitan or a Micropolitan Statistical Area, or the total number of based aircraft – the Tier I and Tier II airports are divided into two groups: 29 Tier I and 20 Tier II airports.

Where more than one airport was located in a Metropolitan Statistical Area, the recommendation as to which airports to select as Tier I airports was based on the airport's location relative to the center of the statistical area's center of population and the aviation demand as measured by the number of based aircraft. Chickasha Municipal and El Reno Regional airports are located in the Oklahoma City Metropolitan Statistical Area; however, their number of based aircraft is less than 40. As the population of the Oklahoma City Metropolitan Statistical Area continues to grow, the future designation of these two airports as Tier I airports is anticipated. Similarly, the future designation of the Okmulgee Regional, Poteau-Robert S. Kerr, and Sallisaw Municipal airports as Tier I airports is anticipated. These airports are located in the Tulsa and Fort Smith Metropolitan Statistical Areas and have less than 40 based aircraft.

Where more than one regional business airport was located in a Micropolitan Statistical Area, only one was selected as a Tier 1 airport. Ardmore Municipal and Ardmore Downtown Executive airports are both in the Ardmore Micropolitan Statistical Area. Ardmore Municipal was selected as the Tier I airport because of its greater potential for future expansion of airside and landside facilities and the specialized activities that occur at this airport. Ponca City Regional and Blackwell-Tonkawa Municipal airports are both located in the Ponca City Micropolitan Statistical Area. The Ponca City Regional Airport was selected as the Tier I airport due to Ponca City's larger population size, the airport's designation as a non-primary commercial airport, the airport's greater number of based aircraft, and the airport's greater airside capability. The Stillwater Regional and Cushing Municipal airports are both located in the Stillwater Micropolitan Statistical Area. The Stillwater Regional Airport was selected as the Tier I airport due to Stillwater's larger population, the airport's greater number of based aircraft, and its greater airside capability. The Clinton-Sherman Airport was added to the Tier I group based on the specialized activities that occur there.

Not surprisingly, most of the designated Tier I airports met the Metropolitan or Micropolitan Statistical Area criterion and the number of based aircraft criterion, confirming that population concentration and the number of based aircraft are highly correlated. The Tier I airports have 96 percent of the jet aircraft and 83 percent of the total aircraft that are based at regional business airports. The Tier I airports have 94.5 percent of the turboprop and turbojet instrument operations that occur at regional business airports.

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Table 4 lists the Tier I airports and their associated system plan criteria, and Table 5 lists the Tier II airports and their associated system plan criteria.

Table 4. Tier I Regional Business Airports

Airport Name	Metro- or Micro Area Served	Total Based Aircraft	Additional Contributing Factors
Ada Municipal	Ada Micro.	48	• Primary runway 6,203 x 100 feet • S (400-1) to RW 17 and S (500-1) to RW 35 • AWOS-3 • Daily operations by based jet aircraft
Altus-Quartz Mountain Regional	Altus Micro.	44	• Primary runway 5,501 x 75 feet • S (500-1) to RW17 • AWOS-3 • Home to major U.S. Air Force base
Ardmore Municipal	Ardmore Micro.	5	• Primary runway 7,220 x 150 feet • S-ILS (200-¾) to RW 31 • Tower • Industrial airport • Significant number of itinerant operations by military and civilian C-III aircraft
Bartlesville Municipal	Bartlesville Micro.	40	• Primary runway 6,200 x 100 feet • S (600-1) to RW 17 and S (600-1) to RW 35 • ASOS • Daily jet operations by ConocoPhillips Corporation

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Airport Name	Metro- or Micro Area Served	Total Based Aircraft	Additional Contributing Factors
Claremore Regional	Tulsa Metro.	55	• Primary runway 5,200 x 75 feet • S (500-1) to RW 35 • AWOS-3
Clinton-Sherman	None	0	• Primary runway 13,503 x 150 feet • S-ILS (200-¾) to RW 17R and S (400-1) to RW 35 • ASOS • Tower • Industrial airport • Significant number of itinerant operations by military and civilian C-III aircraft • Proposed space port
Duncan-Halliburton Field	Duncan Micro.	57	• Primary runway 6,650 x 100 feet • S (700-1) to RW 17 and S (500-1) to RW 35 • AWOS 3 • Daily jet operations by Halliburton Corporation
Durant-Eaker Field	Durant Micro.	55	• Primary runway 5,001 x 100 feet • S (400-1 ¼) to RW 17 and S (400–1) to RW 35 • AWOS-3 • Significant flight-training operations
Elk City Municipal	Elk City Micro.	23	• Primary runway 5,400 x 75 feet • S (600-1 ½) to RW 17 and S (600-1) to RW 35 • AWOS-3

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Airport Name	Metro- or Micro Area Served	Total Based Aircraft	Additional Contributing Factors
Enid Woodring Regional	Enid Micro.	101	• Primary runway 6,389 x 150 feet • S (500-1) to RW 17 and S-ILS (200 ½) to RW 35 • Tower • AWOS-3 • FAR Part 139 • Non-primary commercial service
Fort Smith Regional Arkansas	Fort Smith Macro.	70	• Primary runway 8,000 x 150 feet • S-ILS (200 ½) RW 7 • S-ILS (200 ½) RW 25 • Tower • Automatic Terminal Information Service (ATIS) • Primary commercial service
Grove Municipal	None	60	• Primary runway 5,250 x 75 feet • S (500-1) to RW 18 and S (500-1) to RW 36 • AWOS-3 • Significant itinerant operations due to its location near Grand Lake of the Cherokees
Guthrie-Edmond Regional	Oklahoma City Metro.	104	• Primary runway 5,202 x 75 feet • S (400-1) to RW 16 and S (400-1) to RW 34 • ASOS
Guymon Municipal	Guymon Micro.	36	• Primary runway 5,900 x 100 feet • S (600-1) to RW 18 and S (500-1) to RW 36 • ASOS

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Airport Name	Metro- or Micro Area Served	Total Based Aircraft	Additional Contributing Factors
Lawton-Fort Sill Regional	Lawton Metro.	40	• Primary runway 8,599 x 150 feet • S-ILS (500-1/2) to RW 35 • ATIS • Tower • FAR Part 139 • Commercial service
McAlester Regional	McAlester Micro.	44	• Primary runway 5,602 x 100 feet • S-LOC (500-¾) to RW 1 and S (500-1) to RW 19 • ASOS • Provides access to a critical national defense industry
Miami Municipal	Miami Micro.	29	• Primary runway 5,020 x 100 feet • S (500-1) to RW 17 • ASOS
Muskogee-Davis Field	Muskogee Micro.	59	• Primary runway 7,200 x 150 feet • S (300-¾) to RW 31 • ASOS
Norman-Max Westheimer	Oklahoma City Metro.	91	• Primary runway 5,200 x 100 feet • S-ILS (200-¾) to RW 17 and S (700-1) to RW 35 and S-LOC (400- ¾) to RW 3 • AWOS-3 • Tower • Designated reliever airport to Will Rogers World Airport • Significant flight-training operations

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Airport Name	Metro- or Micro Area Served	Total Based Aircraft	Additional Contributing Factors
Oklahoma City-Clarence E. Page	Oklahoma City Metro.	85	• Primary runway 6,013 x 100 feet • S (5001) to RW 17R and S (500-1) to RW 35L • Significant flight-training operations
Oklahoma City-Will Rogers World	Oklahoma City Metro.	60	• Primary runway 9,802 x 150 feet • S-ILS (200-½) to RW 17 and S-ILS (200- ½) to RW 35R • ATIS • Tower • FAR Part 139 • Commercial service
Oklahoma City-Wiley Post	Oklahoma City Metro.	411	• Primary runway 7,198 x 150 feet • S-ILS (200-½) to RW 17L and S (500-1) to RW 35R • ATIS • Tower • Designated reliever to Will Rogers World Airport • Significant daily jet operations • Significant flight-training operations
Ponca City Regional	Ponca City Micro.	75	• Primary runway 7,201 x 150 feet • S-ILS (200-½) to RW 17 and S (500-1) to RW 35 • ASOS • FAR Part 139 • Non-primary commercial service

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Airport Name	Metro- or Micro Area Served	Total Based Aircraft	Additional Contributing Factors
Sand Springs-William R. Pogue Municipal	Tulsa Metro.	59	• Primary runway 5,800 x 100 feet • S (600-1) to RW 35 • AWOS-3 • Significant flight-training operations
Shawnee Regional	Shawnee Micro.	40	• Primary runway 5,600 x 100 feet • S-ILS (200-½) to RW 17 • AWOS-3 • Functions as a reliever to Will Rogers World Airport, although not designated as such • Significant flight-training operations.
Stillwater Regional	Stillwater Micro.	79	• Primary runway 7,402 x 100 feet • S-ILS (200-½) to RW 17 and S (400-1) to RW 35 • ASOS • Tower • FAR Part 139 • Frequent operations by C-III charter jets • Significant flight-training operations
Tahlequah Municipal	Tahlequah Micro.	50	• Primary runway 4,000 x 75 feet, extendable to 5,000 x 100 feet • S (500-1 ¾) to RW 17 and S (500-1 ¾) to RW 35 • AWOS-3

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Airport Name	Metro- or Micro Area Served	Total Based Aircraft	Additional Contributing Factors
Tulsa International	Tulsa Metro.	175	• Primary runway 10,000 x 200 feet • S-ILS (200-1/2) to RW 18L and S-ILS (200-½)) to RW 36R • ATIS • Tower • FAR Part 139 • Commercial service
Tulsa-Richard Lloyd Jones, Jr.	Tulsa Metro.	537	• Primary runway 5,102 x 100 feet • S-ILS (200- 3/4) to RW 1L • ATIS • Tower • Designated reliever to Tulsa International Airport • Significant daily jet operations • Significant flight-training operations
Woodward-West Woodward	Woodward Micro.	28	• Primary runway 5,502 x 100 feet • S (600-1) to RW 17 and S (600-1) to RW 35 • AWOS-3

Source: OAC Analysis and FAA U.S. Terminal Procedures effective June 8, 2006, to August 3, 2006
Notes:

- C-III: aircraft with approach speeds of 121 knots or more but less than 141 knots and wing spans of 79 feet up to but not including 118 feet
- ILS: Instrument Landing System
- LOC: Localizer
- Tower: Airport Traffic Control Tower
- FAR Part 139: Certification and Operations: Land Airports Serving Certain Air Carriers
- S (600-1): A non-precision straight-in instrument approach with a ceiling height of 600 feet and visibility minimums of one statute mile. The table lists the non-precision or precision approach with the lowest minimums to each end of the primary runway. If only one runway end is listed, there is not a non-precision approach to the other runway end.
- The Fort Smith (Ark.) Regional Airport serves Le Flore and Sequoyah counties

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Table 5. Tier II Regional Business Airports

Airport Name	Metro. or Micro. Area Served	Total Based Aircraft	Additional Contributing Factors
Alva Regional	None	35	• Primary runway 4,386 x 75 feet • S (600-1) RW 35 • AWOS-3
Ardmore Downtown Executive	Ardmore Micro.	38	• Primary runway 5,000 x 75 feet • S (500-1) RW 35 • AWOS-3
Blackwell-Tonkawa Municipal	Ponca City Micro.	10	• Primary runway 3,500 x 60 feet • S (600-1) RW 35
Chickasha Municipal	Oklahoma City Metro.	32	• Primary runway 5,000 x 100 feet • S (500-1) RW 35 • AWOS-3
Clinton Regional	None	27	• Primary runway 4,300 x 75 feet • RNAV (500-1) RW 17 • AWOS-3
Cushing Municipal	Stillwater Micro.	28	• Primary runway 5,201 x 100 feet • S (600-1) RW 36 • ASOS
El Reno Regional	Oklahoma City Metro.	37	• Primary runway 5,600 x 75 feet • S(400-1) RW 35 • AWOS-3
Frederick Municipal	None	12	• Primary runway 6,000 x 150 feet • S (400-1) RW 35L • ASOS
Hobart Municipal	None	9	• Primary runway 5,507 x 100 feet • S(500-1) RW 35 • ASOS
Hugo-Stan Stamper Municipal	None	7	• Primary runway 3,400 x 75 feet • S (700-1) RW 35 • AWOS-3

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Airport Name	Metro. or Micro. Area Served	Total Based Aircraft	Additional Contributing Factors
Idabel-McCurtain County Regional	None	18	• Primary runway 5,000 x 75 feet • RNAV (500-1) RW 20 • AWOS-3
Okmulgee Regional	Tulsa Metro.	19	• Primary runway 5,150 x 100 feet • ILS (200-1/2) RW 18 • AWOS-3
Pauls Valley Municipal	None	30	• Primary runway 5,000 x 100 feet • RNAV (400-1) RW 35 • AWOS-3
Perry Municipal	None	24	• Primary runway 5,098 x 75 feet • S (500-1) RW 17
Poteau-Robert S. Kerr	Ft. Smith Metro.	26	• Primary runway 4,006 x 75 feet • RNAV (500-1) RW 36 • AWOS-3
Pryor Creek-Mid-America Industrial	None	22	• Primary runway 5,000 x 75 feet • C (1,400 x 1¼)
Sallisaw Municipal	Ft. Smith Metro.	25	• Primary runway 4,000 x 75 feet • RNAV (700-1) RW 35 • AWOS-3
Seminole Municipal	None	38	• Primary runway 5,000 x 75 feet • RNAV (500-1) RW 16 • AWOS-3
Watonga Regional	None	20	• Primary runway 4,000 x 75 feet • S (600-1) RW 17 • AWOS-3
Weatherford-Thomas P. Stafford	None	30	• Primary runway 4,400 x 75 feet • S (500-1) RW 17 • AWOS-3

Source: OAC Analysis and FAA U.S. Terminal Procedures effective June 8, 2006, to August 3, 2006

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Tier I Airport Performance Measures

Introduction

The characteristics of a regional business airport were previously presented. The criteria for a regional business airport are described in terms of airport system planning criteria, sponsor criteria, demand criteria, services criteria, airports planning criteria, and airports geometric criteria. These regional business airport characteristics and criteria remain unchanged from the criteria identified in the OASP. What then is the significance to the planning and programming process of the regional business airport Tier I and Tier II designations? Clearly, the expectations of Tier I airports are higher due to their greater contribution to the Oklahoma airport system. How are these greater expectations to be measured? These greater expectations are discussed in this section. More is expected from the Tier I airport sponsors and greater weight will be given to the Tier I airports during the programming process. In actuality, an examination of the Commission's programming process clearly shows that the Tier I airports are, and have been, receiving greater attention during the programming process than have the Tier II airports.

Desired Characteristics of a Tier I Airport

For the most part, these greater expectations for a Tier I airport are one of degree. (In the following discussion, Ardmore Municipal and the Clinton-Sherman airports are exceptions.) The Tier I airports serve multiple communities, communities with populations of 5,000 or more, and county populations of 10,000 or more. All Tier I airports:

- Serve major employers.
- Have community sponsors that have demonstrated their financial capability and interest to continue to develop, maintain, and operate their airport.
- Have on site airport management.
- Have aviation gasoline and Jet A fuel available.
- Have some aircraft repair services.
- Have a terminal building.
- Have at least a straight-in non-precision instrument approach to one runway end.
- Have terminal weather capability.

The expectation is that Tier I airport sponsors have the ability to provide a higher level of service than do the sponsors of Tier II airports. The expectations are that the condition of the marking and signage will be better; the maintenance of the apron, taxiways, and runway paving will be more aggressive; the appearance of the public parking and terminal building will be more attractive; and the maintenance and mowing of the safety areas will be more frequent. In short, the Tier I airports will look better and more professional.

Desired Approach Minimums

From the perspective of the pilot flying a business jet for his or her corporate flight department, the most important consideration for the destination airport is the runway length. Arguably, the second most-important consideration is the instrument approach minimums at the destination airport. The minimum design standard for a regional business airport is a non-precision approach with a 600-foot ceiling height and one statute mile visibility minimums or better. All the 29 Tier

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I regional business airports have approach minimums to at least one runway end that meet this minimum standard.

Improving the instrument approach minimums is a complex process that depends on numerous factors, only some of which are within the control of the airport sponsor. The objective is to improve the approach minimums at Tier I regional business airports so that the visibility minimums are less than one statute mile and the ceiling height minimums are 300 feet or less. Further, given the advancements in technology, specifically the Wide Area Augmentation System (WAAS), it is desired that Tier I regional business airports have at least one instrument approach with vertical guidance.

WAAS is defined as "an extremely accurate navigation system developed for civil aviation. Before WAAS, the U.S. National Airspace System (NAS) did not have the ability to provide horizontal and vertical navigation for precision approach operations for all users at all locations. With WAAS, this capability is becoming a reality. WAAS provides service for all classes of aircraft in all flight operations, including en-route navigation, airport departures, and airport arrivals. This includes precision landing approaches in all weather conditions at all locations throughout the NAS."

WAAS has not been implemented at the rate originally expected by the FAA. The first approaches with vertical guidance (APV) using WAAS technology are being designed for selected Oklahoma airports. During the next decade, it is expected that APV approaches will be widely implemented in Oklahoma.

The general requirements for an approach procedure with vertical guidance with Required Navigation Performance (APV-RNP) are found in AC 150/5300-13 CHG 8 Appendix 16, Table A16-1B. Table 7 summarizes these requirements for approaches with less than one statute mile visibility and 300 feet height above touchdown.

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Table 7. Approach Procedure with Vertical Guidance Approach Requirements (APV-RNP)

Visibility Minimums	**< One statute mile**	**Visibility minimums are subject to the application of FAA Order 8260.3 (Terminal Instrument Procedures [TERPS])**
Height Above Touchdown (HAT)	300 feet	Actual HAT is determined by TERPS.
TERPS Glidepath Qualification Surface (GQS)	Clear	The intent is to provide a decent path from the decision altitude to landing free of obstructions that could destabilize the established glide path course.
TERPS Paragraph 251	20:1 clear	
Precision Obstacle Free Zone (POFZ) 200 x 800	Recommended	The POFZ is defined as a volume of airspace above an area beginning at the runway threshold, at the runway elevation, and centered on the extended runway centerline, 200 feet long by 800 feet wide.
Airport Layout Plan (ALP)	Required	The ALP must show the desired approach.
Minimum Runway Length	3,200 feet paved	
Runway Markings	Non-Precision Precision Recommended	
Holding Position Signs and Markings	Non-Precision Precision Recommended	
Runway Edge Lights	High Intensity Runway Lights (HIRL)/Medium Runway Intensity Lights (MIRL)	MIRL required for night minimums. HIRL required for RVR minimums.
Parallel Taxiway	Required	A parallel taxiway must lead to the threshold and, with airplanes on centerline, keep the airplanes outside the Obstacle Free Zone (OFZ).
Approach Lights	Required	ODALS, MALS, SSALS are acceptable.
Runway Design Standards	APV OFZ Required	For aircraft over 12,500 pounds, the OFZ is 400 feet wide.
Runway End Siting Criteria Met	Refer to AC 150/5300-13 Chg.10, Table A2-1	The table contains guidance on siting thresholds to meet approach obstacle clearance requirements and departure obstacle clearance requirements.

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Visibility Minimums	**< One statute mile**	**Visibility minimums are subject to the application of FAA Order 8260.3 (Terminal Instrument Procedures [TERPS])**
Survey Required for Lowest Minima	Non-precision with Vertical Guidance ≥ ¾ statute mile	Runway survey types: • D: FAR77 Non-precision –Visibility minimums as low as ¾ mile includes approach and primary surfaces only. • ANAPC: Area Navigation Approach – Precision, conventional landing, includes approach, primary, transition, and missed approach surfaces. • PIR: FAR 77 Precision Instrument Approach – includes approach and primary surfaces only.

Source: FAA AC 150/5300-13 Change 10, September 29, 2006
Notes:

- APV: Approach Procedure with Vertical Guidance
- RNP: Required Navigation Performance

Many of the Tier I airports do not meet all the requirements in Table 7. Most Tier I airports do have non-precision markings and signage and the required taxiway, but do not have an ALP reflecting an APV approach with less than one statute mile visibility minimums, the desired precision markings and signage, an approach lighting system, or the required surveys performed.

In addition to the requirements in Table 7, other runway design changes will be required due to lowering the approach minimums from one statute mile to less than one statue mile. For example, for the desired approach visibility minimums, the size of the required runway protection zone for aircraft approach category A and B increases from about 14 acres to 49 acres and for aircraft approach category C and D from about 30 acres to about 49 acres. The runway protection zone is a defined area of land off each runway end to enhance the protection of people and property on the ground. Airport sponsors are encouraged to own the property under the runway approach and departure areas to at least the runway protection zones. It is desirable to clear the entire runway protection of all aboveground objects.

Implementing these desired approach minimums at the Tier I regional business airports is an ambitious and highly desirable goal.

The FAA goal is to establish 300 WAAS-based approaches nationally in 2007 and 2008. Some of these will be at Oklahoma airports. An approach procedure with vertical guidance is expected to be published for Ardmore Municipal, Bartlesville Municipal, and Will Rogers World airports in 2007. In 2008 an approach procedure with vertical guidance is expected to be published for Ada Municipal, Altus-Quartz Mountain Regional, El Reno Regional, Elk City Municipal, Grove Municipal, Guthrie-Edmond Regional, Guymon Municipal, Tahlequah Municipal, and West Woodward.

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Desired Terminal Weather Capabilities

All of the proposed Tier I airports have terminal weather capabilities either through the ATIS or from an AWOS III. It is desirable to upgrade the AWOS III units to AWOS IV units by the addition of runway surface condition sensors. The surface condition sensor alerts the pilot to ice or water on the runway. Ice or water on the runway significantly increases the aircraft stopping distance.

Desired Visual Approach Aids

It is desired that all Tier I regional business airports provide visual guidance aids such as Runway-End Identification Lights (REILs) and Precision Approach Path Indicators (PAPIs) on both ends of the primary runway unless an approach lighting system is installed.

Desired Taxiway Geometrics

A basic airport consists of a runway with a full parallel taxiway, an apron, and connecting transverse taxiways between the runway, parallel taxiway, and the apron. Several Tier I airports, some former Army Air Corps pilot training fields, have taxiways constructed by the Army Corps of Engineers during World War II that do not conform to today's taxiway geometric standards. The activity levels at these airports are such that it is highly desirable that the non-standard taxiways be reconstructed to current standards. In most cases, this requires that two diagonal taxiways be replaced with a single parallel taxiway and one or more transverse connecting taxiways.

Desired Terminal Capabilities

For most business travelers arriving by air, the public terminal building is their first stop. The terminal building serves several functions. Additionally, the terminal building provides the visitor with his or her first impression of the community. For many travelers, the terminal building is the airport. The Tier I airports have a terminal building that serves the basic functions but most do not have terminal buildings that make an excellent first impression. Although most of the structures are sound, their interiors are dated, reflecting architectural styling of the 1960s. Consequently, most are in need of a face lift or modernization project.

Desired Hangar Capabilities

One primary advantage of a business jet is that it allows the user to fly to his or her destination, conduct their business, and return to his or her home location all in the same day. However, business cannot always be conducted in one day. On those occasions, the business jet user will want their plane stored in a hangar. There is nothing like a May thunderstorm with impeded hail or a February cold front with ice and snow to negate all the benefits of a business jet. Additionally, aircraft security is a concern at a regional business airport that is not attended 24/7. In short, it is desired that Tier I regional business airports have a hangar with the capability to house one or more itinerant business jets.

Recommendation

It is recommended that the OASP be amended by dividing the 49 regional business airports into two groups: 29 Tier I airports and 20 Tier II airports. In general, a Tier I regional business airport will be expected to provide, across the board, a higher level of capabilities and services than will be expected of a Tier II regional business airport. In addition, a Tier I airport will be expected to

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provide an approach with vertical guidance (APV) with visibility minimums of less than one statute mile and ceiling height minimums of 300 feet or less, an AWOS IV or equivalent, visual approach aids (PAPI and REILS) on both ends of the primary runway, standard taxiway geometrics, a modern terminal building, and a storage hangar of sufficient size to store one or more itinerant business jets. The achievement of these expectations for a Tier I airport will require a dedicated airport sponsor and capital funding assistance from the FAA and OAC.

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