

Appendix A-1: Criteria Used to Categorize General Aviation Airports

INTRODUCTION

The 2,952 facilities (2,903 airports, 10 heliports, and 39 seaplane bases) largely serving general aviation in the Federal Aviation Administration’s (FAA) National Plan of Integrated Airport Systems (NPIAS) fulfill a broad range of aeronautical functions. These landing facilities, most of which are airports, are referred to in this report as general aviation airports. Congress, over time, has defined two classes of airports that serve mostly general aviation: those that also support limited commercial service and those that help relieve congestion at primary airports. A third definition “General Aviation Airports” was created in the FAA Modernization and Reform Act of 2012. These statutory definitions are shown in Table A-1.

Table A-1: Statutory Definitions of General Aviation Airports

<p>Nonprimary commercial service airports (121) are publically owned airports with scheduled air carrier service and annual passenger boardings between 2,500 and 10,000.</p> <p>Reliever airports (268) are high activity general aviation airports that provide general aviation with alternatives to congested hubs (where their presence might cause additional delay).</p> <p>General aviation airports (2,563) are defined as public airports in a state that have at least 2,500 passenger boardings each year and is receiving scheduled passenger aircraft service.</p>

These definitions, however, are inadequate to properly describe the critical roles of these general aviation airports. For instance, some general aviation airports have significantly more operations than do some primary (more than 10,000 enplanements and scheduled service) commercial service airports, and although some general aviation airports do draw general aviation operations away from busy primary airports, many “reliever” airports primarily serve other aeronautical functions.

The criteria for setting the categories for general aviation airports were refined throughout the process, incorporating the primary research that was conducted in creating the database for this work program and the results of extensive outreach. We also conducted tests for consistency to be sure that the criteria used did not disadvantage a particular type of airport or airports in a certain geographic area. The remainder of this appendix provides details on the creation of the four categories of general aviation airports.

THE ANALYSIS AND CRITERIA USED TO DEFINE THE SYSTEM

In cooperation with the greater aviation community, the FAA conducted a 19-month review of 2,952 landing facilities. An important objective was to develop a new way to define general aviation airports, heliports, and seaplane bases using activity and other data in existing federal databases. Furthermore, the analysis had to be repeatable every few years. Analysis based on other local, statewide or site specific data will continue to be assessed as part of statewide system planning, metropolitan system planning, and master planning for individual airports.

Coordination With Various Stakeholders

A significant effort was made to coordinate the study process and preliminary results with a variety of stakeholders. The first aviation industry workshop was held on January 6-7, 2011, and was sponsored by the Transportation Research Board (TRB). The TRB gathered together a small group of individuals representing many different perspectives within the aviation industry.

As a result of the first workshop, the team began to consider how airports could be grouped together. The FAA team developed written descriptions for potential new categories and began identifying data related to each description. The data were tested to determine if they helped in dividing airports into the new categories.

The challenge was determining what criteria could be used to describe these categories. Furthermore, the data had to be easily accessible, reliable, and reproducible. This information was discussed with other FAA organizations outside of the Office of Airports, as well as with many of the stakeholders.

A second industry workshop was held on June 30, 2011. The proposed general aviation airport categories, descriptions, and the criteria associated with them were unveiled. Many of the same participants from the first workshop were at this second workshop along with organizations that were unable to attend the first workshop. In addition, several Federal Agencies that provide critical services that use airports were asked to participate. Three agencies were able to send representatives: the U.S. Forest Service, U.S. Postal Service, and Essential Air Service.

Representatives from four other agencies were not able to attend: Federal Emergency Management Agency, U.S. Customs and Border Protection, U.S. Department of Defense, and the U.S. Marshals Service. These agencies did, however, provide valuable input.

Coordination with the study stakeholders continued throughout the study process through teleconferences, webinars, and face-to-face meetings. The following is a partial list of industry participants as well as others involved throughout the study:

- Airlines for America
- Aircraft Owners and Pilots Association
- Airport Consultants Council
- Airports Council International-North America

- Alliance for Aviation Across America
- American Association of Airport Executives
- Experimental Aircraft Association
- General Aviation Airport Coalition
- General Aviation Manufacturers Association
- National Business Aviation Association
- National Association of State Aviation Officials
- National Air Transportation Association
- Regional Airline Association
- Alabama Department of Transportation
- Missouri Department of Transportation
- Oklahoma Aeronautics Commission
- Wisconsin Department of Transportation

Setting the Criteria

The process to group the general aviation airports into more descriptive categories included a review of state aviation system plans. Even though state interests are more narrowly focused, the state plans provided useful insights into how one might distinguish among general aviation airports. Table A-2 summarizes the criteria for supporting airports in selected states.

Table A-2: Examples of How Selected States Classify Their Airports

<u>Arizona</u>	<u>Arkansas</u>	<u>Georgia</u>	<u>Maine</u>	<u>Nevada</u>
Inventories all airports within their system, using the following criteria:	Evaluates and groups airports based on:	Groups airports into three categories based on the following criteria:	Assigns airports to four roles based on the following criteria:	Uses the following criteria to categorize their airports:
<ul style="list-style-type: none"> • Airside facilities • Landside facilities • Airport plans • Activity • Airspace • Navigational aids and approach types • Development constraints 	<ul style="list-style-type: none"> • Aircraft type • Primary role • Navaids • Approach type • Runway and taxiway characteristics 	<ul style="list-style-type: none"> • Runway length • Runway width • Taxiways • Lighting systems • Approach • NAVAIDs • Weather reporting • Hangars • Terminals • Fuel • FBO 	<ul style="list-style-type: none"> • Accessibility • Tourism support • Economic contribution • Present demand • Historic investment • Geographic coverage 	<ul style="list-style-type: none"> • Based aircraft • Enplanements or operations • Serves a reliever role • Population served

Not surprisingly, the various states used different criteria to categorize their airports; nevertheless, there were some similarities. The most common criteria used by the states were runway length, runway approach, weather reporting, and lighting. Understandably, individual states used different standards within each of these categories depending on the characteristics unique to each state. For instance, airports located at higher elevations or in climates with high temperatures typically required longer runway lengths. Similarly, airports located in areas prone to low visibility required more precise runway approaches and better weather reporting and lighting.

The FAA team found that the criteria were so diverse across the 50 states and four territories that it was not possible to group the 2,952 general aviation airports using criteria based on state aviation system plans. For instance, the length of runway is very important to the type and size of aircraft using a specific airport, but it does not mean that there is a common minimum length required to meet a specific aeronautical function. Moreover, other factors (such as the variability of wind direction, climate, altitude, and surrounding terrain) affect runway length. Similarly, a control tower is not necessarily needed for an airport to serve a specific aeronautical function.

The FAA team recognized that it was the level and types of activity, geographical indicators, and other current uses as well as community services provided by Government agencies that distinguished the airports. For example, runway length, approach, weather reporting, and lighting are all related to the types and sophistication of the aircraft using the airport, and the types and sophistication of aircraft that use an airport are related to aeronautical functions that an airport supports. Several combinations of data elements were assessed, including levels of activity, types of infrastructure, geographic location, and existing community services provided by Government agencies and ownership. Tables A-3 through A-6 provide examples of the criteria considered when establishing the new general aviation airport categories. The description for each show whether the criterion was used to create the final categories.

**Table A-3: Types of Activity Indicators Considered in Grouping
General Aviation Airports**

Activity Indicators	Used in Final Categorization of General Aviation Airports.
IFR Flights	Yes , the number and type of aircraft operations is an important indicator of an airport's role. Flights operating under IFRs must file a flight plan and include data such as the originating and terminating airport and type of aircraft. There is no such requirement for aircraft operating under visual flight rules (VFR). Therefore, the number of IFR operations not only provides an estimate of activity, but is also indicative of the type and sophistication of the aircraft using an airport.
Based Jets	Yes , the number of jets based at an airport provides important information about an airport's role and its economic connection to a geographic area. Jets are generally used in connection with business activity and are flown long distances. The number of based jets implies a higher cost of travel and a greater need to use a particular airport having appropriate infrastructure.
Based Aircraft	Yes , based aircraft (including helicopters) is a measure of the size of the airport and the activity it provides in support of a community or region.
Enplanements	Yes , the number of revenue passengers using an airport is an important indicator of an airport's role. Passengers buying tickets on a commercial air carrier or chartering aircraft are choosing to use a particular airport based on its location and commercial services offered.
Total Distance Flown	No , the total distance flown was calculated for IFR flights. However, the total distance flown varied significantly based on the number of flights, types of aircraft, and markets served. Three related criteria did work: number of international flights, the number of interstate flights, and the number of flights longer than 500 nautical miles.
IFR International Flights	Yes , flights to international destinations are an important indicator of the markets, or geographical area, served by a particular general aviation airport, especially when combined with other criteria, such as the types of based aircraft and the number of IFR flights.
IFR Interstate Flights	Yes , interstate flights provide an important indicator of the market and geographical area served by a particular general aviation airport.
IFR 500 Mile Radius Flights	Yes , flights over 500 nautical miles from the originating airport provided useful information about the geographical area served by a general aviation airport.
Cargo Landed Weight	Yes , the tonnage of cargo handled is an important indicator of an airport's role. However, only a few general aviation airports recorded landed cargo weight of any significance.

Table A-4: Airport Infrastructure Considered in Grouping General Aviation Airports

Airport Infrastructure	Used in Final Categorization of General Aviation Airports.
Jet Fuel	No , in most cases, but not always, the availability of jet fuel was related to whether or not jet aircraft were based at an airport. Therefore, jet aircraft based at a general aviation airport was seen as a more consistent and better criterion.
Avgas	No , the availability of aviation gasoline was inconsistent throughout the population of general aviation airports; therefore, it was not used to categorize the airports.
Runway Length	No , although the length of a runway is very important to the type and size of aircraft using a specific airport, it doesn't mean that there is a common minimum length required to meet a specific aeronautical function. Therefore, this criterion was not used to categorize the airports.
Instrument Approach	No , although instrument approaches are an important factor in accessing an airport, the availability, need for, and precision of instrument approaches varied considerably across the different general aviation airports. The need for, and precision of, an instrument approach is more directly related to local metrological conditions and frequency of use rather than the aeronautical functions served by the airport. Therefore, the level of IFR activity was seen as a more consistent criterion to help categorize the general aviation airports than instrument approaches.
Airport Traffic Control Tower	No , like runway length and instrument approaches, the availability of a control tower is important and needed at some airports. However, control towers are not required at most general aviation airports. The need and justification for a control tower are related to the level of activity and local airspace and safety concerns, not the aeronautical function served by an airport. Therefore, the presence of a control tower at an airport was not used to categorize the general aviation airports.

Table A-5: Geographical Indicators Considered in Grouping General Aviation Airports

Geographical Indicators	Used in Final Categorization of General Aviation Airports.
Catchment Area Income	No , a catchment area is defined by the population closest to an airport; total income within that area is a function of the number of other NPIAS airports nearby and may or may not reflect the kinds of aeronautical activities taking place at an airport.
Catchment Area Population	No , a catchment area is defined by the population closest to an airport; total population within that area is a function of the number of other NPIAS airports nearby and may or may not reflect the kinds of aeronautical activities taking place at an airport.
Metropolitan or Micropolitan Statistical Area	Yes , the presence of an airport in a metropolitan area makes it more likely that the airport supports business activity or is a reliever for a major commercial airport.
Remote Location/Access	Yes , some communities are not served by roads or have no year-round transportation connection except by air. These airports typically serve more remote areas and fulfill important societal needs, such as providing access to aeromedical services and other communities.
Nearest NPIAS Airport	Yes , when distances increase beyond 30 miles, it becomes more likely that the airport will be used for access to a remote community

Table A-6: Ownership and Other Data Considered in Grouping General Aviation Airports

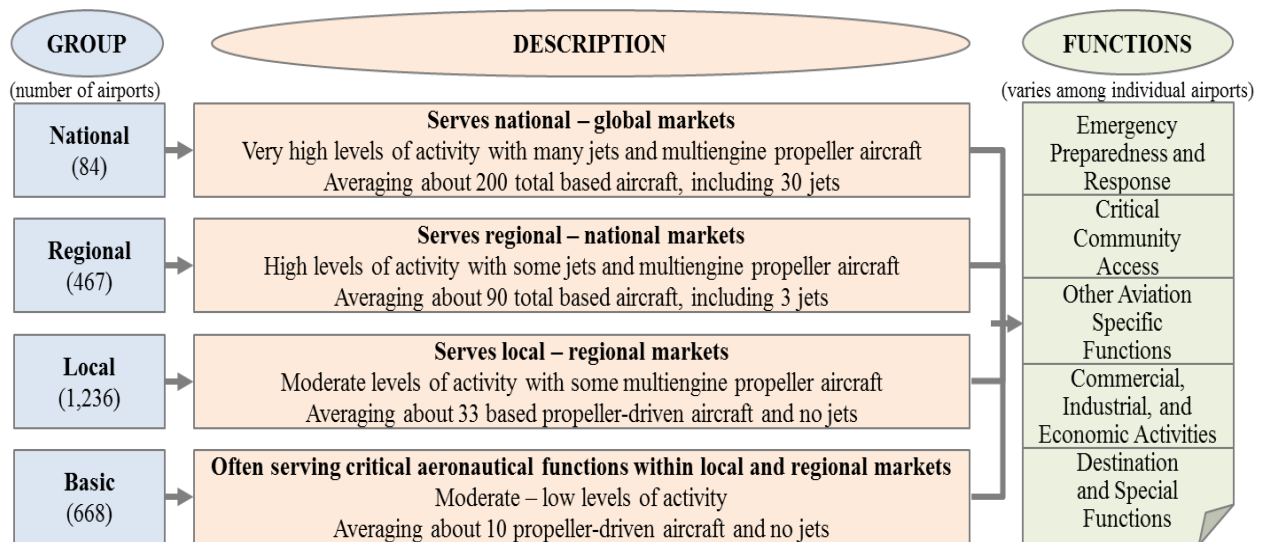
Ownership and Other Data	Used in Final Categorization of General Aviation Airports.
Commercial Service	Yes , because the availability of commercial service indicates a higher level of demand and business activity. Also, current statutes require that such airports be included in the NPIAS.
Part 139 Certification	No , because this certification is not typically required at general aviation airports.
Public Interest Supported by Government Agencies	Yes , many airports support the public interest by providing communities with access to critical functions provided by Government agencies. For example, fire fighting (U.S. Forest Service); law enforcement (U.S. Marshals Service and U.S. Customs and Border Protection); freight and mail service to remote areas (U.S. Postal Service); and scheduled air service (Essential Air Service).
New or Replacement Airport	Yes , a new federally funded airport opened after January 1, 2001. Since 2000, aviation has dealt with the impacts of 9/11, record high fuel prices, and a serious economic downturn. Airports that have opened during this time may not have reached their projected activity levels.
Ownership	Yes , to be in the NPIAS and eligible for Federal funding, an airport must be either a publically owned airport or a privately owned airport designated as a reliever with 100 based aircraft.

The New Categories and the Final Criteria

Based on the analysis of the criteria and data shown in the figures above, four new general aviation airport categories were developed: national, regional, local, and basic. Of the 2,952 general aviation airports studied, 2,455 were assigned to one of the four new categories. We could not establish a clearly defined category for 497 airports. They have different types of activity and characteristics and cannot readily be described. These 497 airports are currently not classified and require further study.

The criteria used to create these new categories reflect the markets and aeronautical functions served by the various general aviation airports in the NPIAS and currently eligible for Federal funding. Figure A-1 shows the four new categories, provides a general description of each, and lists examples of the aeronautical functions served by our nation’s general aviation airports. The following pages provide a definition and the criteria for each new airport category developed.

Figure A-1: New General Aviation Airport Categories



National Airports:

<p>National airports support the national and state system by providing communities with access to national and international markets. They accommodate a full range of aviation activity, including large corporate jet and multi-engine aircraft operations, significant charter passenger services, or all-cargo operations. They often work in conjunction with, and in support of, hub airports serving the aviation needs of larger metropolitan areas. Some 84 general aviation airports meet the following criteria and have been designated national airports:</p>	
1	The airport has at least 5,000 annual IFR operations, at least 11 based jets, at least 20 annual international departures, or at least 1,000 annual interstate operations; or
2	The airport has at least 10,000 annual enplanements and at least one enplanement in the large air carrier category; or
3	The airport has at least 500 million pounds of annual landed cargo weight.

Regional Airports:

<p>Regional airports support regional economies by connecting communities to statewide and interstate markets. These airports accommodate a full range of regional and local business activities, limited scheduled passenger service, or cargo operations. They serve corporate jet and multi-engine aircraft, as well as single-engine propeller aircraft. Some 467 general aviation airports meet the following criteria and have been designated regional airports:</p>	
1	The airport is located in a metropolitan or micropolitan statistical area, has at least 10 annual domestic IFR flights over 500 miles in radius, at least 1,000 annual IFR operations, at least one based jet, or at least 100 based aircraft; or
2	The airport is located in a metropolitan or micropolitan statistical area, and the airport meets the definition of commercial service.

Local Airports:

<p>Local airports supplement communities by providing access to primarily intrastate and some interstate markets. These airports accommodate small businesses, flight training, emergency service, charter passenger service, cargo operations, and personal flying activities. They typically accommodate smaller general aviation aircraft, mostly single-engine propeller and some multi-engine aircraft. Some 1,236 general aviation airports meet the following criteria and have been designated local airports:</p>	
1	The airport has at least 10 annual IFR operations and at least 15 based aircraft; or
2	The airport has at least 2,500 annual passenger enplanements.

Basic Airports:

Basic airports support general aviation activities such as emergency service, charter or critical passenger service, cargo operations, flight training, and personal flying. These airports typically accommodate mostly single-engine propeller aircraft. They may be located in, and provide service to, remote areas of the United States with limited or no surface transportation options, and therefore may be critical to the transportation of goods required for local day-to-day life. Some 668 general aviation airports meet the following criteria and have been designated basic airports:

- 1 The airport has at least 10 based aircraft; or
- 2 Is a heliport with at least four based helicopters; or
- 3 The airport is a facility identified and used by either the U.S. Forest Service, U.S. Marshals Service, U.S. Customs and Border Protection (designated, international, or landing rights), U.S. Postal Service (air stops), or has Essential Air Service; or
- 4 The airport is a new or replacement airport activated after January 1, 2001; or
- 5 The airport is considered remote access (nearest NPIAS airport is at least 30 miles away) or is identified in a state aviation system plan as remote access or equivalent; and
Must be publically owned or privately owned and designated as a reliever with a minimum of 90 based aircraft.

Data Sources

Data used to categorize the airports were obtained from the following sources:

MSA, U.S. Census Data: Source – American Community Survey Data; values generated summer of 2011. The U.S. Census Bureau assigns the MSA designation of “metro” or “micro” to counties in the United States if they find population clusters of more than 10,000. The criterion includes both designations. The 2009 American Community Survey Data (U.S. Census Bureau) was the source for the MSA designations. The airports’ MSA designations were generated in the summer of 2011 using geographic information system software to find the county for the airport and then pulling the county MSA designation, if it had one, for each airport.

IFR Operations: Source – FAA’s Aircraft Situation Display to Industry (ASDI), 2009. The study uses both arrival and departure IFR data from Calendar Year 2009 using data collated by GCR and Associates, Inc., from the IFR flight plans in the ASDI data feed. Only flights that left the ground are included in the counts. Flight plans that are cancelled after takeoff or never closed are still counted as a departure.

Based Aircraft, Based Jets, Based Helicopters: Source – FAA’s National Flight Data Center (NFDC) 5010 data, July 2010.

International Flights: Source – FAA’s/Enhanced Traffic Management System (ETMS) data for Calendar Year 2009 (collated spring of 2011). The 2009 flight data that originated with the FAA (ETMS) were analyzed by GRA, Incorporated¹. An international flight occurs when either the origin or destination is outside of the United States or its territories.

¹ GRA, Incorporated provides strategic aviation advisory services and economic analysis.

IFR Interstate Operations: Source – FAA’s Aircraft Situation Display to Industry (ASDI), 2009. This is a subset of the IFR operations discussed earlier and it includes both arrivals and departures. A slight difference exists for this from the earlier IFR operations data in that a valid arrival airport (“actual” arrival airport, not “planned” airport) is required to determine whether the flight was out-of-state or not.

Enplanements and Deplanements by Large Air Carrier: Source – FAA’s System of Airports Reporting (SOAR) for Calendar Year 2010. SOAR uses enplanement and cargo data extracted from the Air Carrier Activity Information System, an FAA database that contains revenue passenger boarding and all-cargo data.

Landed Cargo Weight: Source – FAA’s System of Airports Reporting (SOAR) for Calendar Year 2010. These data come from SOAR’s list of airports that qualified for cargo entitlements in Fiscal Year 2012 based on Calendar Year 2010 activity.

500-Mile Radius Domestic Flights: Source – FAA’s Aircraft Situation Display to Industry (ASDI), 2009. The ASDI subsystem of the Traffic Flow Management System allows near real-time air traffic data to be disseminated. This data is a subset of the IFR operations data. Both departure and arrival data are included. Airport latitude and longitudes for all airports in the NFDC data set in 2009 are used to calculate the distances between airports; therefore, only flights between domestic airports are included in these data.

Commercial Service: Source – FAA’s System of Airports Reporting (SOAR) as of November 2011 based on Calendar Year 2010 passenger activity data.

Airports Used/Designated by U.S. Forest Service: Source – U.S. Forest Service – spring 2011.

Airports Used/Designated by U.S. Marshals Service: Source – U.S. Marshals Service – spring 2011.

Airports Used/Designated by U.S. Customs and Border Protection: Source – “Guide for Private Flyers” – data classifies airports by designated, international, landing rights, or user fee. The first three (designated, international, and landing rights) airports were used in this analysis.

Airports Served Under Essential Air Service: Source – U.S. Department of Transportation (DOT) May 2011.

U.S. Postal Service (air stops): Source – U.S. Postal Service – spring 2011. An air stop is an airport designated by the U.S. Post Office as a location where mail is delivered. It may only be a runway and person that picks up that mail. There is no correlation between an air stop and the location of a Post Office. These are mostly used for airports located in Alaska.

Remote Access: Collated fall of 2011. Includes the airports in Alaska’s State Aviation System Plan role of “Off-Road” and selected airports from other states that also provide the only year-round transportation access.

Nearest NPIAS Airport: Source – FAA/GCR² October 2010. The statute mileages were computed between all NPIAS airports, regardless of the service levels of either airport. Mileage between airports is calculated using the NFDC’s airport reference point's latitude and longitude for each airport.

How the Final Criteria Were Set for Each Category

The process used to establish which criteria to use was an iterative one. The FAA Team’s objective was to create categories that reflect real differences among airports. This same philosophy was applied to setting the levels for individual data elements.

For example, the criterion “based jets” was used to distinguish between National and Regional airports. Why use “based jets” as a criterion for these two categories? Earlier in Table A-3, the FAA Team argues that the presence of jets distinguished the types of commercial activity supported by an airport, and also the types of infrastructure that may be required. Most based jets are located at national or regional airports. Only 10 percent of the total fleet based at NPIAS general aviation airports is at local, basic, or not classified airports. To be useful in distinguishing national from regional airports, the average number of “based jets” in the national category should be significantly higher than the number in the regional category. That threshold was set at 11 based jets.

It would also be useful if the criterion distinguished a category from an adjacent category even if that criterion was not used in the adjacent category. An example of this would be if the average number of “based jets” was higher at regional airports than at local airports.

This approach was applied to the activity criteria used to create the categories. Some criteria that had relatively sparse data (not many airports) were excluded, including cargo operations. We also did not test the remote access or Federal service criteria, because these are minimum criteria to be included in the four categories and either an airport qualified or it did not.

To conduct the test, the team calculated the average for each criterion for each category of airport and also calculated the standard deviation for each criterion. So for example, in each category, the FAA team calculated the average number of based aircraft and the standard deviation of based aircraft within that category. The FAA team applied a standard t-test to calculate the probability that the data for a criterion came from the same population when comparing two categories. So, a very low probability means that the airports in one category are different from those in another; i.e., for that criterion they came from different populations.

To visualize what this test does, consider Figure A-2, which is an illustration for data for a criterion (e.g., Based Aircraft) for two airport categories. If the data for a criterion do not overlap very much or not at all, then one can conclude that they are indeed different at least in that dimension. The area in red illustrates a case where the overlap is very small and thus the probability that the two categories came from the same population is small.

² GCR Incorporated is an international professional services firm, partners with government and commercial clients to deliver consulting services and technology solutions in aviation, disaster recovery, elections, nuclear power, public safety, right-of-way, and urban planning.

Figure A-2: Illustration for a Criterion (e.g., Based Aircraft) for Two Airport Categories

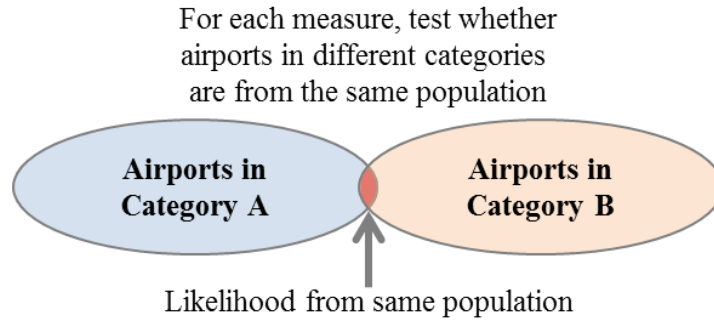


Table A-7 shows the activity measures that were used to separate one category from another. Each criterion was tested separately using paired comparisons between categories. The FAA Team found that the categories are different for all of the main activity criteria used to categorize airports. Specifically, except for enplanements, the probability that airports in different categories came from the same populations is less than 1 percent for the criteria shown in the figure. For enplanements, the probabilities are still low, between 2 and 10 percent.

Table A-7: Summary of t-Tests Undertaken

Category	Based Jets	Based Aircraft	Enplanements	IFR Flights	IFR Flights >500 Miles	International Flights	Interstate Flights
National	Less than 1%	Less than 1%	2%	Less than 1%	Less than 1%	Less than 1%	Less than 1%
Regional	Less than 1%	Less than 1%	2%	Less than 1%	Less than 1%	Less than 1%	Less than 1%
Local	Less than 1%	Less than 1%	10%	Less than 1%	Less than 1%	Less than 1%	Less than 1%
Basic		Less than 1%					

A low probability means that the airports in one category are different from those in another; i.e., for that criterion, they came from different populations of airports and therefore are a good criterion to categorize the airports.

The results of these statistical tests allow us to conclude that the criteria were set appropriately; i.e., that they make distinctions between airport categories that are statistically significant and that the airports come from different populations.

The tests reported in Table A-7 are done one criterion at a time. When criteria are combined to create the categories, the likelihood that airports in different categories come from different populations increases. For example, among the criteria that distinguish national from regional airports are “based jets” and IFR operations. Table A-7 shows that the likelihood that the two categories came from the same population is less than 1 percent for each criterion separately. Now, to illustrate why the categories are more likely to be from different populations when considering more than one criterion at a time, suppose we assume that the two criteria are independent of one another and that the probability that they came from same population is 1 percent for each criterion. Using this assumption, the joint probability that the two categories

came from the same population is 1% x 1% or 0.01%. Thus, by combining the criteria, the FAA Team ensured that airports in each category really are different.³

Tests for Consistency

Another issue examined by the ASSET team related to the selective application of criteria across categories. The same criteria were not used in each category. An airport was assigned to the highest category (from national to not classified) for which it qualified. But, the Team wanted to make sure that the application of the criteria was consistent and did not disadvantage one type of airport from another.

The ASSET team therefore developed a statistical test reported later in Appendix A. The test applied all of the criteria to each airport using a regression equation. The result was that each airport was given an “estimated” category (from the regression), which was then compared to the category assigned by the ASSET team using the criteria as described in key findings from the New General Aviation Airport Categories, later in Appendix A-2. The ASSET team found that the regression assigned the same category 97 percent of the time.

The ASSET team then looked at each of the “exceptions” – the airports where the regression disagreed with the categories. The ASSET team reviewed the underlying data and made updates in many cases. The data were retested and the ASSET team was able to conclude that each airport was consistently allocated to a category. Furthermore, there was no apparent bias in the allocation – that is, no group of airports seemed to be disadvantaged or advantaged by the final criteria selected.

FINAL CATEGORIES

Appendix A also provides more details on the four new categories: national, regional, local, and basic. There are relatively sharp distinctions in activity and the types of activity among the categories. These distinctions will make it easier for the Federal Government, states, regions, and other stakeholders to understand the future needs of these airports, while recognizing that the mix of aeronautical functions at airports within categories varies.

Using the criteria described above, we were able to place 2,455 NPIAS locations in the four clearly defined categories. We could not establish a clearly defined category for the remaining 497 NPIAS airports. These airports will need further review, and we will continue to work with the aviation community to assess and potentially categorize these airports in the future.

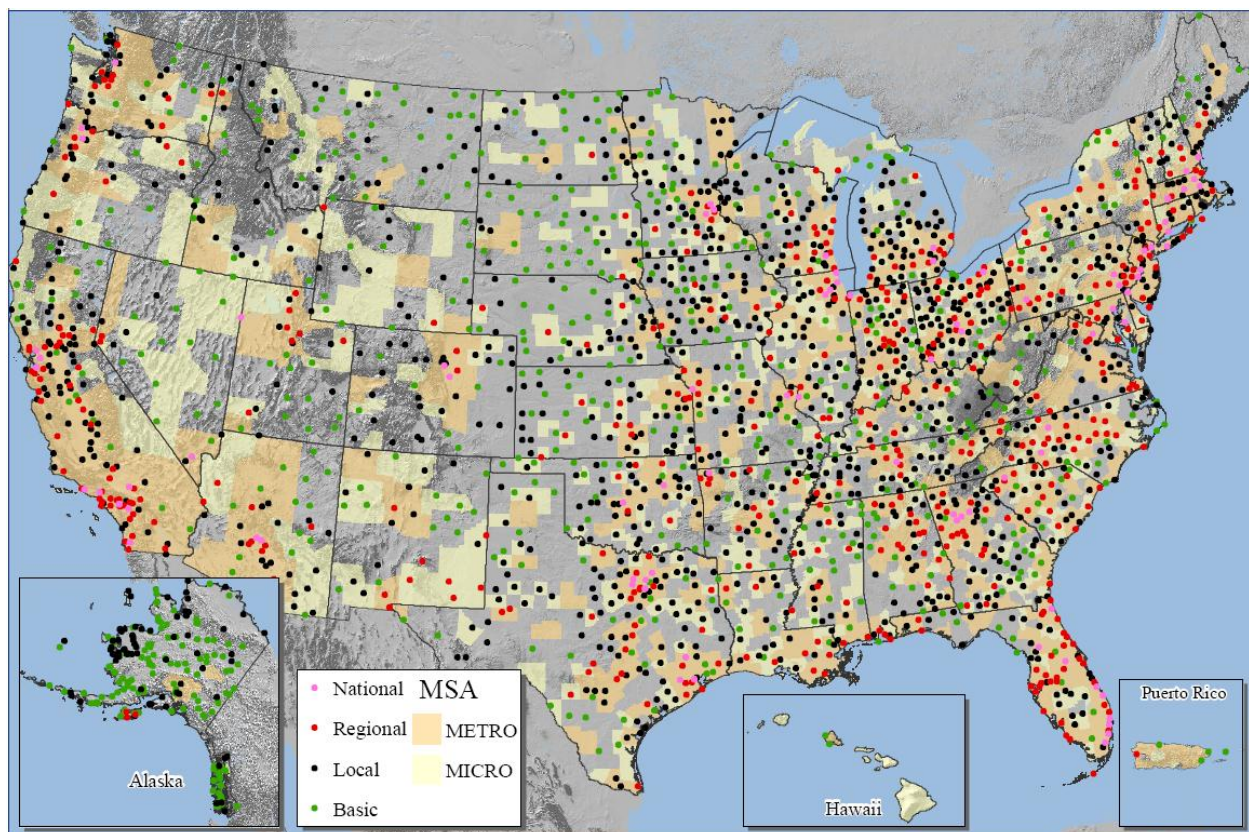
³ The FAA recognizes that some criteria (e.g., based jets and IFR operations) may not be independent; still, tests of the individual criteria suggest that adjacent categories came from different populations.

Appendix A-2: Key Findings from New General Aviation Airport Categories

The FAA's new categories for general aviation airports make relatively sharp distinctions among them, based primarily on activity measures. The following pages describe typical airports in each category, including summary data and quick overviews of representative airports. The current statutory designations (commercial service, reliever, general aviation) are reported by new categories as well. Also reported are data on airport participation in the Airport Improvement Program (AIP) and nonprimary entitlements (NPE).

The information on the characteristics that distinguish airports in different categories measures the size and activity at airports. The data did not capture all of the rich detail of the many aeronautical functions undertaken by airports in all of the categories.

Map of the General Aviation Airports in the Four Categories



National Airports



National Airports

- Operations throughout the United States and to foreign countries with some intercontinental flights
- Base and often service very sophisticated aircraft
- Typically in metropolitan areas
- Serve business and corporate users
- Often provide an alternative to private operations at congested hub airports



NATIONAL AIRPORTS

The 84 national airports are located in metropolitan areas near major business centers and support flying throughout the nation and the world. National airports are currently located within 31 states. They account for 13 percent of total flying at the studied general aviation airports and 35 percent of all flights that filed flight plans at the airports in the four new categories. These 84 airports support operations by the most sophisticated aircraft in the general aviation fleet. The most prominent flying is by jet aircraft, including corporate and fractional ownership operations, and air taxi services. These airports also provide pilots with an attractive alternative to often busy primary commercial service airports. There are no heliport or seaplane bases in this category.

- A typical national airport has nonstop departures to foreign points, including flights to Asia, Europe, or Central and South America.
- All of the national airports supported air ambulance flights in 2009, meaning that at least one departure was conducted to transfer a patient to another location.
- 66 airports are designated as reliever airports. Most, but not all of these airports divert general aviation traffic away from major hub airports, preserving limited capacity for commercial air traffic.
- 45 airports support critical community services provided by Government agencies (law enforcement, U.S. Marshals Service, U.S. Postal Service, U.S. Customs and Border Protection and/or U.S. Forest Services, and Essential Air Service).
- None have scheduled commercial service, but 48 were used by large certificated air carriers for charter flights.
- Operators spend over \$50 million per year flying at the average national airport, which typically base over 200 aircraft and over 30 jets.
- \$1.2 billion of AIP funds was invested at national airports during the period 2001-2009. Recognizing that not all airports received AIP funds every year, and therefore averages can be imbalanced (or slanted), the \$1.2 billion represents a simple annual average of \$1,610,297 per airport, including \$89,734 in NPE funds and \$1,520,563 in discretionary funds. Naturally, the size and nature of capital investments varied greatly among airports within the category

Table A-8 provides an alignment of existing categories with the proposed national airports and other notable characteristics:

- None of the national airports are designated as commercial service (airports that enplane at least 2,500, but fewer than 10,000, passengers)

Table A-8: Alignment of Existing Categories With National Airports and Other Characteristics

Existing Category	National Airports
Commercial Service Airport	0
Designated Reliever Airport	66
General Aviation Airport	18
Total	84
Other Characteristics (included in Total)	
Seaplane Bases	0
Heliports	0
Federal Role EAS Airports	0
Federal Role U.S. Customs and Border Protection	42
Federal Role U.S. Forest Service	2
Federal Role U.S. Postal Service (air stops)	0
Federal Role U.S. Marshals Service	9
At Least One Federal Role	45

Table A-9 presents the criteria used to create all of the new general aviation categories and the average value for each criterion for national airports. The colors represent alternative groups of criteria that, when satisfied, qualify an airport to be in the national category. The yellow shaded items represent a case where an airport needs to satisfy at least one of the criteria.

- Criteria (light blue and yellow):
 - 5,000 or more annual IFR operations (flights with a filed flight plan and usually under active control by FAA air traffic controllers);
 - 11 or more based jet aircraft at the airport; and
 - 20 or more international IFR departures or at least 1,000 interstate IFR departures
- Criteria (light green): At least 10,000 enplanements and at least one enplanement by a large air carrier
- Criteria (light orange): At least 500 million pounds of air cargo enplaned

Table A-9: National Airports (84) Data for Criteria

Category	Definitions	National	Criteria Used for National Category
Average Annual IFR Departures	Number of IFR departures reported in FAA ETMS data	19,165	5,000 or more
Average Based Jets	Number of based jet aircraft reported in basedaircraft.com	41	11 or more
Average Annual Enplanements	Revenue passengers that board a scheduled or unscheduled flight at a landing facility (airport, heliport, seaplane base)	2,920	10,000 or more
Number of Airports With Large Carrier Enplanements	Revenue passengers that board a scheduled or unscheduled flight operated by a large certificated air carrier (defined in part 241 of title 14 Code of Federal Regulations)	48	at least 1
Average Annual IFR Interstate Departures	Number of IFR departures reported in FAA ETMS data	11,424	1,000 or more
Average Number of IFR International Departures	Number of IFR departures reported in FAA ETMS data	789	20 or more
Number of Airports With Cargo lbs. >500 Million/Year	Total annual landed weight in pounds of aircraft providing scheduled or unscheduled cargo-only service at an airport	2	500M pounds
Average Based Aircraft	Number of based aircraft reported in basedaircraft.com	274	
Average Number of IFR Departures Over 500 Miles	Number of IFR departures reported in FAA ETMS flown over 500 miles	4,378	
Number of Airports in Micro or Metro Areas	Number of airports in micro (core city) or metropolitan (regional) statistical areas as identified by the U.S. Office of Management and Budget	84	
Commercial Service	Airports that enplane more than 2,500 but less than 10,000 passengers	0	
Number of Remote Airports	Nearest NPIAS airport more than 30 miles or identified in state plans as providing remote access	0	
Number of Airports With Critical Community Services	Number of airports providing access to U.S. Forest Service, U.S. Marshals Service, U.S. Customs and Border Protection, U.S. Postal Service (air stop), or Essential Air Service	45	
Number of Airports Activated After 1/1/2001	FAA records show airports opened after 1/1/2001	0	
Number of Privately Owned Airports	Number of airports held by private entities	0	
Relievers	Airports designated as relievers in the NPIAS	66	
Number of Private Relievers With Less Than 90 Based Aircraft	Airports designated as relievers in the NPIAS that are privately owned and have fewer than 90 based aircraft	0	
Number of Private Relievers With More Than 90 Based Aircraft	Airports designated as relievers in the NPIAS that are privately owned and have more than 90 based aircraft	0	
Number of Private General Aviation Airports	A private airport in the NPIAS that is not primary, commercial service, or a reliever	0	
Special Circumstance Airports With Prior Agreements	Airports entered into the NPIAS for special reasons	0	

Most national airports qualified under the criteria of average based jets and average annual IFR departures. The average national airport far exceeds the minimum requirement for each of these criteria. Only a few airports qualify based on passenger enplanements, while Rickenbacker International Airport in Ohio qualified based on the amount of air cargo enplaned.

Figure A-3 shows the location of the 84 national airports, which are concentrated in large urban areas. Figure A-4 provides a summary of data describing, and profile of, one national airport: Barnes Municipal Airport in Massachusetts.

Figure A-3: Location of National Airports

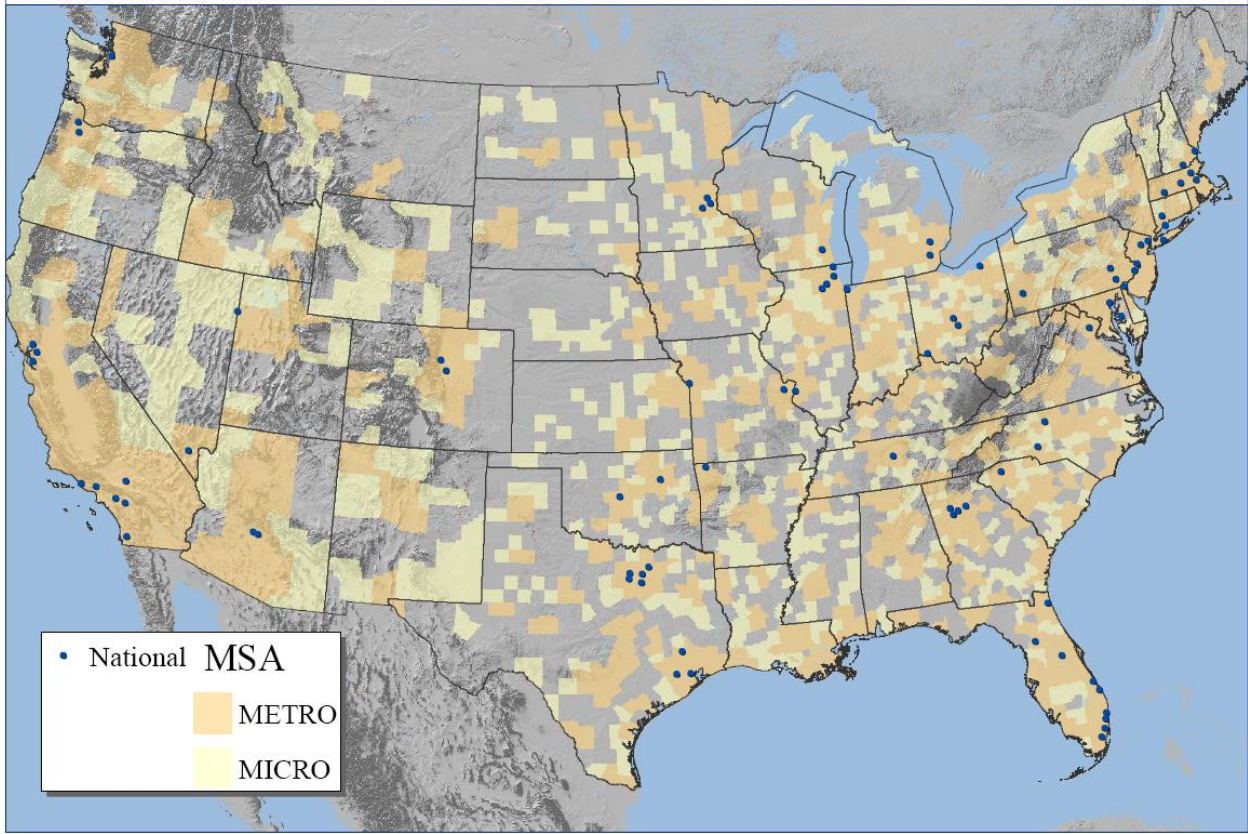
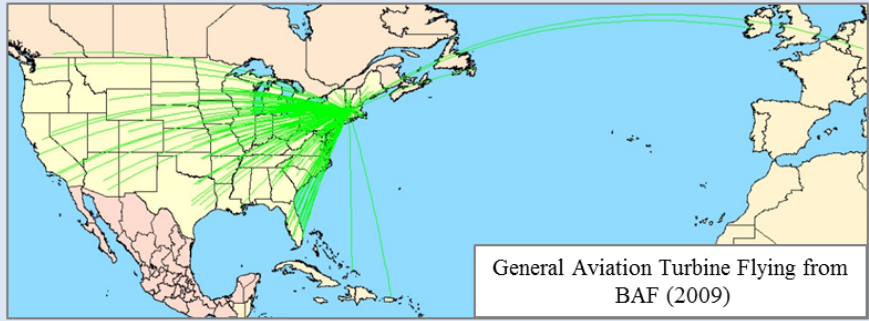


Figure A-4: Profile of National Airport

Profile: National Airport Serving National and Global Markets

Barnes Municipal Airport (BAF) is a public airport located 3 miles north of the central business district of Westfield, a city in Hampden County, Massachusetts. BAF is one of Massachusetts' largest airports, with a strong flight training, general aviation, and military presence. With two runways, BAF handles over 55,000 aircraft annually, averaging 152 daily operations (the vast majority of which were transient and local general aviation flights).







As of May 2011, there were 120 based aircraft at BAF, 100 of which are single-engine aircraft. The facilities at the airport include a conference center, fueling center, and an aircraft service center that is currently being expanded. The airport also hosts two fixed-base operators.



The airport is able to provide services not easily replicated at primary airports. It is an important military base and home to the 104th Fighter Wing of the Massachusetts National Guard. BAF is also home to a large aircraft completion and maintenance center.

The map shows general aviation turbine destinations flown IFR from BAF in FY 2009. The pattern is consistent with its designation as a national airport, with flights throughout the nation and overseas.

The table shows that general aviation activity dominated activity in FY 2009, comprising 95 percent of all flights. General aviation piston activity was the leader in aircraft operating costs, followed closely by general aviation turbine activity and military activity.

Barnes Municipal Airport		Shares - FY 2009	
		Aircraft Operating Costs	Flights
Fractional Ownership Programs		5%	1%
Nonscheduled Part 135 Passenger		8%	2%
General Aviation – Turbine		30%	4%
General Aviation – Piston		31%	89%
Government/Military		24%	2%
Air Ambulance		1%	0%
Other		1%	2%
Total		99%	100%

Regional Airports



Watsonville Municipal Airport
Watsonville, California

Regional Airports

- Operations across state lines, but typically within the region. Some national and international flying
- Jet and turboprop flying is prominent
- Always in a metropolitan area
- Many times will be the location of commercial services with smaller aircraft



REGIONAL AIRPORTS

The 467 regional airports are located in metropolitan areas and serve relatively large populations. These airports support interstate and some long distance (cross country) flying with more sophisticated aircraft. Forty-nine states currently have regional airports with the exception of Hawaii. They account for 37 percent of total flying at the studied general aviation airports and 42 percent of flying with flight plans. There is a substantial amount of charter (air taxi), jet flying, and rotorcraft flights at regional airports. There are no heliport or seaplane bases in this category.

- 459 regional airports supported air ambulance services in 2009.
- 108 fulfilled a critical community service provided by Government agencies (law enforcement, U.S. Postal Service, U.S. Customs and Border Protection and/or U.S. Forest Service, and Essential Air Service).
- 51 have limited scheduled air service that boarded more than 2,500, but less than 10,000, passengers in 2010.
- 137 are designated as reliever airports.
- 90 were used by large certificated air carriers for charter flights.
- 56 receive scheduled air service through the Essential Air Service Program.
- Operators spend over \$10 million per year flying at the average regional airport.
- The typical regional airport has more than 90 aircraft based at the airport with a few jets.
- \$2.4 billion of AIP funds was invested at the regional airports during the period 2001-2009. Recognizing that not all airports received AIP funds every year, and therefore averages can be imbalanced (or slanted), the \$2.4 billion represents a simple annual average of \$575,016 per airport, including \$90,520 in NPE funds and \$484,497 in discretionary funds. Naturally, the size and nature of capital investments varied greatly among airports within the category

Table A-10 provides an alignment of existing categories with the proposed regional airports and other notable characteristics:

- The table also breaks out the Federal roles played by these airports; 56 are designated for Essential Air Service; U.S. Customs and Border Protection operates at 43 at these airports; the U.S. Forest Service designates 19 of these airports as fire fighting stations; there are no U.S. Postal Service airports, and no airports are designated for operations by the U.S. Marshals Service.

Table A-10: Alignment of Existing Categories With Regional Airports and Other Characteristics

Existing Category	Regional Airports
Commercial Service Airport	51
Designated Reliever Airport	137
General Aviation Airport	279
Total	467
Other Characteristics (Included in Total)	
Seaplane Bases	0
Heliports	0
Federal Role Essential Air Service Airports	56
Federal Role U.S. Customs and Border Protection	43
Federal Role U.S. Forest Service	19
Federal Role U.S. Postal Service (air stops)	0
Federal Role U.S. Marshals Service	0
At Least One Federal Role	108

Table A-11 presents the criteria used to create all of the new general aviation categories and the average value for each criterion for Regional airports. The colors represent alternative groups of criteria that, when satisfied, qualify an airport to be in the Regional category. The yellow shaded items represent a case where an airport needs to satisfy at least one of the criteria.

- Criteria (light blue and yellow):
 - Located in a micropolitan or MSA;
 - 10 or more annual domestic IFR flights over 500 miles;
 - 1,000 or more IFR departures; and
 - One based jet or 100 or more based aircraft
- Criteria (light green): Located in an MSA and designated as a commercial service airport

Most airports in the regional category qualified under average annual IFR departures, average number of IFR departures over 500 miles, and number of airports in micro or metro (light blue). Forty-five airports qualified because they are designated as Commercial Service and are located in an MSA. There are 12 privately owned relievers with more than 90 based aircraft that also qualify.

Table A-11: Regional Airports (467) Data for Criteria

Category	Definitions	Regional	Criteria Used for Regional Category
Average Annual IFR Departures	Number of IFR departures reported in FAA ETMS data	3,992	1,000 or more
Average Based Jets	Number of based jet aircraft reported in basedaircraft.com	3	one or more
Average Annual Enplanements	Revenue passengers that board a scheduled or unscheduled flight at a landing facility (airport, heliport, seaplane base)	1,006	
Number of Airports With Large Carrier Enplanements	Revenue passengers that board a scheduled or unscheduled flight operated by a large certificated air carrier (defined in part 241 of title 14 Code of Federal Regulations)	90	
Average Annual IFR Interstate Departures	Number of IFR departures reported in FAA ETMS data	1,886	
Average Number of IFR International Departures	Number of IFR departures reported in FAA ETMS data	39	
Number of Airports With Cargo lbs. >500 Million/Year	Total annual landed weight in pounds of aircraft providing scheduled or unscheduled cargo-only service at an airport	0	
Average Based Aircraft	Number of based aircraft reported in basedaircraft.com	105	100 or more
Average Number of IFR Departures Over 500 Miles	Number of IFR departures reported in FAA ETMS flown over 500 miles	465	10 or more Domestic
Number of Airports in Micro or Metro Areas	Number of airports in micro (core city) or metropolitan (regional) statistical areas as identified by the U.S. Office of Management and Budget	467	Micro or Metro
Commercial Service	Airports that enplane more than 2,500, but less than 10,000, passengers	51	Yes
Number of Remote Airports	Nearest NPIAS airport more than 30 miles or identified in state plans as providing remote access	3	
Number of Airports With Critical Community Services	Number of airports providing access to U.S. Forest Service, U.S. Marshals Service, U.S. Customs and Border Protection, U.S. Postal Service (air stops), or Essential Air Service	108	
Number of Airports Activated After 1/1/2001	FAA records show airports opened after 1/1/2001	1	
Number of Privately Owned Airports	Number of airports held by private entities	12	
Relievers	Airports designated as relievers in the NPIAS	137	
Number of Private Relievers With Less Than 90 Based Aircraft	Airports designated as relievers in the NPIAS that are privately owned and have fewer than 90 based aircraft	0	
Number of Private Relievers With More Than 90 Based Aircraft	Airports designated as relievers in the NPIAS that are privately owned and have more than 90 based aircraft	12	
Number of Private General Aviation Airports	A private airport in the NPIAS that is not primary, commercial service, or a reliever	0	
Special Circumstance Airports With Prior Agreements	Airports entered into the NPIAS for special reasons	0	

Figure A-5 shows the locations of the 467 regional airports, all of which are located in MSAs. Figure A-6 provides a profile and summary data describing one regional airport: Lebanon Municipal Airport in western New Hampshire.

Figure A-5: Location of Regional Airports

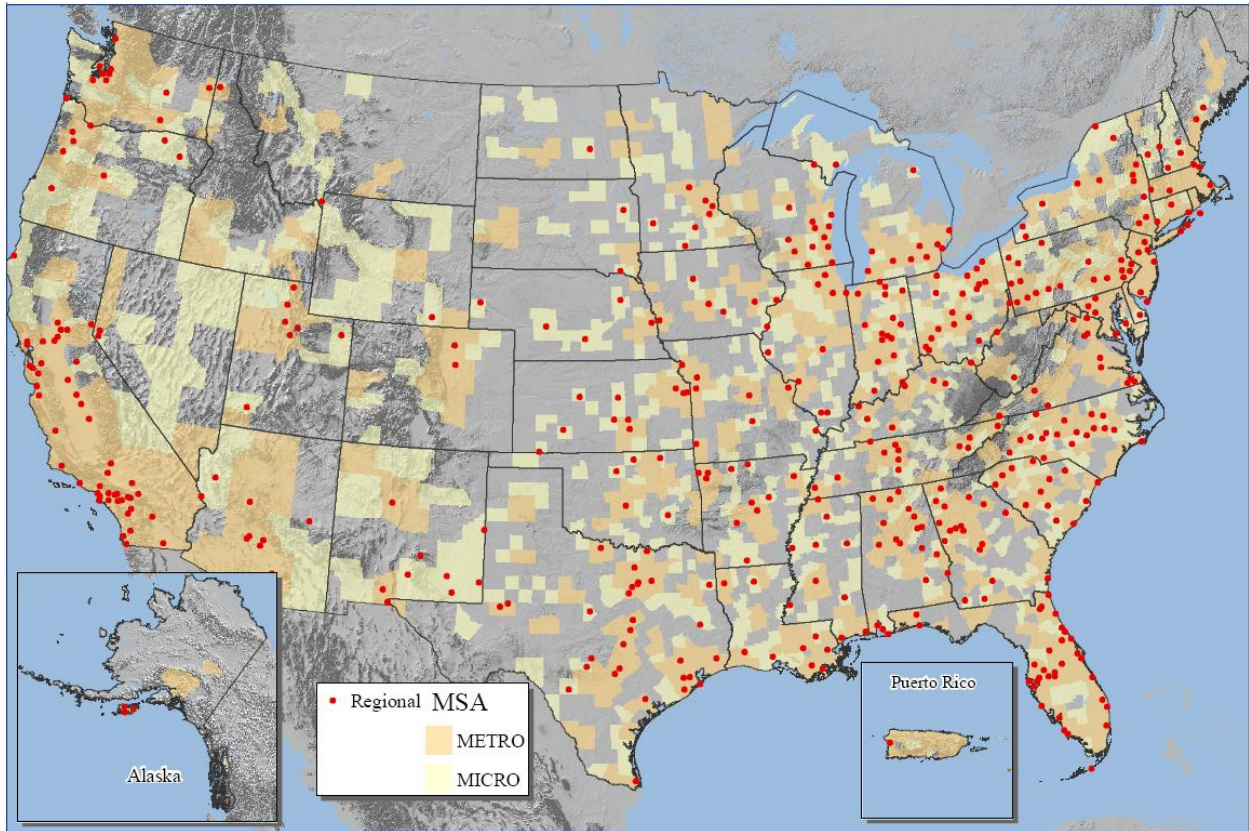


Figure A-6: Profile of Regional Airport

Profile: Regional Airport Serving Regional and National Markets










Lebanon Municipal Airport (LEB) is a public airport located in West Lebanon, New Hampshire, 3 miles west of the central business district of Lebanon, a city in Grafton County, New Hampshire. Daily commercial service from LEB connects passengers to Boston and White Plains, New York. The airport has two runways and handles over 39,000 operations annually, averaging 108 operations per day. The majority of operations at the airport are general aviation flights, with some air taxi and military operations. As of April 2011, there were a total of 51 based aircraft at LEB, 33 of which are fixed wing while the remaining 18 are helicopters. The majority of the fixed wing based aircraft are single engine.



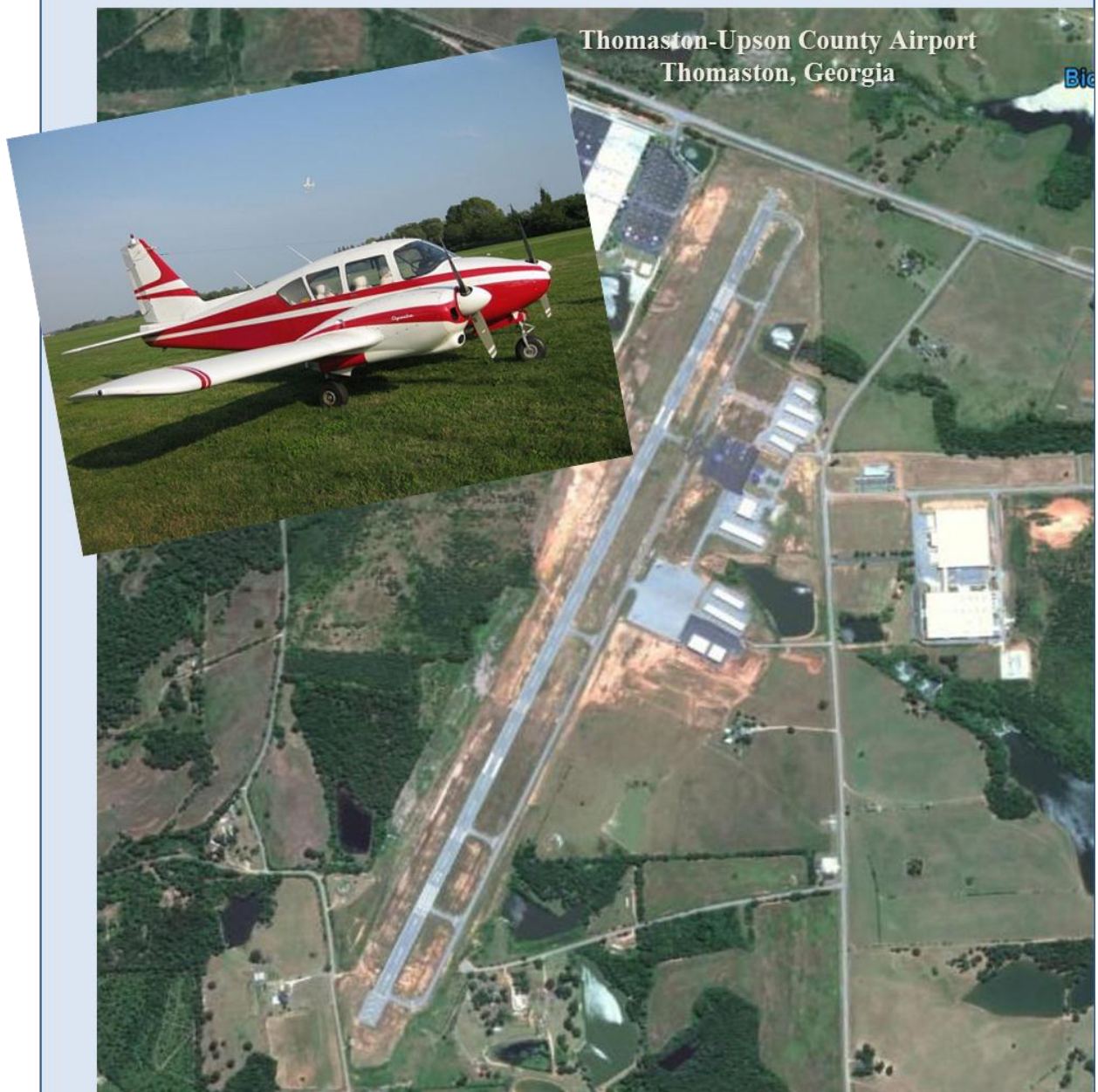
The airport serves many roles in the community, including providing military training, medical flights, and disaster training. LEB is a hub for those traveling to the Upper Valley for business and vacation. Angel Flight and other charitable operators frequently fly to and from LEB to reach the local medical center and frequent organ donation flights coming through the airport. The airport also participates in regional disaster drills and is a base for disaster recovery flights. The airport supports FAA’s Aviation Career Education (ACE) Academy Program camp, and many members of the Civil Air Patrol and military operators use LEB for training.

The map shows air taxi destinations flown IFR from LEB in FY 2009. All of the destinations are in the New England states.

The table shows that general aviation piston operators comprised the highest percentage of flights in FY 2009, followed by unscheduled commercial carriers. General aviation turbine operators had the highest share of aircraft operating costs, followed by general aviation rotor and piston commercial carriers.

Lebanon Municipal Airport	Shares - FY 2009	
	Aircraft Operating Costs	Flights
Commercial Passenger Carriers - Piston 	12%	22%
Fractional Ownership Programs 	11%	8%
Nonscheduled Part 135 Passenger 	6%	4%
Part 135 Passenger – Piston 	1%	1%
General Aviation – Turbine 	33%	11%
General Aviation – Piston 	7%	34%
General Aviation – Rotor 	23%	16%
Government/Military 	1%	0%
Air Ambulance 	4%	1%
Other	2%	3%
Total	100%	100%

Local Airports



Local Airports

- Closer to metropolitan areas and provide access for the community to the national aviation system
- Some flying by sophisticated aircraft
- Most operations within the state or region
- May be important access for aeromedical and emergency services

LOCAL AIRPORTS

The 1,236 local airports are the backbone of our general aviation system with at least 1 local airport in virtually every state. They are typically located near larger population centers, but not necessarily in metropolitan or micropolitan areas. Local airports account for 42 percent of the general aviation airports eligible for Federal funding, approximately 38 percent of the total flying at the studied general aviation airports, and 17 percent of flying with flight plans; most of the flying is by piston aircraft in support of business and personal needs. In addition, these airports also typically accommodate flight training, emergency services, and charter passenger service. The flying tends to be within a state or immediate region. There are no heliports, but there are four seaplane bases in this category.

- 980 local airports supported air ambulance services.
- 121 of these airports have fulfilled a critical community service provided by Government agencies (law enforcement, U.S. Postal Service, U.S. Customs and Border Protection and/or U.S. Forest Service, U.S. Marshals Service, and Essential Air Service).
- 70 have scheduled air service that boarded more than 2,500, but less than 10,000, passengers in 2010 with 68 in Alaska.
- 42 are designated as reliever airports.
- 30 were used by large certificated air carriers for charter flights.
- The typical airport has 37 based aircraft.
- Operators spend over \$2.2 million per year flying at each of these airports.
- \$2.6 billion of AIP funds was invested at the local airports during the period 2001-2009. Recognizing that not all airports received AIP funds every year, and therefore averages can be imbalanced (or slanted), the \$2.6 billion represents a simple annual average of \$230,203 per airport, including \$78,654 in NPE funds and \$151,549 in discretionary funds. Naturally, the size and nature of capital investments varied greatly among airports within the category.

Table A-12 provides an alignment of existing categories with the proposed local airports and other notable characteristics:

- The figure also breaks out the Federal roles played by these airports; 27 are designated for Essential Air Service; U.S. Customs and Border Protection operates at 21 at these airports; the U.S. Forest Service designates 36 of these airports as fire fighting stations; there are 44 U.S. Postal Service airports, and 2 airports are designated for operations by the U.S. Marshals Service.

Table A-12: Alignment of Existing Categories With Local Airports and Other Characteristics

Existing Category	Local Airports
Commercial Service Airport	70
Designated Reliever Airport	42
General Aviation Airport	1,124
Total	1,236
Other Characteristics (included in Total)	
Seaplane Bases	4
Heliports	0
Federal Role Essential Air Service Airports	27
Federal Role U.S. Customs and Border Protection	21
Federal Role U.S. Forest Service	36
Federal Role U.S. Postal Service (air stops)	44
Federal Role U.S. Marshals Service	2
At Least One Federal Role	121

Table A-13 presents the criteria used to create all of the new general aviation categories and the average value for each criterion for Local airports. The colors represent alternative groups of criteria that, when satisfied, qualify an airport to be in the Local category.

- Criteria (light blue): 15 or more based aircraft and 10 or more IFR operations
- Criteria (light green): 2,500 or more enplanements

Most airports in the Local category qualify under the light blue criteria. There are 64 airports that qualify because they have 2,500 or more enplanements.

Table A-13: Local Airports (1,236) Data for Criteria

Category	Definitions	Local	Criteria Used for Local Category
Average Annual IFR Departures	Number of IFR departures reported in FAA ETMS data	593	10 or more
Average Based Jets	Number of based jet aircraft reported in basedaircraft.com	0	
Average Annual Enplanements	Revenue passengers that board a scheduled or unscheduled flight at a landing facility (airport, heliport, seaplane base)	820	2,500 or more
Number of Airports With Large Carrier Enplanements	Revenue passengers that board a scheduled or unscheduled flight operated by a large certificated air carrier (defined in part 241 of title 14 Code of Federal Regulations)	30	
Average Annual IFR Interstate Departures	Number of IFR departures reported in FAA ETMS data	268	
Average Number of IFR International Departures	Number of IFR departures reported in FAA ETMS data	5	
Number of Airports With Cargo lbs. >500 Million/Year	Total annual landed weight in pounds of aircraft providing scheduled or unscheduled cargo-only service at an airport	0	
Average Based Aircraft	Number of based aircraft reported in basedaircraft.com	37	15 or more
Average Number of IFR Departures Over 500 Miles	Number of IFR departures reported in FAA ETMS flown over 500 miles	57	
Number of Airports in Micro or Metro Areas	Number of airports in micro (core city) or metropolitan (regional) statistical areas as identified by the U.S. Office of Management and Budget	785	
Commercial Service	Airports that enplane more than 2,500, but less than 10,000, passengers	70	
Number of Remote Airports	Nearest NPIAS airport more than 30 miles or identified in state plans as providing remote access	54	
Number of Airports With Critical Community services	Number of airports providing access to U.S. Forest Service, U.S. Marshals Service, U.S. Customs and Border Protection, U.S. Postal Service (air stops), or Essential Air Service	121	
Number of Airports Activated After 1/1/2001	FAA records show airports opened after 1/1/2001	12	
Number of Privately Owned Airports	Number of airports held by private entities	8	
Relievers	Airports designated as relievers in the NPIAS	42	
Number of Private Relievers With Less Than 90 Based Aircraft	Airports designated as relievers in the NPIAS that are privately owned and have fewer than 90 based aircraft	0	
Number of Private Relievers With More Than 90 Based Aircraft	Airports designated as relievers in the NPIAS that are privately owned and have more than 90 based aircraft	8	
Number of Private General Aviation Airports	A private airport in the NPIAS that is not primary, commercial service, or a reliever	0	
Special Circumstance Airports With Prior Agreements	Airports entered into NPIAS for special reasons	0	

Figure A-7 shows the location of the 1,236 local airports. Although many of these airports are located in MSAs, they are widely dispersed throughout the country. Figure A-8 provides a summary of data about, and profile of, one Local airport: Neil Armstrong Airport in western Ohio.

Figure A-7: Location of Local Airports

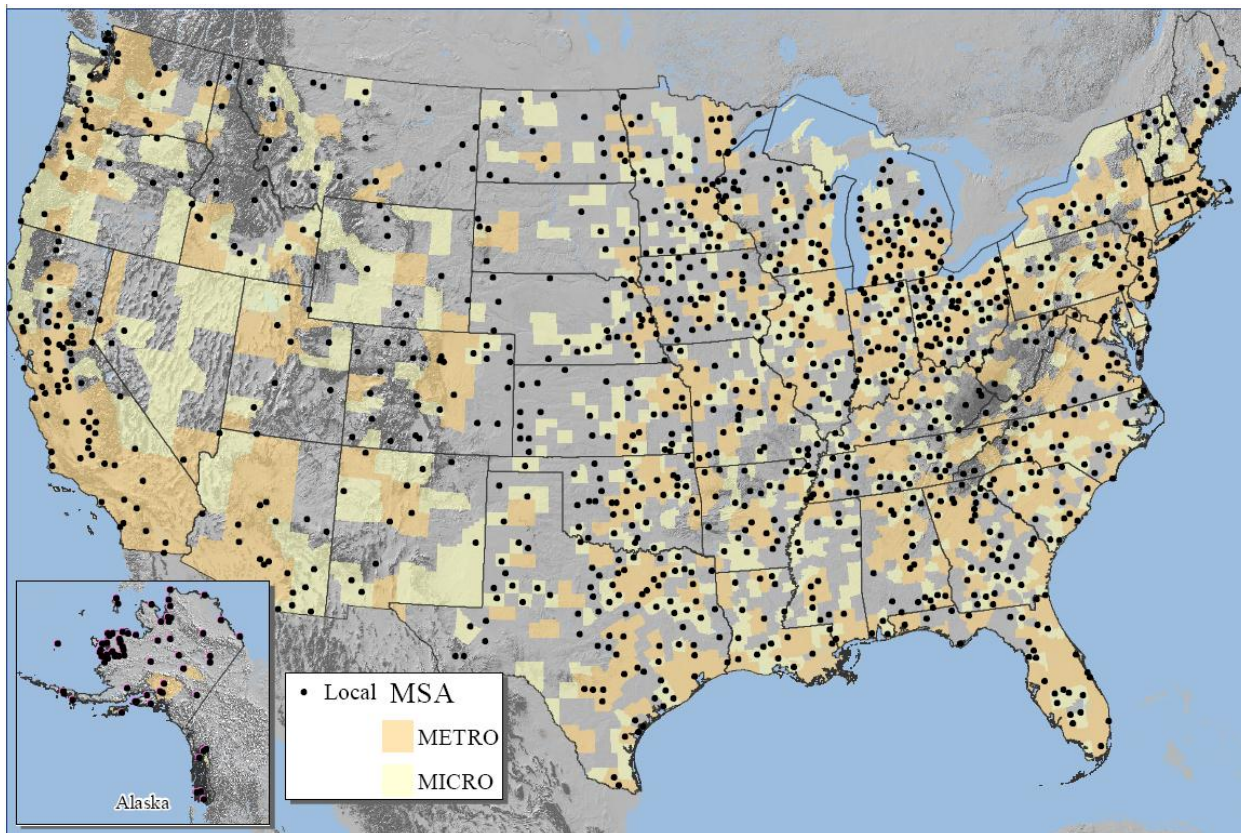






Figure A-8: Profile of Local Airport

Profile: Local Airport Serving Local and Regional Markets

Neil Armstrong Airport (AXV) is a public airport located in Wapakoneta in Auglaize County, Ohio. The airport has two runways and handled over 29,000 aircraft operations during the 12-month period ending August, 17, 2009, averaging 81 operations per day. The aircraft operations primarily consisted of local and itinerant general aviation flights, with some air taxi and military operations as well. There are 23 based aircraft at the airport, the majority of which are single engine.

AXV serves as a bustling center of commerce and an important transportation link. Its business customers represent the manufacturing, service, and financial industries. Manufacturers use the airport for the shipping of goods, and potential clients and customers often fly into the airport to tour the facilities of local businesses and negotiate business deals. Charitable organizations use the facilities to transport patients and organs to specialized medical facilities, and free flights have been provided to area youth through local organizations. The airport has also recently been used to transport abandoned animals to permanent homes.

The table indicates 92 percent of flights in FY 2009 were general aviation operations, followed by 7 percent nonscheduled part 135 operations and 1 percent air ambulance operations. Not surprisingly, general aviation operations comprised 92 percent of aircraft operating costs in FY 2009, with 75 percent accounted for by general aviation turbine operations.

Neil Armstrong Airport		Shares - FY 2009	
User Groups		Aircraft Operating Costs	Flights
Nonscheduled Part 135 Passenger		6%	7%
General Aviation – Turbine		75%	20%
General Aviation – Piston		17%	72%
Air Ambulance		1%	1%
Total		99%	100%

Basic Airports



Tangier Island Airport
Tangier, Virginia



Basic Airports

- Mostly single engine piston
- May serve remote communities
- May be access point for important Federal activities
- Access for aeromedical flights
- Access for business and agricultural flying
- Recreational flying and flight instruction

BASIC AIRPORTS

The 668 basic airports are often able to fulfill their role with a single runway, helipads, or seaplanes and limited infrastructure. Forty-three states have a basic airport. These airports fulfill the principal role of a community airport: providing a means for private general aviation flying, linking the community to the national airport system and making other unique contributions. Basic airports account for approximately 7 percent of total flying at general aviation airports and 2 percent of flying with flight plans. Most of the flying is self-piloted, for business and personal reasons, using propeller-driven aircraft. A fair amount of air charter (taxi) services is provided at these airports. There are 3 heliports and 20 seaplane bases in this category.

- 269 basic airports supported air ambulance services in 2009.
- 107 airports provide access to remotely located populations.
- 119 support a critical community service provided by Government agencies (law enforcement, the U.S. Postal Service, U.S. Customs and Border Protection and U.S. Forest Service, U.S. Marshals Service, and Essential Air Service).
- One is designated as a reliever airport.
- 19 were used by large certificated air carriers for charter flights.
- The typical airport has 10 based aircraft.
- Operators spend about \$540,000 annually on flying at these airports.
- \$1.1 billion of AIP funds was invested at the basic airports during the period 2001-2009. Recognizing that not all airports received AIP funds every year, and that simple averages can present a skewed impression, the \$1.1 billion represents a simple annual average of \$182,384 per airport, including \$68,039 in NPE funds and \$114,345 in discretionary funds. Naturally, the size and nature of capital investments varied greatly among airports within the category.

Table A-14 provides an alignment of existing categories with the proposed local airports and other notable characteristics:

- None of the basic airports are designated as commercial service (airports that enplane at least 2,500, but fewer than 10,000, passengers).

Table A-14: Alignment of Existing Categories With Basic Airports and Other Characteristics

Category	Basic Airports
Commercial Service Airport	0
Designated Reliever Airport	1
General Aviation Airport	667
Total	668
Other characteristics (Included in Total)	
Seaplane Bases	20
Heliports	3
Federal Role Essential Air Service Airports	29
Federal Role U.S. Customs and Border Protection	18
Federal Role U.S. Forest Service	17
Federal Role U.S. Postal Service (air stops)	72
Federal Role U.S. Marshals Service	1
At Least One Federal Role	119

Table A-15 presents the criteria used to create all of the new general aviation categories and the average value for each criterion for basic airports. The colors represent alternative groups of criteria that, when satisfied, qualify an airport to be in the basic category.

- Criteria (light blue): 10 or more based aircraft, or for heliports, 4 or more helicopters
- Criteria (light green): Airports designated by a Federal agency as providing a Federal service
- Criteria (light orange): An airport activated after January 1, 2001, which may still be growing into its potential after the events of 9/11 and two very deep recessions
- Criteria (light red): Airports providing remote access

The majority of airports qualify under the light blue criteria. Just over 100 qualify in each of the light green or light red criteria; 20 airports qualify because of their recent activation.

Table A-15: Basic Airports (668) Data for Criteria

Category	Definitions	Basic	Criteria Used for Basic Category
Average Based Aircraft	Number of based aircraft reported in basedaircraft.com	9	10 (4 helicopters) or more
Average Annual IFR Departures	Number of IFR departures reported in FAA ETMS data	163	
Average Based Jets	Number of based jet aircraft reported in basedaircraft.com	0	
Average Annual Enplanements	Revenue passengers that board a scheduled or unscheduled flight at a landing facility (airport, heliport, seaplane base)	520	
Number of Airports With Large Carrier Enplanements	Revenue passengers that board a scheduled or unscheduled flight operated by a large certificated air carrier (defined in part 241 of title 14 Code of Federal Regulations)	19	
Number of Remote Airports	Nearest NPIAS airport more than 30 miles or identified in state plans as providing remote access	107	Yes
Number of Airports With Critical Community Services	Number of airports providing access to U.S. Forest Service, U.S. Marshals Service, U.S. Customs and Border Protection, U.S. Postal Service (air stops), or Essential Air Service	119	Yes
Number of Airports Activated After 1/1/2001	FAA records show airports opened after 1/1/2001	20	Yes
Average Annual IFR Interstate Departures	Number of IFR departures reported in FAA ETMS data	61	
Average Number of IFR International Departures	Number of IFR departures reported in FAA ETMS data	6	
Number of Airports With Cargo lbs. >500 Million/Year	Total annual landed weight in pounds of aircraft providing scheduled or unscheduled cargo-only service at an airport	0	
Average Number of IFR Departures Over 500 Miles	Number of IFR departures reported in FAA ETMS flown over 500 miles	13	
Number of Airports in Micro or Metro Areas	Number of airports in micro (core city) or metropolitan (regional) statistical areas as identified by the U.S. Office of Management and Budget	198	
Commercial Service	Airports that enplane more than 2,500, but less than 10,000, passengers	0	
Number of Privately Owned Airports	Number of airports held by private entities	0	
Relievers	Airports designated as relievers in the NPIAS	1	
Number of Private Relievers With Less Than 90 Based Aircraft	Airports designated as relievers in the NPIAS that are privately owned and have fewer than 90 based aircraft	0	
Number of Private Relievers With More Than 90 Based Aircraft	Airports designated as relievers in the NPIAS that are privately owned and have more than 90 based aircraft	0	
Number of Private General Aviation Airports	A private airport in the NPIAS that is not primary, commercial service, or a reliever	0	
Special Circumstance Airports With Prior Agreements	Airports entered into NPIAS for special reasons	0	

Figure A-9 shows the location of the 668 basic airports. Figure A-10 provides a summary of data about and profiles of one basic airport: Taylor County Airport in central Wisconsin.

Figure A-9: Location of Basic Airports

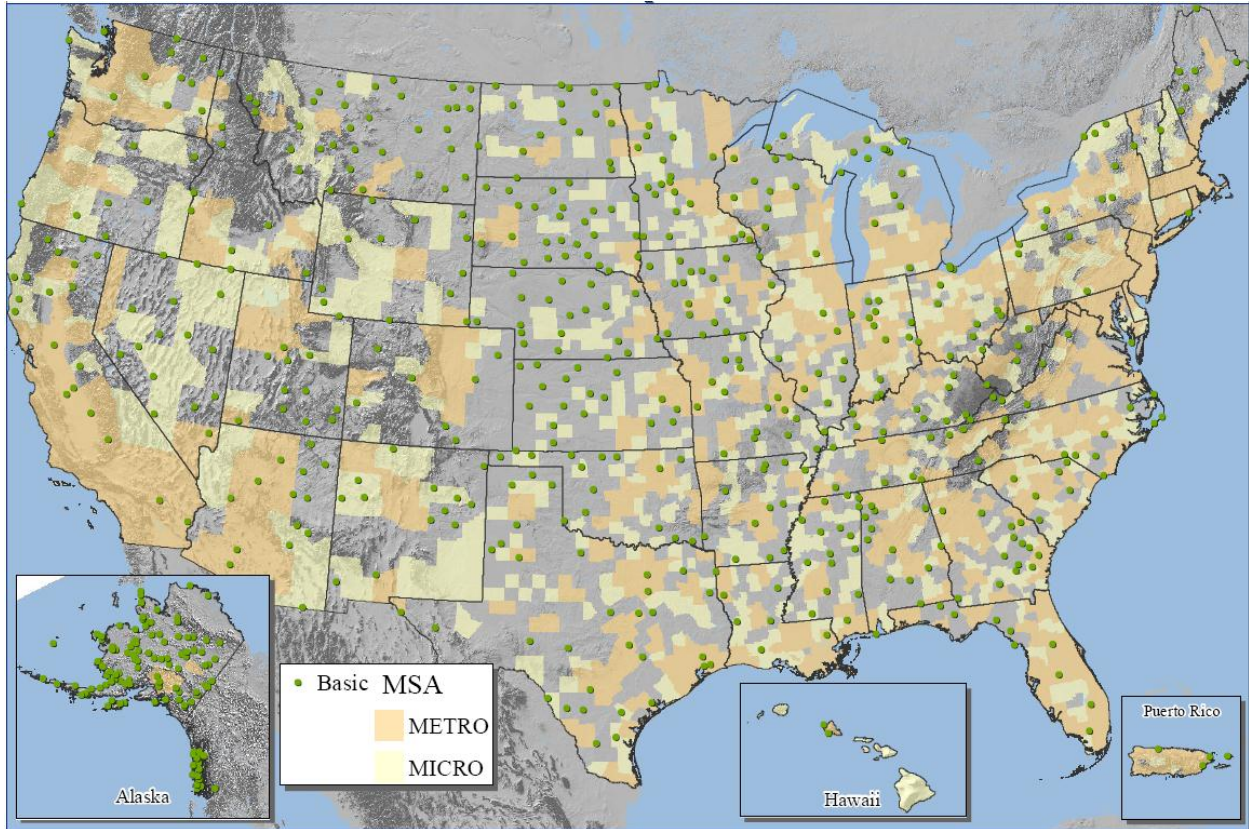


Figure A-10: Profile of Basic Airport

Profile: Basic Airport Serving Local and Regional Markets

Taylor County Airport (MDZ) is a public airport located about 3 miles southeast of the central business district of Medford, a city in Taylor County, Wisconsin. The airport has two runways and handles about 7,000 flights annually, averaging about 19 per day. There are 13 aircraft based at MDZ made up of 12 single engine aircraft and 1 jet.

With no commercial airline service at MDZ, general aviation traffic dominates activity.

MDZ is an efficient producer of self-piloted flying linking the community to the regional economy. The map shows general aviation piston flying IFR from MDZ in FY 2009. Many of the destinations are either within the state or in adjacent states with some flights going as far as North Carolina and Texas.



The table shows that general aviation piston activity accounted for 94 percent of flights in FY 2009 and 76 percent of aircraft operating costs. Part 135 air taxi/piston activity comprised 4 percent of flights and general aviation turbine and nonscheduled part 135 activity each made up 1 percent of flights. General aviation turbine activity made up 16 percent of aircraft operating costs while part 135 piston and nonscheduled part 135 each comprised 4 percent.

Taylor County Airport		Shares - FY 2009	
		Aircraft Operating Costs	Flights
Nonscheduled Part 135 Passenger		4%	1%
Part 135 Passenger – Piston		4%	4%
General Aviation – Turbine		16%	1%
General Aviation – Piston		76%	94%
Total		100%	100%

GENERAL AVIATION AIRPORTS NOT CLASSIFIED

There are 497 airports (including 475 airports, 7 heliports, and 15 seaplane bases) that did not fit into one of the four categories established. Most of these airports have been in the NPIAS for decades and may have seen an erosion of based aircraft and activity (because of population and economic shifts or recession) or may have no based aircraft. Twenty-two are privately owned and were originally included in the national system as relievers for commercial service airports, but no longer meet the criteria for this role. Others may be seasonal airports, military airfields recently converted to general aviation use, or airports used to access important state facilities with related national interests.

These airports account for approximately 6 percent of total flying at the studied general aviation airports and 2 percent of flying with flight plans. None are commercial service airports and none received scheduled air service through the EAS program. Twenty-two are listed in the NPIAS as privately owned relievers but have less than the required number of based aircraft. Most others have few or no based aircraft.

\$371 million of AIP funds was invested at these 497 airports during the period 2001-2009. Recognizing that not all airports received AIP funds every year, and that simple averages can present a skewed impression, the \$371 million represents a simple annual average of \$82,889 per airport, including \$48,757 in NPE funds and \$34,132 in discretionary funds. Naturally, the size and nature of capital investments varied greatly among airports within the category.

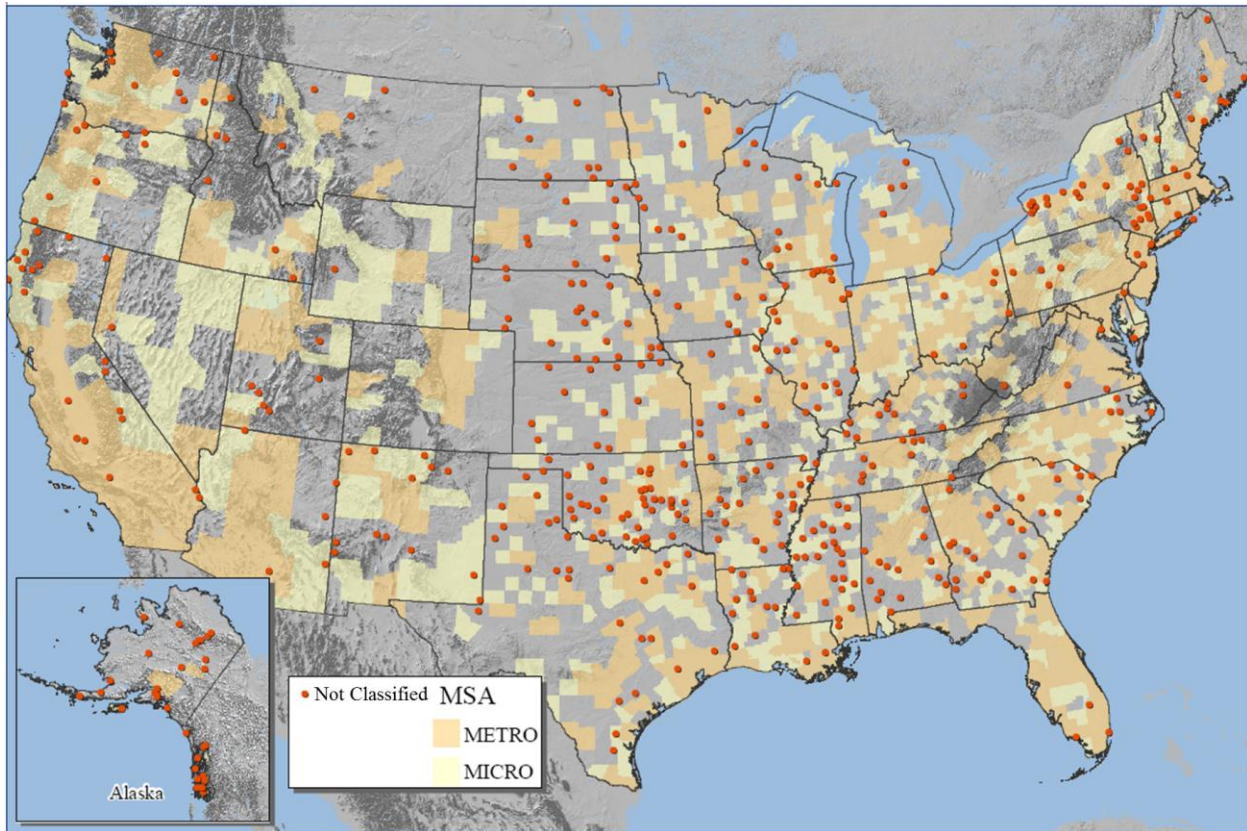
We need to further study these airports to better understand and define their role in the national airport system. The FAA will work with the aviation community to assess and potentially categorize these airports, heliports, and seaplane bases in the future by either adjusting the criteria used to create the new categories or perhaps creating a fifth category. Table A-16 provides an alignment of existing categories with these Airports.

Table A-16: Alignment of Existing Categories With Airports Not Classified

Category	Not Classified Airports
Commercial Service Airport	0
Designated Reliever Airport	22
General Aviation Airport	475
Total	497

Figure A-11 shows the location of the airport not classified.

Figure A-11: Location of Airports Not Classified



RELIEVER AND PRIVATELY OWNED AIRPORTS

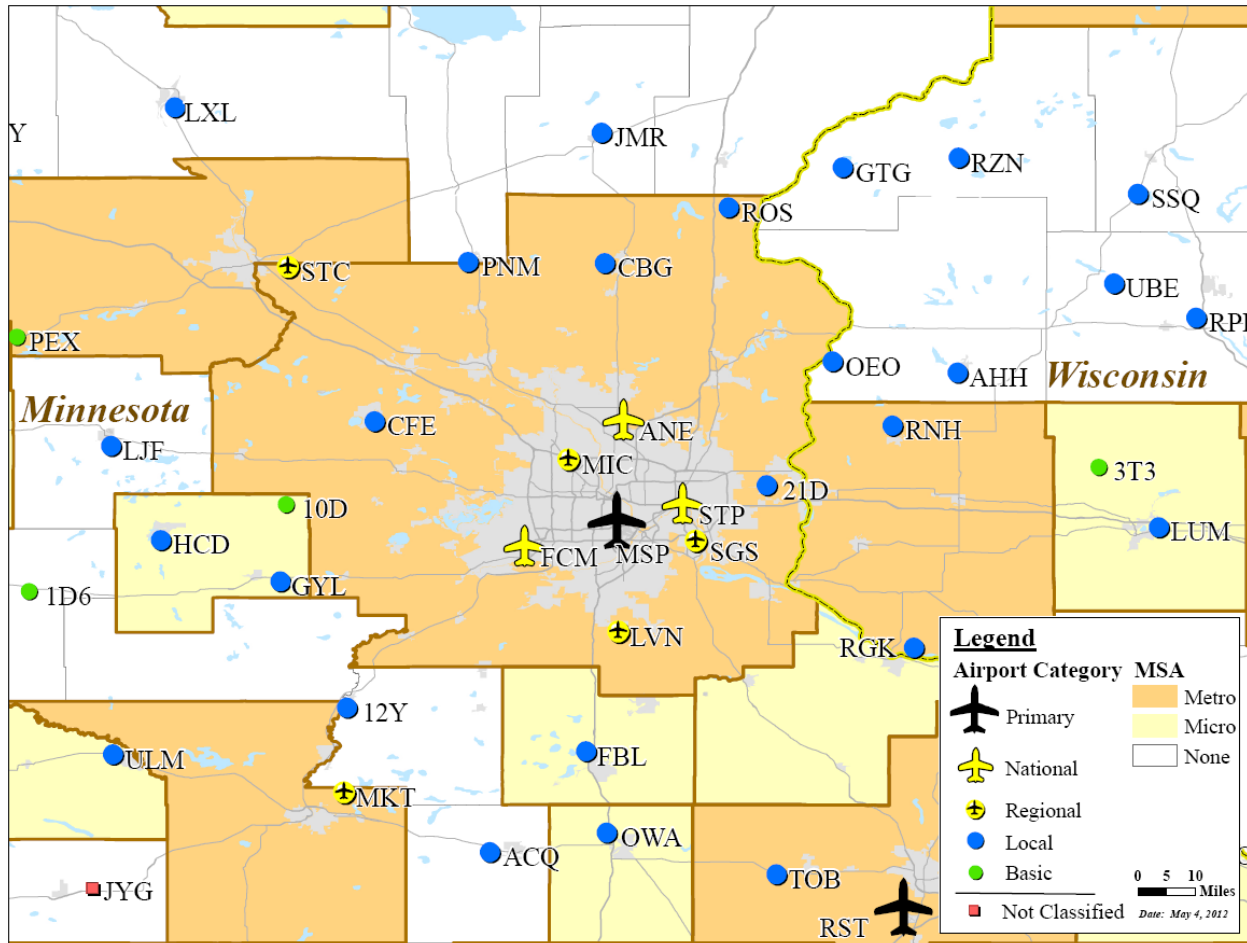
In conducting the study, the FAA was also cognizant of the evolving role of relievers in the national system and the role of selected privately owned airports that are part of the NPIAS. The reliever concept was established in 1962 (1963 National Airport Plan) and stated that general aviation reliever airports are a necessary part of the larger metropolitan area airport systems. In the 1968 Amended National Airport Plan, a total of 147 general aviation airports were designated as relievers for the air carrier airports serving the 22 large hub geographic areas. In 1992, DOT's Office of the Inspector General examined the reliever program and, as a result, a new reliever criterion was implemented in 2000. As part of the ASSET study, we examined the reliever airports and how they function in the existing system. Many of the airports designated as relievers serve their own function in the regional system that is unrelated to relieving congestion. Therefore, we feel that the 50-year-old term, reliever, may no longer be relevant.

Currently, privately owned airports may be eligible to be included in the NPIAS if they are designated by the FAA as a reliever. As part of this study, the FAA examined some of the issues that privately owned airports have experienced. Those issues include how to ensure the long-term viability and availability of the airport for the benefit of the community it serves, how the airports are able to protect against encroachment of incompatible land uses or obstructions, and steps the airports can take to foster a positive relationship with the community.

HOW NPIAS AIRPORTS WORK TOGETHER AS A SYSTEM

Figure A-12 is a map centered on Minneapolis-St. Paul International Wold-Chamberlain Airport (MSP), the large hub airport in the Minneapolis St. Paul metropolitan region. The airports within 30 miles of the large hub are the NPIAS airports included in the Twin Cities Aviation System Plan (2009). Not shown on the map, but included in the plan, are two seaplane bases that are not in the NPIAS (Surfside and Wipline).

Figure A-12: Twin Cities Aviation Plan Airports in NPIAS



MSP is a large hub primary airport, meaning that it enplanes at least 1 percent of the total passengers boarding commercial flights in the United States. All scheduled commercial operations in the region operate from MSP. The region has a number of other airports that also play important roles in the system:

National Airports: Anoka County-Blaine, Flying Cloud, and St. Paul Downtown Holman Field airports have a strong corporate aviation base. All three airports are classified as national airports using the new FAA categories for general aviation airports. Each primarily serves business flying, with numerous jet operations and substantial IFR operations, both nationally and internationally. St. Paul Downtown Holman Field has the largest component of corporate

operations, which is reasonable given its proximity to the central business districts in each of the Twin Cities. It is also the only airport with a runway longer than 5,000 feet, which is desirable for heavier jet operations. All three national airports help to divert traffic from MSP and are designated as relievers.

Regional and Local Airports: Airlake, Crystal, South St. Paul Municipal-Richard E. Fleming Field, and Lake Elmo airports cater more to recreational and small business aviation needs. Each airport provides valuable resources for the metropolitan community, encouraging growth in commerce and jobs, providing green space and recreational opportunities, and boosting the area economy. The first three in this group are classified as regional airports using the new FAA categories, while Lake Elmo is a local airport. While these airports are designated as relievers for MSP, this is not their primary role.

All of the airports in the Twin Cities plan are within a metropolitan statistical area. Anoka, Flying Cloud, and St. Paul Downtown Holman Field all have enough based jet aircraft, international departures, and interstate operations to qualify as national airports. Crystal, Air Lake, and South St. Paul Municipal-Richard E. Fleming Field all have enough IFR flights, IFR flights over 500 miles, and over 100 based aircraft to qualify as regional airports; none of these airports has a based jet. Lake Elmo qualifies as a local airport, with more than enough IFR flights and based aircraft; however, it does not have enough IFR flying to qualify as a regional airport.

The new FAA categories reflect the roles of the seven general aviation airports in the Twin Cities plan. Together these airports support the corporate, business, and recreational flying needs in the metropolitan region, while providing general aviation capacity, some of which, in their absence, would be provided at the region's large hub airport.

Table A-17 provides the characteristics data of each individual airport discussed above and used to categorize these airports into the new FAA categories.

Table A- 17: Twin City General Aviation Airports Data for Criteria

Category	Definitions	Anoka County-Blaine Airport (Janes Field)	Flying Cloud	St. Paul Downtown Holman Field	Crystal	Airlake	South St. Paul Muni-Richard E Fleming Field	Lake Elmo
New General Aviation Airport Category		National	National	National	Regional	Regional	Regional	Local
Based Aircraft	Number of based aircraft reported in basedaircraft.com	386	370	86	207	137	237	196
Based Jets	Number of based jet aircraft reported in basedaircraft.com	13	17	35	0	0	0	0
Annual Enplanements	Revenue passengers that board a scheduled or unscheduled flight at a landing facility (airport, heliport, seaplane base)	87	245	150	6	6	6	0
Annual IFR Departures	Number of IFR departures reported in FAA ETMS data	12,503	15,847	21,470	2,576	1,459	1,536	846
Annual IFR Interstate Departures	Number of IFR departures reported in FAA ETMS data	8,457	9,179	15,229	1,193	812	904	458
Number of IFR Departures Over 500 Miles	Number of IFR departures reported in FAA ETMS data	1,379	2,125	5,460	170	116	151	65
Number of IFR International Departures	Number of IFR departures reported in FAA ETMS data	66	127	471	18	3	20	1
Remote Airport	Nearest NPIAS airport more than 30 miles or identified in state plans as providing remote access	No	No	No	No	No	No	No
Critical Community Services	Number of airports providing access to U.S. Forest Service, U.S. Marshals Service, U.S. Customs and Border Protection, U.S. Postal Service (air stops), or Essential Air Service	No	No	Yes: U.S. Customs and Border Protection	No	No	No	No
Relievers	Airports designated as relievers in the NPIAS	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Privately Owned	Number of airports held by private entities	No	No	No	No	No	No	No
Micro or Metropolitan Areas	Number of airports in micro (core city) or metropolitan (regional) statistical areas as identified by the U.S. Office of Management and Budget	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Commercial Service	Airports that enplane more than 2,500, but less than 10,000, passengers	No	No	No	No	No	No	No

Appendix A-3: An Analysis of User Group Spending

The traditional way to identify the users at an airport is to count their operations. The majority of general aviation airports have more piston flying than any other type of flying, but at many airports other important roles are hidden behind the operations numbers. Using a special model developed for the FAA's Air Traffic Organization, it was possible to get behind the operations numbers at 2,712 of the 2,952 general aviation airports. The analysis revealed that if one examined the total amount of money users at an airport spent on flying, the roles of the airports became more apparent.

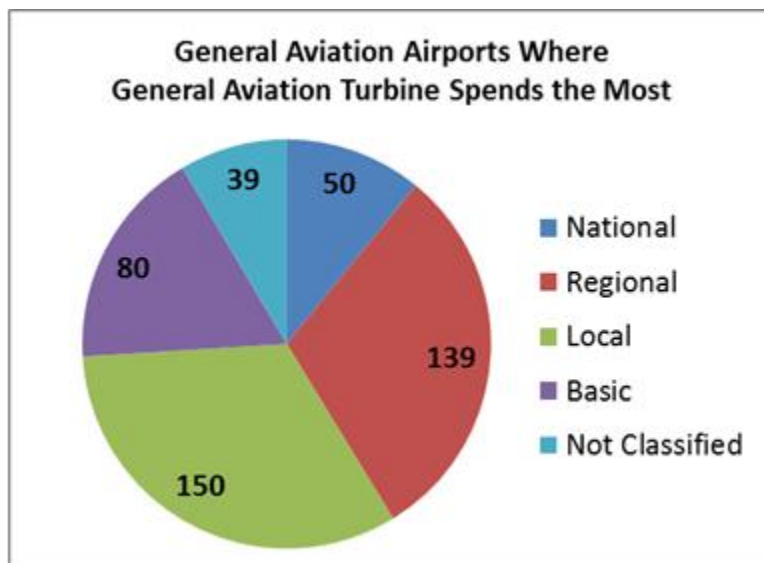
How It Was Done

The FAA has developed the Air Traffic Services Business Model to estimate the cost of providing air traffic services to individual IFR flights and to assess various policy options for funding those services. One of the outputs of the model is an estimate of the cost of flying each individual flight in the en route system. This model was supplemented with data from the "General Aviation and Part 135 Activity Survey (2008)," which provides information on VFR flying by state. Using these data, it was possible to estimate the operations and cost of flying by individual user groups at 2,712 nonprimary airports. These data showed which users were spending the most money producing air transportation.

The following charts document the category of airports where particular user groups spend the most on aviation.

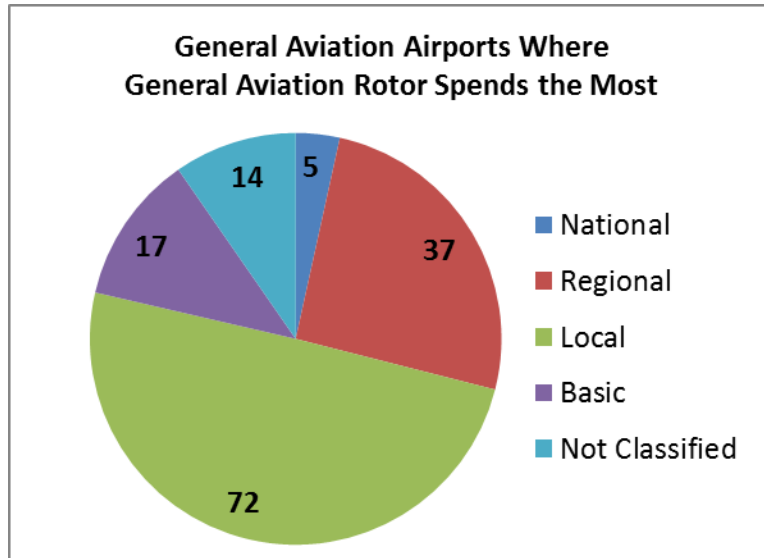
- General aviation turbine operators spent the most at 458 airports. Figure A-13 shows that these airports are spread across every general aviation category. However, a higher percentage of national and regional airports have general aviation turbine operators as the largest spending group.

Figure A-13: General Aviation Turbine Spending



- Figure A-14 shows that general aviation rotorcraft operators are the largest spending operators at 145 general aviation airports. All of the new airport categories are represented as shown below.

Figure A-14: General Aviation Rotor Spending



- Air ambulance operators were the highest spending user group at 73 airports, distributed as shown in Figure A-15.

Figure A-15: Air Ambulance Spending

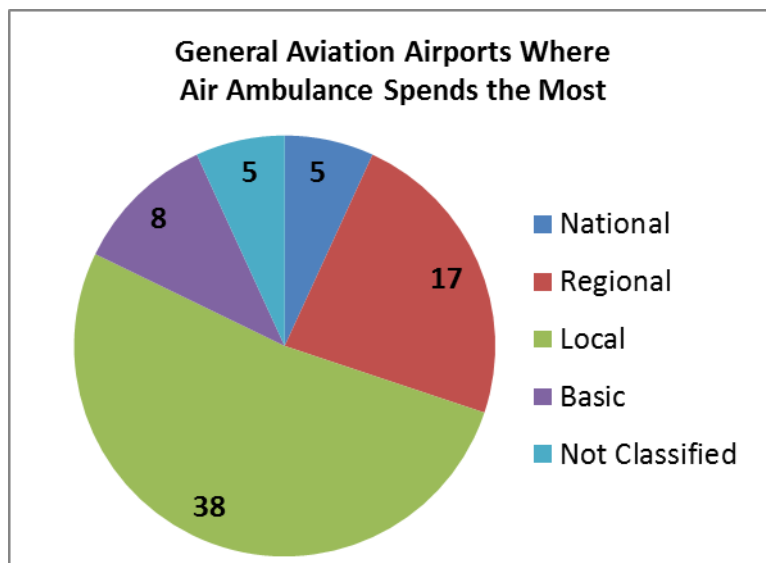
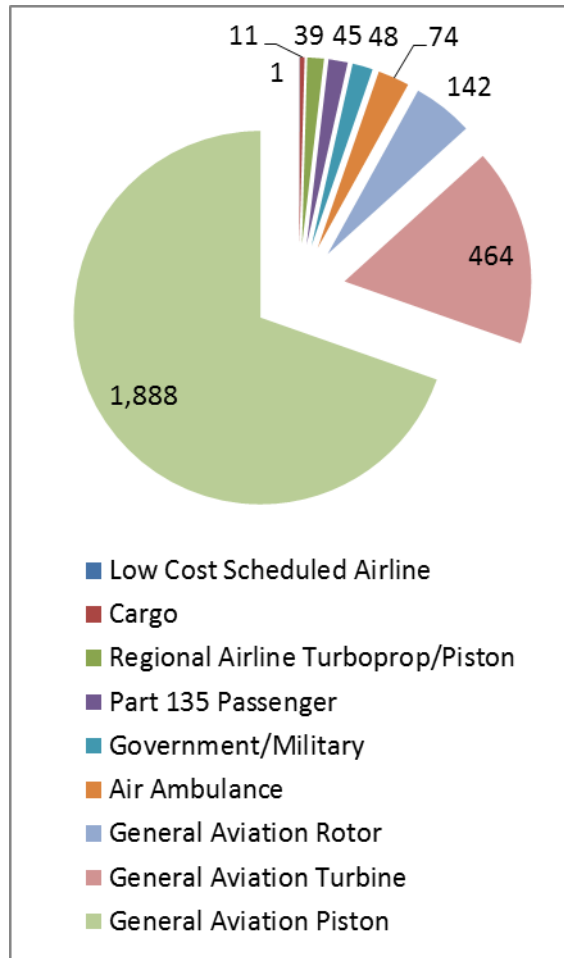


Figure A-16 shows the number of airports where particular user groups spend the most money on aircraft operating costs.

**Figure A-16: Largest User Group at General Aviation Airports:
Spending on Aviation Services**



SOME OTHER INTERESTING FINDINGS

Estimating the amount of money aviation users paid to operate aircraft at each airport revealed some other interesting findings:



Regardless of the size of a general aviation airport, an average of 6 to 13 percent of user costs were paid by air ambulance services, supporting medical services in the local community.



While turbine, fractional ownership programs, and part 135 charter operators account for only a small share of operations at smaller airports, on average they account for over 30 percent of spending on aviation services, usually supporting local businesses in the community.

Appendix A-4: Regression Test for Consistency

In the ASSET report, category descriptions were created to reflect the different roles airports play in their communities and in the national and international economies. A unique set of criteria (from available data on airports) were used to assign airports to one of the categories. The application of the criteria was an iterative process, to ensure that an airport's assigned category (national, regional, local, basic plus not classified, or 1 through 5) fit the description of that category.

To complete the process, a statistical model was created to apply the criteria to each airport and replicate the assigned category. There were two reasons for this final step:

- **Consistency:** The statistical model applies all of the criteria to each airport and provides weights (the coefficients of the regression equation) for each criterion. Applying the weights to the criteria for each airport produces an estimated category, which can then be compared to the assigned category. Any differences were investigated, and where it appeared that the estimated category more closely corresponded to the role of the airport in its community or the economy, the assigned category was changed.
- **Bias:** The regression can be used to see if any particular type of airport was unfairly treated.

The model is a linear regression of the form:

$$\text{Estimated Category} = \text{Intercept} - a_i \times \text{Criteria}_i + e,$$

Explanation of linear regression equation: where the intercept is category 5, every airport starts out as not classified and moves toward a category 1 (national airport) as you subtract the product of the weight (coefficients) times the criteria for that airport.

For example, an airport with over 5,000 IFR flights would subtract .75 from the intercept and thus move closer to category 1. The e_i term is the error in the regression equation and is used to test its accuracy.

When we apply the statistical model to the population of airports (including privately owned airports) and then take account of certain overriding factors that are not part of the model, we find that it replicates the assigned categories for all airports in about 97 percent of the cases. The remaining cases were examined individually for possible reallocation. The result was the final assignment of airports to categories.

The analysis produced an exception report, showing the 87 airports (out of 2,952) that the model misclassified. Each of these airports was reviewed individually before a final classification was completed. The data were updated and classifications were retested. In some cases, all airports appear to be in the correct categories and no airports seemed to experience bias.