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Determinants of Financial Health of US General Aviation Airports

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Abstract

This survey-based study investigates the current financial environment of US general aviation airports. Due to a dearth of data and research on the financial performance of general aviation airports, the paper provides vital information regarding the critical needs and major revenue sources of such airports. The findings suggest that general aviation airports can be self-sustaining regardless of their location, runway length and other airport-specific characteristics. The attitudes of the airport manager towards the importance of financial self-sustainability, positive relationships with local communities, and utilisation of non-traditional and non-aviation revenue sources are found to be critical for the financial health of general aviation airports. In addition, the research provides estimates of the funding needs of US general aviation airports and evidence of the cumulative demand for T-hangars on a national basis.

Keywords

general aviation airport, revenue sources, financial self-sufficiency

MANAGERIAL AND POLICY IMPLICATIONS

- To the best of the authors' knowledge, this is the first scholarly study of its depth that focuses specifically on the detailed financial characteristics of general aviation airports.
- The paper highlights the important factors affecting revenue generation at general aviation airports.
- The paper provides extensive statistical analyses regarding how an airport's financial position is influenced by major factors such as runway length, location, annual operations, instrument approach availability, fuel sales, availability of aircraft storage hangars, etc.
- The paper examines the attitudes of airport managers towards the importance of self-sustainability, a positive relationship with the local community,

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and the utilisation of non-aviation and non-traditional revenue sources on the financial performance of general aviation airports.
- It is anticipated that the findings of this paper will trigger further studies, particularly in light of increasing scrutiny on the financial performance of federally-assisted general aviation airports and the FAA's policy of encouraging general aviation airports to be financially self-sustaining.

INTRODUCTION

The USA accounts for nearly 50 per cent of all general aviation activity in the world.[1] To support this activity, communities throughout the USA have developed and are maintaining general aviation airports to provide access to the national air transportation system. Many smaller airports are not able to sustain themselves financially through user fees and other rates and charges and, as a result, deficits are being carried by the community through subsidies.

While the Federal Aviation Administration (FAA) provides financial assistance for capital improvements (eg building runways, taxiways, aircraft parking aprons, etc), the agency does not normally financially support the operation and administration of the airports (although exceptions are made for emergencies, such as hurricanes, terrorist acts, etc). In addition, the FAA currently promulgates a policy encouraging all airports to be financially self-sufficient through appropriate rates and charges based on fair market value. For commercial service airports that have airline passengers, large numbers of based aircraft, extensive developable and high-value real estate, and other assets, financial self-sufficiency is much easier to achieve. However, at smaller airports with less extensive facilities and supporting activity, attaining self-sufficiency is much more difficult.

US Congress has recognised this as an issue, and with the passage of the Vision 100 — Century of Aviation Reauthorization Act 2003, projects such as hangars, fuel systems and other economic development-oriented projects at general aviation airports are now eligible for federal grant assistance through the FAA's Airport Improvement Program (AIP). Such funding, however, is restricted to the amount of the airport's (entitlement) apportionment allocation ($150,000 per annum) and then, only after all other aeronautical needs have been satisfied. No federal discretionary or other non-entitlement funds are authorised for such uses. In the first full fiscal year since the passage of the Vision 100 Act, only 52 general airports (out of 2,556 eligible) have been able to use federal funding for economic development projects, including 31 fuel farm projects, 12 hangar projects and nine T-hangar projects.[2]

While the dearth of AIP-funded economic development projects is not indicative of the restrictions on funding availability, it does suggest that the basic aeronautical development needs (runways, taxiways, etc) of general aviation airports supplant the opportunity for implementing projects that would improve their fiscal environment. More information regarding the financial characteristics of general aviation airports, including local views concerning the relative importance of financial self-sufficiency and economic development projects, are useful in understanding how current policies and practices may be adjusted to better assist general aviation airports to achieve financial self-sufficiency.

The purpose of this study was to investigate the current financial environment of publicly owned and operated general aviation airports, and to develop an outlook for future potential. The study identifies basic airport demographic data and the views of general aviation airport managers regarding their facility's current financial situation, access to state, local and private sector funding resources, current fuel handling activity, T-hangar vacancies, other concepts for enhancing revenue, and attitudes towards attaining financial self-sufficiency. The target population consisted of general aviation airports in the 48 contiguous US states that are open for public use and included in the FAA database.

Other than some limited data collected by national organisations, such as the American Association of Airport Executives (AAAE) and the National Association of State Aviation Officials, there is a dearth of research on the financial performance of general aviation airports. As such, this study provides a foundational research effort, presenting vital information regarding the critical needs of general aviation airports in the USA.

FINANCIAL PERFORMANCE AND FUNDING OF GENERAL AVIATION AIRPORTS

US airports account for more than 9 per cent of all spending on air transportation.[3] In its 2002 National Plan of Integrated Airport Systems, the FAA estimated total airport revenues in 1999 to be $20.7bn.[4] The report goes on to show that the revenue statistics are distinctly different for commercial service, reliever and general aviation airports.[5] Out of $20.7bn of total revenue, reliever and general aviation airports accounted for only $870m (4.2 per cent) and $1.02bn (4.9 per cent) respectively. As reported by the FAA, only large and medium commercial service airports are relatively self-sustaining (ie had revenues that exceeded expenses in 1999) and received 3–11 per cent of their budget from the federal grants for development. Smaller commercial service airports, reliever and general aviation airports had total revenue to total expense ratios of 95.1 per cent and 88.5 per cent, suggesting that these airports need 4.9–11.5 per cent more revenue to cover their costs. Reliever and general aviation airports had revenue vs expenses ratios of 88.5 per cent and 88.7 per cent, respectively, implying that general aviation airports need more than 11 per cent in additional revenues to break even. While large airports received 3–11 per cent of their budget from the federal grants, federal funding accounted for about 28 per cent of the budget of smaller airports.

Table 1 presents estimated financial data for general aviation airports. The data were extracted from the FAA National Plan of Integrated Airport Systems (NPIAS) Reports to Congress in 1999 and 2002, which provide data for 1992 and 1999, respectively.[6,7] Unfortunately, airport financial data before 1992 and after 1999 are not available. No specific data for general aviation airports are available in the FAA NPIAS Reports to Congress of 2004 and 2006. The 2004 report states that financial information for general aviation airports is more difficult to obtain and provides the summary of the 2001/02 AAAE survey.[8] In this survey, the AAAE collected data from 122 general aviation airports that had average annual revenues of $1.53m and average operating expenses of $1.59m. Based on this survey, the average annual losses of a general aviation airport in 2001/02 were around $60,000.

Due to the differences in the methodologies between the two NPIAS reports,

Table 1 Estimated general aviation airport revenues and expenses

	Revenues/expenses ($m)	
Category	***1992***	***1999***
Landing fees		2.1
Terminal rents		6.2
Fixed based operator	39.2	95.1
Cargo	0.0	35.1
Other aeronautical fees	85.3	88.4
Subtotal aeronautical	124.5	226.8
Concessions	9.7	4.5
Parking and car rental		0.5
Other non-aeronautical fees	140.2	100.8
Subtotal non-aeronautical		$105.9
Total operating revenues		$332.7
Bond		122.3
Grant (estimated)	229	386.9
Actual FY 99 federal grants	(252)	(342.2)
Other non-operating revenues	72.2	180.3
Total non-operating revenues		$689.5
Total revenues	536.1*	1022.2
Average revenues per airport	*0.2**	*0.4*
Compensation		128.8
Supplies		43.7
Services		30.9
Other operating expenses		152.1
Total operating expenses	250.4*	355.5
Debt service payments net of capitalised interest		84
Sum capital expenses		648.2
Other non-operating expenses		64.9
Total non-operating expenses	201.1	797.2
Total expenses	451.5*	1152.7
Average expenses per airport	*0.2**	*0.5*
Ratio of total revenues to total expenses (%)	118.7	88.7
Net income (loss)	*84.6**	*(130.5)*

Source: US Department of Transportation, Federal Aviation Administration (1999, 2002) 'National Plan of Integrated Airport Systems'.
*There is a discrepancy with 1992 total revenues and total expenses figures. As the average airport data indicate breakeven (revenues are equal to expenses of $200,000), total revenues and total expenses should also match each other. If total revenues and expenses are stated correctly, then the averages should indicate that an average general aviation airport in 1992 was profitable.

a direct comparison between 1992 and 1999 revenues and expenses by category is not meaningful. Nonetheless, figures for revenues and expenses suggest that, on average, general aviation airports were able to break even in 1992 (average revenues were equal to average expenses of $200,000). However, the 1999 data suggest that the average general aviation airport was losing about $100,000 per year.

The FAA forecasts 1.7 per cent annual growth in general aviation aircraft operations from 2005 to 2015.[9] This translates to an 18.4 per cent increase over the next 10 years and implies that major investments will be needed to expand facilities at general aviation airports. Table 2 presents general aviation airport development costs for 1998–2002, 2001–2005 and 2005–2009, categorised by purpose of development. Only development that is eligible to receive federal grants under the AIP is included in the estimate. Certain airport developments, such as automobile parking structures, hangars, air cargo buildings, or the revenue producing portions of terminal buildings, are not eligible for AIP grants. In addition, the estimate does not include improvements for airport access to highway and transit systems beyond the airport property line, suggesting that the figures in Table 2 are most likely to be understated. Total funding requirements for general aviation airports (subject to discussed above limitations) were $4bn for 1998–2002, $5.8bn for 2001–2005, and projected at $6.9bn for 2005–2009. This represents 44.5 per cent growth in funding requirements from 1998 to 2001 and 71.2 per cent increase from 1998 to 2004. Both the FAA and the Airport Council International (ACI) estimate average annual planned development costs for general aviation airports of $1.17bn.[10]

US airport development is funded by a combination of private and public sources and the amount and type of funding vary with respect to the airport's size and activity. Major sources of funding for

Table 2 Estimated development costs for general aviation airports

Development category	*1998–2002 ($m)*	*2001–2005 ($m)*	*2005–2009 ($m)*
Safety/security	197	147	173
Reconstruction	871	1,301	1,512
Standards	2,498	3,752	4,437
Environment	18	9	37
Capacity	168	82	140
Terminal	8	2	22
Access	63	93	94
New airports	215	450	831
Total	4,037	5,836	6,910

Source: US Department of Transportation, Federal Aviation Administration (1999, 2002, 2004) 'National Plan of Integrated Airport Systems'.

development include the federal Airport and Airway Trust Fund, which provides financing for the AIP, passenger facility charges (PFCs), state airport programmes and airport revenue sources such as landing fees, concessions, rents, parking, etc. The Airport and Airway Trust Fund finances AIP grants through taxes on users of the aviation system. These taxes include the airline passenger ticket tax, a flight-segment tax, a tax on international arrivals and departures, a tax on cargo waybills and a non-commercial aviation fuel tax. Overall, the largest source of airport development funding is the municipal bond market, with a secondary role played by the federal AIP and PFCs.

Unlike commercial service airports, general aviation airports do not have access to PFCs as they do not provide commercial passenger service. They also are restricted from debt financing due to their limited ability to repay the debt. Therefore, AIP grants and, to a lesser degree, state grants are the major source of finance for general aviation airport development. However, with AIP funds insufficient to cover all eligible projects, the potential shortfall for general aviation airports represents approximately 27 per cent of planned development costs.[11] Depending heavily on federal funds, general aviation airports were significantly affected by the US Congress decision to cut federal funding of airport capital development. Between 1992 and 1998, Congress reduced annual federal funding of airport capital development by nearly $500m, which represents a 24 per cent decrease in 1992 dollars.[12] In addition, the FAA distinguishes all development projects into several categories to which it assigns priorities. Reconstruction and mandated projects including safety, security and environmental requirements are the FAA's highest priorities.[13] As most federal grants either fund safety-related projects or preserve the existing infrastructure, general aviation airports have to seek other financing options for landside renovation and other low-priority projects.[14]

RESEARCH DESIGN AND DATA

The present study focused on the financial conditions of US general aviation airports by measuring the perceptions of airport managers with regard to the financial situation of their airport and how important they perceived certain criteria relating to financial issues of general aviation airports.

Initially, an exploratory research study was performed which included 47 interviews of general aviation airport managers and a roundtable discussion at the 2005

AAAE Annual Airport Finance and Administration conference. The interview questions are presented in Appendix A. Based on the initial interview responses and the roundtable discussion, the survey instrument was refined and a nationwide survey of 2,288 general aviation airport managers representing the accessible population was conducted to collect specific data regarding airport financial characteristics, focusing on revenue-generating facilities (T-hangars, fuelling systems, etc) and attitudinal characteristics with respect to potential improvements and the airport's financial condition. A sample of 588 general aviation airports was collected, representing a 25.7 per cent response rate. The data were then evaluated to develop demographic statistics and correlational characteristics based on airport facilities, geographical location, current subsidies and other financial support, and certain characteristics self-reported by the airport managers.

Survey methodology was chosen as the method for collecting data because none of the secondary data sources could provide information required to answer the research questions. As is the case with most survey-based research efforts, this study has several limitations. These include: the honesty of responses is assumed (the results of this study may therefore be affected by the degree of truthfulness of the responses); missing data (some respondents did not complete all the questions); limited survey returns (the survey relied upon voluntary participation which affected the total number of returned surveys, meaning that responses may have been limited to only those who wished to be heard); and the data collected only measured the instantaneous reaction of the respondents. The sample did not represent random selection but rather was formed from the accessible population of general aviation airports located in the 48 contiguous US states that are publicly owned (eg municipal, airport authority, etc) and included in the FAA airport database. General aviation airports located in Alaska and Hawaii were excluded from the survey due to the fact that the majority of general aviation airports in these states are owned and operated by the respective Departments of Transportation, which determine funding priorities and the economic development needs along with the allocation of financial resources. Furthermore, the distinctive characteristics of general aviation activity in Alaska and Hawaii are highly specific and could possibly have skewed the data and confounded the results of the study.

The survey questionnaire is presented in Appendix B. For most of the questions, an interval scale from 1 to 7 was used (1 was the 'low' endpoint and 7 was the 'high') in order to analyse the answers quantitatively. A score below 4 was considered negative. Similarly, a score above 4 was perceived as positive. Some questions were later assigned numeric values to make data coding possible and other questions relating to demographics were coded as nominal (no numeric) answers. Of 590 returned surveys, 588 satisfied stringent quality control guidelines and were included in the analysis.

As illustrated in Figure 1, all FAA regions are well represented in the sample, with the lowest number of respondents being from New England (24 airports) and the highest number from the Great Lakes region (128 airports). Four hundred and seventy (80 per cent) airports in the sample have runways longer than 4,000 feet. The largest group in the sample is general aviation airports with at least one published non-precision instrument approach procedure (ie a standard instrument approach procedure in which no

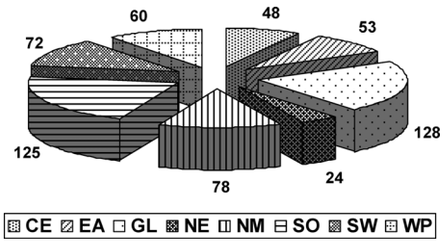

Figure 1 Geographic location of general aviation airports in the sample according to FAA region
CE, Central Region; EA, Eastern Region; GL, Great Lakes Region; NE, New England Region; NM, North-west Mountain Region; SO, Southern Region; SW, South-west Region; WP, Western Pacific Region

electronic glide slope is provided), with 305 (57 per cent) airports. The next largest groups are airports with at least one precision instrument approach (ie a standard instrument approach procedure in which an electronic glide slope is provided, such as instrument landing system (ILS) and precision approach radar (PAR), with 120 (22 per cent) airports, and general aviation airports without published instrument approach procedures, with 114 (21 per cent) airports.

The 2,288 general aviation airports were also classified according to the number of based aircraft and total estimated annual operations. Table 3 presents the classification and distribution of general aviation airports classified from the lowest to the highest quartiles. General aviation airports from all four quartiles according to based aircraft have substantial representation in the sample: from 87 airports (15 per cent) for the first quartile, to 226 airports (38 per cent) for the fourth quartile. With respect to annual operations, general aviation airports in the sample are also approximately evenly distributed, including the lowest number of 102 airports (17 per cent) from the second quartile and the highest representation of 203 airports (35 per cent) from the fourth quartile.

Twenty-six per cent of general aviation airport managers in the sample indicated that their airport was not subsidised (self-sufficient). Financial self-sufficiency is defined as the ability of an airport to generate adequate revenue to cover all normal expenses for its operation, administration and maintenance, and for the local share of federal and/or state-funded capital improvement projects (CIP). The majority of subsidised airports in the sample (66 per cent) are subsidised for both operations and CIP. Twenty-four per cent of subsidised airports use subsidies only for CIP.

All general aviation airport managers in the sample have considerable airport management carrier experience and tenure. The average tenure of respondents at their current airport is 8.5 years, while the average total for managers in airport management is 11.9 years.

ANALYSIS OF THE RESPONSES

The survey results are presented in the order in which the questions appeared in the questionnaire. The results are

Table 3 Classification and distribution of the general aviation airports in the sample according to number of based aircraft and annual operations

	Based aircraft classification	*Airports in the sample (%)*	*Annual operations classification*	*Airports in the sample (%)*
Quartile 1	≤15	15	≤7,000	28
Quartile 2	>15; ≤30	23	>7,000; ≤14,000	17
Quartile 3	>30; ≤60	24	>14,000; ≤33,000	20
Quartile 4	>60	38	>33,000	35

categorised according to the respondents' demographics, highlighting the differences among groups. Statistical significance was assessed using the T-test and factorial analysis of variance (ANOVA) for numerical variables and the chi-square test for categorical variables.

The first question was intended to assess the general aviation airport managers' perceptions about their airports' overall financial situation. With a mean score of 3.95, the data suggest that general aviation airport managers perceive the overall financial situation of their airports as slightly below average. As presented in Figure 2, a difference in perception can be distinguished among FAA regions. The perception of general aviation airport managers in the New England region seems to be more negative than in all the other regions. In contrast, southern and south-west region airports are perceived by their managers to be more positive financially than their counterparts in other regions. The differences are statistically significant (at the 5 per cent level) for the southern and south-west regions and marginally significant (at the 10 per cent level) for New England.

Figure 3 illustrates the differences in perception of financial situation according to general aviation airport runway length. The data suggest that airports with longer runways appear to be better financially than airports with runway lengths of less than 4,000 feet.

As presented in Figure 4, general aviation airports with instrument approaches are

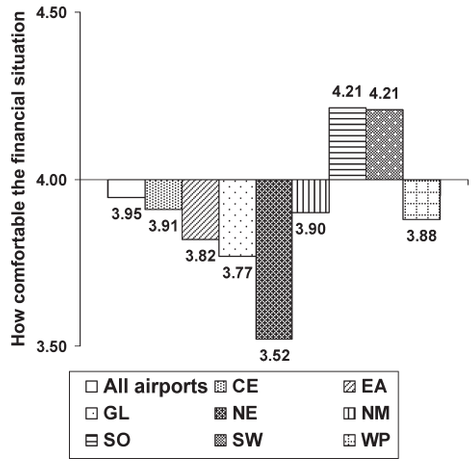

Figure 2 Overall financial situation of general aviation airports by FAA region
CE, Central Region; EA, Eastern Region; GL, Great Lakes Region; NE, New England Region; NM, North-west Mountain Region; SO, Southern Region; SW, South-west Region; WP, Western Pacific Region

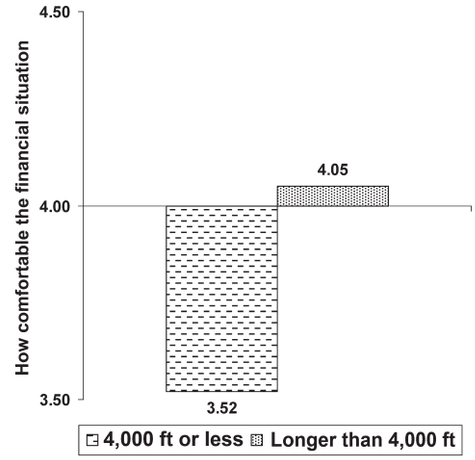

Figure 3 Overall financial situation of general aviation airports with respect to runway length

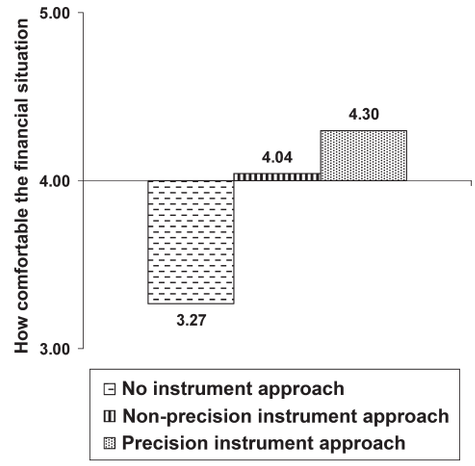

Figure 4 Overall financial situation of general aviation airports with respect to instrument approach procedure

on average financially better than those airports without instrument approaches. In addition, those airports with precision instrument approaches seem to have an advantage over those with non-precision instrument approaches only.

Figures 5 and 6 present differences in perception among general aviation airport managers with respect to the number of based aircraft and number of annual operations. In both cases, the more aircraft based at the airport and more operations (ie take-offs and landings) handled at the airport, the better the perception of the financial situation. The positive differences between the fourth quartile and the other three quartiles are statistically significant in each case for both based aircraft and operations. The negative differences for first quartile airports are also statistically significant for both cases. The decreases in the third quartiles are not statistically significant, suggesting that the airports in the second and third quartiles are similar considering their financial situation.

As presented in Figure 7, the data suggest that general aviation airports located in the south-west, New England, southern and western Pacific regions are more likely to be non-subsidised than the cohorts in other regions exceeding the national average of 26 per cent. More than 40 per cent of general aviation airports from the western Pacific region reported that they are not subsidised.

Figures 8 and 9 illustrate the percentage of non-subsidised airports according to the number of based aircraft and estimated number of annual operations. As expected, there are significantly higher proportions of non-subsidised airports in

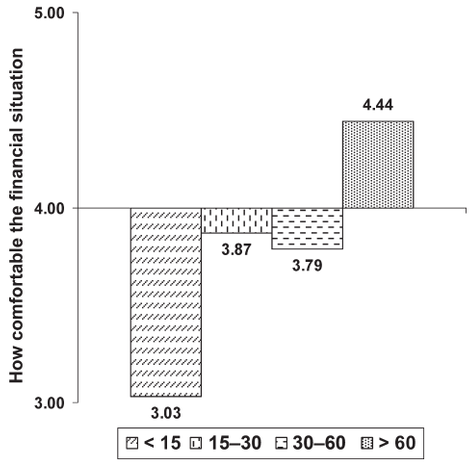

Figure 5 Overall financial situation of general aviation airports according to number of based aircraft

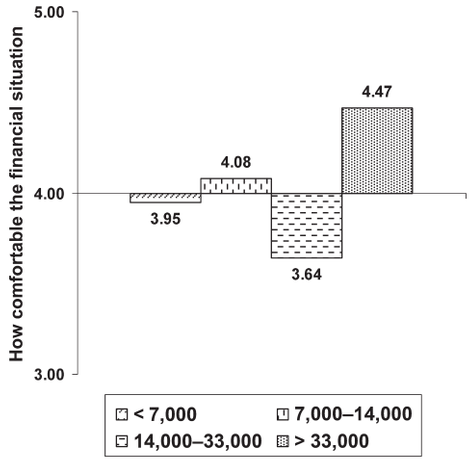

Figure 6 Overall financial situation of general aviation airports according to number of annual aircraft operations

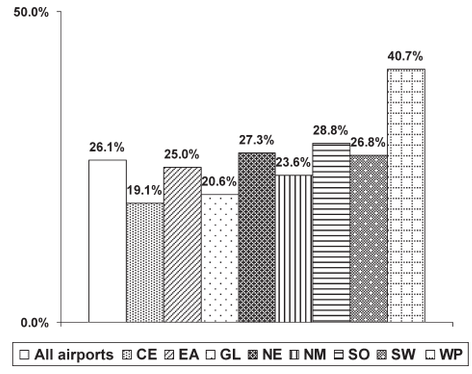

Figure 7 Percentage of non-subsidised general aviation airports in different FAA regions
CE, Central Region; EA, Eastern Region; GL, Great Lakes Region; NE, New England Region; NM, North-west Mountain Region; SO, Southern Region; SW, South-west Region; WP, Western Pacific Region

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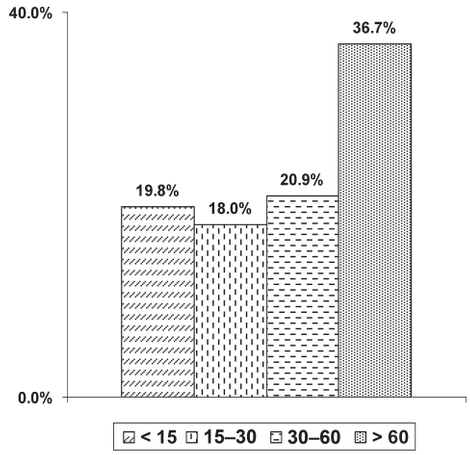

Figure 8 Percentage of non-subsidised general aviation airports according to number of based aircraft

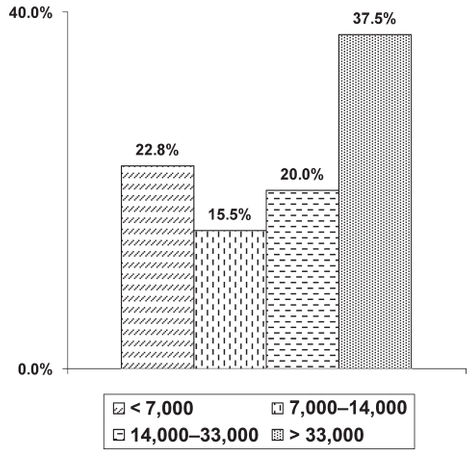

Figure 9 Percentage of non-subsidised general aviation airports according to number of annual aircraft operations

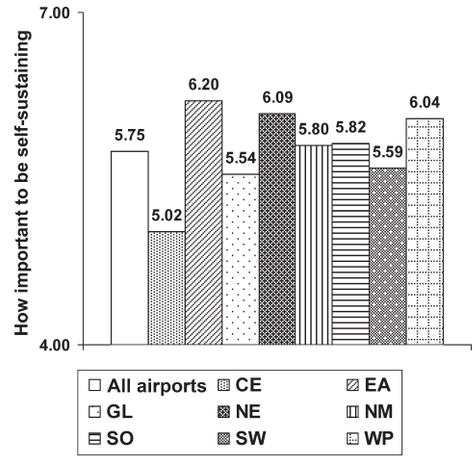

Figure 10 Perceived importance for general aviation airports being self-sustaining
CE, Central Region; EA, Eastern Region; GL, Great Lakes Region; NE, New England Region; NM, North-west Mountain Region; SO, Southern Region; SW, South-west Region; WP, Western Pacific Region

the quartiles with the highest number of based aircraft and the highest number of annual operations.

Examination of differences among general aviation airports with precision or non-precision instrument approach procedures, or those without instrument approach procedures, indicates that the differences are not statistically significant, suggesting that all three groups have similar proportions of non-subsidised airports.

As presented in Figure 10, a majority of general aviation airport managers understand the importance of their airports being self-sustaining. Across the FAA regions, the lowest (but still positive) response is from the central region. General aviation airport managers from the eastern region assign the highest importance to self-sustainability.

To assess whether general aviation managers' education influences their perception of the importance of being self-sustaining, the sample was subdivided according to manager's level of education and with respect to holding a college degree related to business or management. The results are presented in Figures 11 and 12. It appears that the higher the educational level of the airport manager, the more important they feel it is for the airport to be self-sustaining. In addition, managers with a business-related degree consider being self-sustaining to be more important than their counterparts without a business-related degree. The differences between managers with a college degree and without a college degree and between managers with a business-related

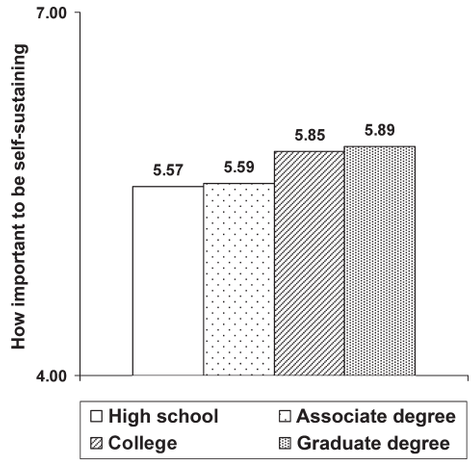

Figure 11 Perceived importance for general aviation airports to be self-sustaining according to manager's education level

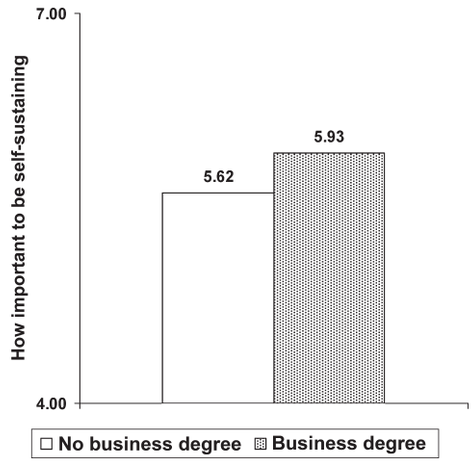

Figure 12 Perceived importance for general aviation airports to be self-sustaining according to manager's business-related degree

degree and without a business-related degree are both statistically significant.

The rationale for including the question about the general aviation airport manager's perception of how the community views their airport is to assess the importance or priority of the airport to the surrounding communities. In addition, subdividing the sample according to FAA regions provides some insights into the differences in general aviation airports and community relations in different parts of the country. The results are presented in Figure 13.

The analysis suggests that communities in general see general aviation airports more as an asset than a liability. However, there are some differences among regions. For example, general aviation airports in the New England and central regions appear to be perceived as less valuable by their communities than in the north-west mountain, southern and south-west regions. Simple correlation analysis between the community perception and financial situation of general aviation airports indicates a statistically significant positive correlation of 0.4. This suggests that better relationships with surrounding communities usually lead to better financial situations for general aviation airports.

As illustrated in Figures 14 and 15, a majority of airport managers believe that they are provided with sufficient funds from both the FAA and their respective state. However, the response is somewhat higher for FAA funding (4.52) versus state funding (4.23). In addition, the analysis by FAA

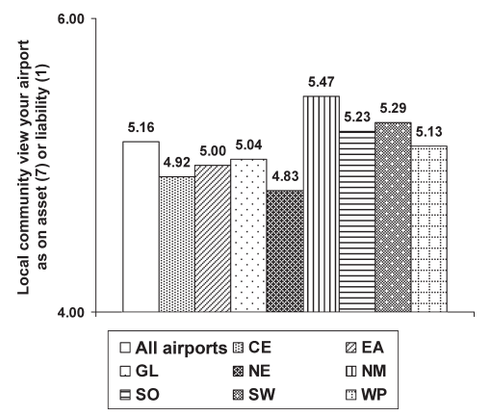

Figure 13 Community view of general aviation airports CE, Central Region; EA, Eastern Region; GL, Great Lakes Region; NE, New England Region; NM, North-west Mountain Region; SO, Southern Region; SW, South-west Region; WP, Western Pacific Region

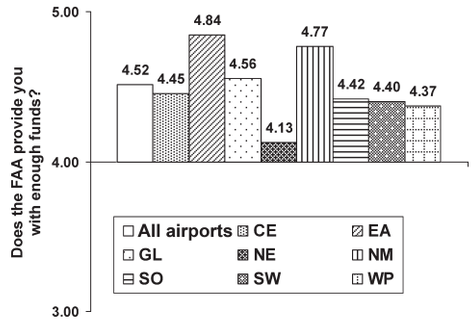

Figure 14 Perception of financial support from FAA
CE, Central Region; EA, Eastern Region; GL, Great Lakes Region; NE, New England Region; NM, North-west Mountain Region; SO, Southern Region; SW, South-west Region; WP, Western Pacific Region

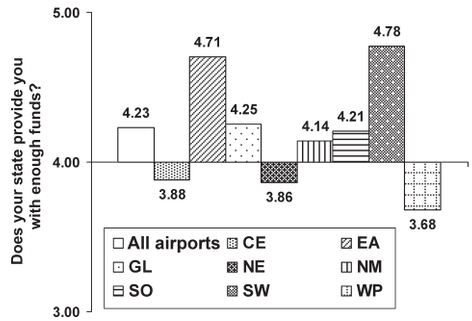

Figure 15 Perception of financial support from state
CE, Central Region; EA, Eastern Region; GL, Great Lakes Region; NE, New England Region; NM, North-west Mountain Region; SO, Southern Region; SW, South-west Region; WP, Western Pacific Region

region reveals some geographic differences. While the perception of financial support from the FAA is not significantly different from one region to another, the financial support by corresponding states seems to be significantly lower in the central, New England and western Pacific regions.

Interestingly, a correlation analysis between the financial situation of a general aviation airport and financial support from the FAA and state indicates that they are positively correlated with statistically significant coefficients of 0.29 and 0.31, respectively. This suggests that FAA and state support are important elements in the financial health of a general aviation airport.

The rationale for including the question about other funding sources (bank loans, private sector funds, etc) in the survey is to assess the extent to which general aviation airport managers are familiar with non-governmental funding sources and, if familiar, the degree to which they use them. Even though all general aviation airports have access to a variety of alternative funding sources to FAA, state and/or local government funds, only 47 per cent of managers responded that they access such funds. Those general aviation airport managers who are familiar with alternative funding sources, are apparently willing and able to employ these resources, as indicated by 71 per cent of managers from the corresponding group.

General aviation airport managers were asked to indicate the importance of each of the following revenue sources to the financial health of their airports: fuel sales, ground leases, landing fees, hangar fees and other revenue sources. An opportunity for providing additional non-listed sources of revenue was offered, some of the 'other' sources of revenue indicated by general aviation airport managers were: car shows, tie-down fees, timber sales from airport property, defence fuel contracts, farm ground rental, commercial development, maintenance, airport access fees, agriculture/farming, flight training, residential and commercial property leases on and off-airport, aircraft property taxes, fixed-base operator fees, concession revenues, royalties from gas wells, parking fees, ground support services, oil revenue and royalties from wells on airports, user fees (eg banner towing), aircraft registration fees, snow removal fees, camp grounds, high-altitude aircraft testing, special events, donations and volunteer labour. Figure 16 illustrates the importance

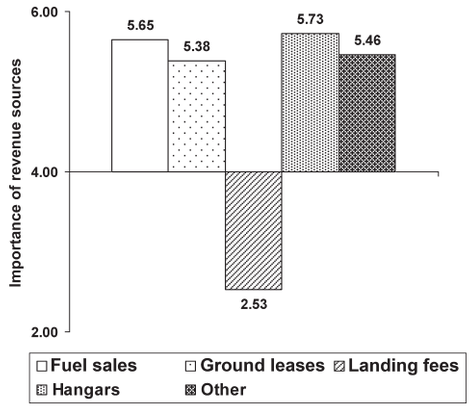

Figure 16 Importance of different revenue sources for general aviation airports

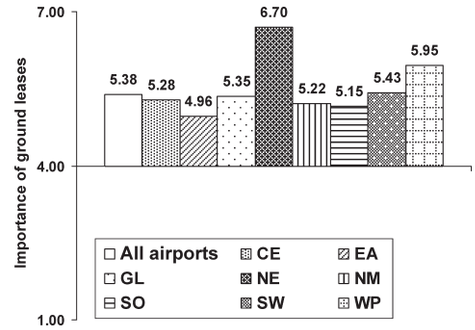

Figure 18 Importance of ground leases for general aviation airports
CE, Central Region; EA, Eastern Region; GL, Great Lakes Region; NE, New England Region; NM, North-west Mountain Region; SO, Southern Region; SW, South-west Region; WP, Western Pacific Region

of different revenue sources for general aviation airports.

Respondents overwhelmingly reported fuel sales and hangar leases to be the most important sources of revenues for general aviation airports. Ground leases and other sources followed closely behind fuel sales and hangar leases. Landing fees were ranked very low (2.53 out of 7) in their importance for general aviation airports. ANOVA indicates statistically significant differences in the importance of these revenue sources across the FAA regions. As illustrated in Figures 17–21, fuel sales are considered least important for the

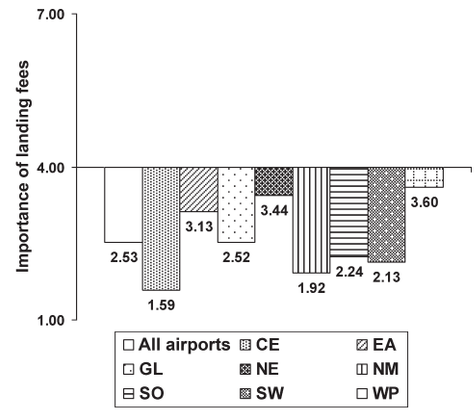

Figure 19 Importance of landing fees for general aviation airports
CE, Central Region; EA, Eastern Region; GL, Great Lakes Region; NE, New England Region; NM, North-west Mountain Region; SO, Southern Region; SW, South-west Region; WP, Western Pacific Region

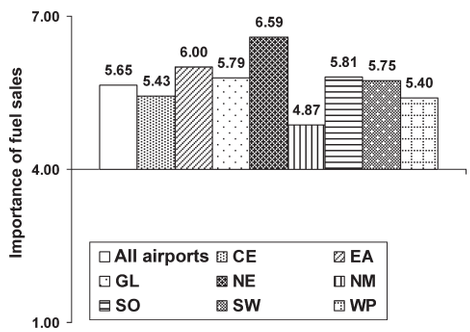

Figure 17 Importance of fuel sales for general aviation airports
CE, Central Region; EA, Eastern Region; GL, Great Lakes Region; NE, New England Region; NM, North-west Mountain Region; SO, Southern Region; SW, South-west Region; WP, Western Pacific Region

north-west mountain region, but the most important for the New England region. Ground leases are reported to be less important for the eastern region, but very important for New England. Hangar leases represent one of the most important revenue sources for the eastern and New England regions, but are not considered very important in the north-west mountain region.

Specific enquiries regarding the demand for T-hangars (ie multiple or

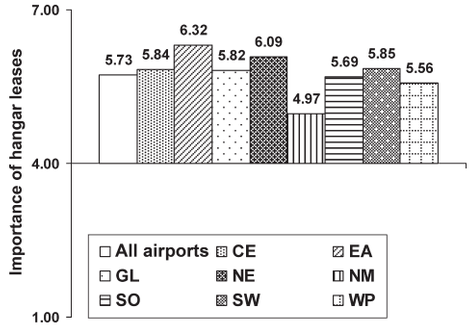

Figure 20 Importance of hangar leases for general aviation airports
CE, Central Region; EA, Eastern Region; GL, Great Lakes Region; NE, New England Region; NM, North-west Mountain Region; SO, Southern Region; SW, South-west Region; WP, Western Pacific Region

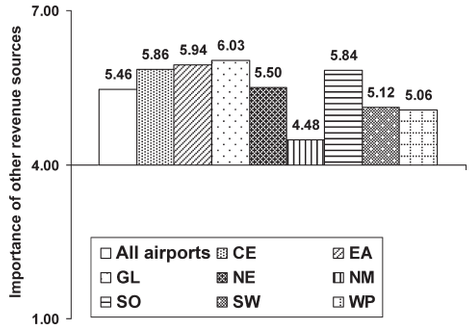

Figure 21 Importance of other revenue sources for general aviation airports
CE, Central Region; EA, Eastern Region; GL, Great Lakes Region; NE, New England Region; NM, North-west Mountain Region; SO, Southern Region; SW, South-west Region; WP, Western Pacific Region

single T-shaped buildings capable of housing one or more aeroplanes) were included in the questionnaire because of their relative importance as a source of revenue for general aviation airports. About 70 per cent of general aviation airport managers (386 airports) indicated that they have a waiting list for T-hangars. The total number of T-hangar units was 7,034 units, with a mean of 26.2 T-hangars per general aviation airport with a waiting list. As the sample includes about 25 per cent of general aviation airports, the nationwide demand can be calculated as approximately 28,136 T-hangar units. The southern and Great Lakes regions have the highest number of general aviation airports with waiting lists, while the central and north-west mountain regions have a relatively lower number of airports with waiting lists. With respect to the actual number on the lists, however, the western Pacific region responses demonstrate the highest unsatisfied demand for T-hangars, while the central and New England region managers indicate the lowest unsatisfied demand for T-hangars.

Fuel sales practices at general aviation airports were also investigated. The majority of respondent airports (61 per cent) handle fuel sales through fixed-base operators (FBOs), an airport-based business that services, fuels, stores, and often repairs and rents aircraft and provides flight training. About one-third of the surveyed airports handle fuel sales themselves, while concurrent sales by airport and FBOs account for about 3 per cent of respondents. Another 3 per cent of airports reported fuel sales were handled through third-party providers. About 76 per cent of general aviation airports with FBOs have only one FBO on the field, while 19 per cent have two FBOs. Five per cent of airports reported having more than two FBOs.

The investigation regarding fuel flowage fees (ie fees charged by the state and/or local municipality per gallon of fuel sold at the airport) reveals somewhat interesting results. Forty-three general aviation airports (15 per cent) that handle fuel sales through FBOs do not charge any sort of fuel flowage fee. A plausible explanation is that some fixed fuel fees are likely to be included in the FBO lease contracts at these airports. With respect to airports with FBOs that charge fuel flowage fees, the fees range from \$0.01 to \$0.85 per gallon, with a mean of \$0.076. With

respect to fuel flowage fees at the airports with privately owned fuelling systems, the results are even more surprising: 76 general aviation airports (45 per cent) with private fuel tanks in the sample do not charge fuel flowage fees. Other airports charge operators of privately owned fuelling systems flowage fees of $0.094 per gallon on average, with a minimum of $0.005 and maximum of $0.75. The distribution of fuel flowage fees among the sample is presented in Figures 22 and 23.

Open-ended survey questions were included to collect general aviation airport managers' perceptions about improvements that can be employed to attract more revenues and the amount of funding needed for such improvements. In summary, general aviation airport managers believe that more T-hangars, longer runways, better instrument approaches, commercial developments, land leases, new terminals, airport-based restaurants, locating non-aviation business at or near airports and better marketing can help general aviation airports generate more revenue. Of the respondent airport managers, 359 (61 per cent) provided estimates of funds needed to proceed with these improvements. The estimates ranged from $1,000 to $105m. On average, a general aviation airport needs about $4.3m to proceed with improvements which, according to the airport managers, will attract much needed revenues. The aggregate amount of funding estimated by the 359 general aviation airport managers was $1.55bn. If this figure is generalised to all 2,288 general aviation airports in the eight FAA regions, the funding requirements become approximately $6–9.9bn. Assuming that the 230 airport managers who did not provide funding estimates do not need funds, the estimate is on the low side of the range. Assuming that those managers are still in need of funds but were having difficulties providing estimates, the figure becomes $9.9bn.

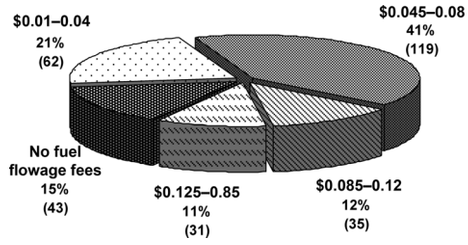

Figure 22 Fuel flowage fees at general aviation airports with fixed-based operators

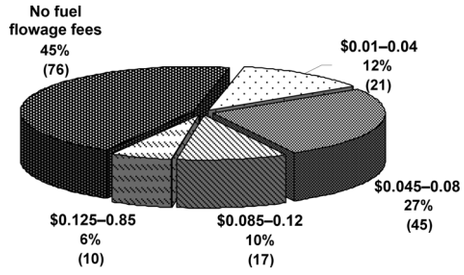

Figure 23 Fuel flowage fees at general aviation airports with privately owned fuelling systems

STATISTICAL ANALYSIS

Collected data were used to examine statistically significant differences for subsidised and non-subsidised general aviation airports. In addition, variables that affect the financial situation of general aviation airports were analysed by estimating ordinary least square regressions for two dependent variables: financial situation and importance of being self-sustaining.

Statistically significant differences between subsidised and non-subsidised airports

T-test analyses were used to identify the statistically significant differences between subsidised and non-subsidised airports with respect to the characteristics of airports and their managers.

Table 4 Statistically significant differences between subsidised and non-subsidised general aviation airports

Variables	*Average value* *Subsidised airports*	*Non-subsidised airports*
Importance of being self-sustaining	5.54	6.27
Importance of revenue from ground leases	5.22	5.92
Average number in waiting list for T-hangars	20	44
Average fuel flowage fees	$0.06	$0.10
Average number of based aircraft	71	126
Average number of annual aircraft operations	35,973	55,371

Only statistically significant differences between subsidised and non-subsidised general aviation airports and their managers are presented in the table. Importance of being self-sustaining and importance of revenue from ground leases are provided by general aviation airport managers on a scale from 1 to 7. Numbers in waiting list for T-hangars are provided by general aviation airport managers in T-hangar units. Numbers of annual aircraft operations are provided by general aviation airport manager and denote take-offs and landings.

As presented in Table 4, managers of general aviation airports that are not subsidised are more likely to assign a higher score to the importance of being self-sustaining than managers of airports that are subsidised. In addition, managers of airports that are not subsidised are more likely to consider revenues from ground leases as very important compared with those managing subsidised airports. In addition, non-subsidised airports have more than twice the average number on their waiting lists for T-hangars than subsidised ones. Non-subsidised airports seem to charge more for fuel flowage with average fuel flowage fees of $0.10, while subsidised airports charge only $0.06 on average. In addition, non-subsidised airports have significantly more based aircraft and annual operations.

Regression analyses

Two standard multiple regression analyses were conducted to determine the importance of the independent variables characterising a general aviation airport and/or airport manager in explaining the financial situation of an airport. The first regression uses airport characteristics as independent variables. Equation 1 presents the regression model employed:

$$SITUAT_i = a + b_1 RW_i + \sum_{j=2}^{4} b_j BASED_{j,i} + \sum_{j=5}^{7} b_j OPS_{j-3,i} + b_8 INS\_APP_i + b_9 POP + b_{10} SOUTH_i + b_{11} NEW\_ENG_i + e_i$$

Here, *SITUAT* represents the financial situation at a general aviation airport as indicated by the airport manager (on a scale from 1 to 7); *RW* is coded 1 for airports with a runway of 4,000 feet and longer and 0 for airports with a runway shorter than 4,000 feet; *BASED* denotes the number of based aircraft, $BASED_2$ is coded 1 for quartile 2 (15–30 aircraft) and 0 otherwise, $BASED_3$ is coded 1 for quartile 3 (30–60 aircraft) and 0 otherwise, and $BASED_4$ is coded 1 for quartile 4 (>60 aircraft) and 0 otherwise; *OPS* represents the number of annual aircraft operations, OPS_2, OPS_3 and OPS_4 are coded 1 for the corresponding quartiles; *INS_APP* is coded 1 for an airport with an instrument approach and 0 for an airport without instrument approach; *POP* is the

population of a county where the airport is located (based on 2003 estimates published by the US Census Bureau); *SOUTH* is coded 1 for general aviation airports from the southern and south-west FAA regions and 0 otherwise; and *NEW_ENG* is coded 1 for an airport from the New England FAA region and 0 otherwise. The rationale for this final coding is because analysis of airport manager responses suggests that the financial situation of airports located in the New England and southern and south-west FAA regions can be different from the rest of the country.

Data screening, evaluation of linearity and normality led to the conclusion that all data observations were valid and no transformation was needed to satisfy standard regression assumptions. Parameter estimates for Equation 1 are presented in Table 5.

After controlling for other airport-specific characteristics, it appears that runway length is not significant, suggesting that general aviation airports with longer runways do not have a financial advantage compared with airports with runways shorter than 4,000 feet. However, the significant coefficients of

Table 5 Regression analysis for financial situation using general aviation airport-specific characteristics as independent variables

	Coefficient	*Standard error*	*T-statistics*	*Significance*
Constant	2.727***	0.330	8.262	0.000
RW	–0.023	0.176	–0.132	0.895
BASED2	0.495**	0.235	2.105	0.036
BASED3	0.546**	0.248	2.203	0.028
BASED4	0.916***	0.274	3.338	0.001
OPS2	0.315	0.217	1.455	0.146
OPS3	–0.214	0.210	–1.020	0.308
OPS4	0.268	0.238	1.129	0.259
INS_APP	0.542***	0.171	3.169	0.002
POPUL	0.000	0.000	0.562	0.575
SOUTH	0.399***	0.140	2.846	0.005
NEW_ENG	–0.310	0.339	–0.917	0.360

This table presents the estimates of the standard multiple regression analysis described by the model:

$$SITUAT_i = a + b_1 RW_i + \sum_{j=2}^{4} b_j BASED_{j,i} + \sum_{j=5}^{7} b_j OPS_{j-3,i} + b_8 INS\_APP_i + b_9 POP + b_{10} SOUTH_i + b_{11} NEW\_ENG_i + e_i$$

where *SITUAT* represents the financial situation at a general aviation airport as indicated by the airport manager (on a scale from 1 to 7); *RW* is coded 1 for airports with a runway of 4,000 feet and longer and 0 for airports with a runway shorter than 4,000 feet; *BASED* denotes the number of based aircraft, $BASED_2$ is coded 1 for quartile 2 (15–30 aircraft) and 0 otherwise, $BASED_3$ is coded 1 for quartile 3 (30–60 aircraft) and 0 otherwise, and $BASED_4$ is coded 1 for quartile 4 (>60 aircraft) and 0 otherwise; *OPS* represents the number of annual aircraft operations, OPS_2, OPS_3 and OPS_4 are coded 1 for the corresponding quartiles; *INS_APP* is coded 1 for an airport with an instrument approach and 0 for an airport without instrument approach; *POP* is the population of a county where the airport is located; *SOUTH* is coded 1 for general aviation airports from the southern and south-west FAA regions and 0 otherwise; and *NEW_ENG* is coded 1 for an airport from the New England FAA region and 0 otherwise. Statistical significance at the 5 per cent and 1 per cent level is indicated by **, or ***, respectively.

based aircraft, instrument approach and regional location indicate that airports with more based aircraft, a published instrument approach procedure and those located in the southern and south-west FAA regions are more likely to do better financially than their counterparts.

Another multiple regression was conducted using perception and importance variables as independent variables. The model is presented in Equation 2:

$$SITUAT_i = a + b_1 COMVIEW_i + b_2 FAAF_i + b_3 STATEF_i + b_4 FUEL_i + b_5 GRLEASE_i + b_6 HANGAR_i + b_6 OTHER_i + e_i$$

Here, *SITUAT* represents the financial situation at a general aviation airport as indicated by the airport manager (on a scale from 1 to 7); *COMVIEW* represents the airport manager's perception of how the community views the airport (liability or asset on a scale from 1 to 7); *FAAF* indicates the airport manager's perception that the FAA provides the airport with enough funding (on a scale from 1 to 7); *STATEF* indicates the airport manager's perception that the state provides the airport with enough funding (on a scale from 1 to 7); *FUEL, GRLEASE*, *HANGAR*, *OTHER* are important revenue sources for an airport (fuel sales, ground leases, hangar leases and others, using a scale from 1 to 7).

Parameter estimates for Equation 2 are presented in Table 6. Only three variables were found to contribute significantly to the financial situation of general aviation airports: community view, fuel and T-hangar revenues. These findings suggest that airport-community relationships are very important for the financial wellbeing of general aviation airports. In addition,

Table 6 Regression analysis for financial situation using perception and importance variables as independent variables

	Coefficient	*Standard error*	*T-statistics*	*Significance*
Constant	1.593**	0.666	2.393	0.018
COMVIEW	0.345***	0.084	4.132	0.000
FAAF	0.008	0.095	0.088	0.930
STATEF	0.076	0.085	0.899	0.371
FUEL	0.174**	0.086	2.014	0.046
GRLEASE	0.064	0.071	0.899	0.371
HANGARS	0.215**	0.090	2.394	0.018
OTHER	0.028	0.069	0.402	0.689

This table presents the estimates of the standard multiple regression analysis described by the model:

$$SITUAT_i = a + b_1 COMVIEW_i + b_2 FAAF_i + b_3 STATEF_i + b_4 FUEL_i + b_5 GRLEASE_i + b_6 HANGAR_i + b_6 OTHER_i + e_i$$

where *SITUAT* represents the financial situation at a general aviation airport as indicated by the airport manager (on a scale from 1 to 7); *COMVIEW* represents the airport manager's perception of how the community views the airport (liability or asset on a scale from 1 to 7); *FAAF* indicates airport manager's perception that the FAA provides the airport with enough funding (on a scale from 1 to 7); *STATEF* indicates airport manager's perception that the state provides the airport with enough funding (on a scale from 1 to 7); *FUEL, GRLEASE, HANGAR, OTHER* are important revenue sources for an airport (fuel sales, ground leases, hangar leases and others, using a scale from 1 to 7). Statistical significance at the 5 per cent and 1 per cent level is indicated by **, or ***, respectively.

the analysis confirms the importance of fuel and T-hangar revenue sources for general aviation airports.

As the managers of subsidised and non-subsidised airports showed a significant difference in their perception of the importance of being self-sustaining, another multiple regression analysis with manager-specific characteristics as independent variables was conducted. Equation 3 presents a model that attempts to identify manager characteristics associated with the perceived importance for a general aviation airport to be self-sustaining:

$$IMPSS_i = a + b_1 BUS\_TIME_i + \sum_{j=2}^{4} b_j EDUC_{j,i} + b_3 BUS\_DEG_i + e_i \quad (3)$$

Here, *IMPSS* is the perceived importance for a general aviation airport to be self-sustaining as indicated by airport managers on a scale from 1 to 7; *BUS_TIME* is the number of years a general aviation airport manager has been in the airport management field; *EDUC* denotes the manager's level of education; $EDUC_2$ is coded 1 for general aviation managers with associate degrees and 0 otherwise, $EDUC_3$ is coded 1 for managers with undergraduate college degrees and 0 otherwise, and $EDUC_4$ is coded 1 for managers with a graduate degree and 0 otherwise; *BUS_DEG* is coded 1 for managers with undergraduate or graduate degrees in business or a related discipline (eg management) and 0 otherwise.

Parameter estimates for Equation 3 are presented in Table 7. Only coefficient *BUS_DEG* was determined to be marginally statistically significant (at the 10 per cent level), indicating that managers with a degree in business assign higher importance to being self-sustaining, which consequently increases the likelihood of their airports being self-sustaining.

Table 7 Regression analysis for importance to be self-sustaining using manager-specific characteristics as independent variables

	Coefficient	*Standard error*	*T-statistics*	*Significance*
Constant	6.198***	0.413	15.012	0.000
BUS_TIME	0.003	0.008	0.369	0.712
EDUC2	–0.192	0.303	–0.631	0.528
EDUC3	0.005	0.292	0.018	0.985
EDUC4	0.011	0.303	0.035	0.972
BUS_DEG	0.257*	0.154	1.668	0.096

This table presents the estimates of the standard multiple regression analysis described by the model:

$$IMPSS_i = a + b_1 BUS\_TIME_i + \sum_{j=2}^{4} b_j EDUC_{j,i} + b_3 BUS\_DEG_i + e_i$$

where *IMPSS* is the perceived importance for a general aviation airport to be self-sustaining as indicated by airport managers on a scale from 1 to 7; *BUS_TIME* is the number of years a general aviation airport manager has been in the airport management field; *EDUC* denotes level of education of a manager; $EDUC_2$ is coded 1 for general aviation managers with associate degrees and 0 otherwise, $EDUC_3$ is coded 1 for managers with undergraduate college degrees and 0 otherwise, and $EDUC_4$ is coded 1 for managers with graduate degrees and 0 otherwise; *BUS_DEG* is coded 1 for managers with undergraduate or graduate degrees in business or a related discipline (eg management) and 0 otherwise.
Statistical significance at the 10 per cent and 1 per cent level is indicated by *, and ***, respectively.

PRACTICAL POLICY AND MANAGEMENT IMPLICATIONS

Some of the findings of this study are obvious but the research provides an evidential foundation and statistical analyses to support this information. One of the more important findings appears to be that most general aviation airports can be financially self-sustaining, regardless of their location, county population, etc as indicated by 26 per cent of the respondents.

The FAA has promulgated a national policy of encouraging all airports — general aviation airports included — to be financially self-sufficient and to rely 'primarily on user fees and placing minimal burden on the general revenues of the local, state, and federal governments'.[15] Congress, through legislation such as the Vision 100 Act, has supported this policy by making certain revenue-generating projects such as T-hangars and fuel systems eligible for federal AIP grants. In addition, Congress has provided publicly owned general aviation airports with an annual federal entitlement of $150,000 that can be used for such projects.

FAA policy, on the other hand, places a very low priority on these types of projects. As a result, the FAA restricts the use of the general aviation entitlements for revenue-generating projects until other projects with higher priorities (eg safety, standards, etc) have been completed. In these cases, the general aviation entitlement funds are applied first and supplemented with discretionary funds to finance these projects. In addition, discretionary federal funds, which are allocated based on national priorities and in competition among airports with high-priority projects, cannot be used for revenue-generating projects. As a result, very few revenue-generating projects have actually been accomplished using federal funds. The high cost of T-hangar construction projects and fuel systems generally exceeds the $150,000 annual entitlement and, while general aviation airports can accumulate up to three years of entitlements ($450,000 total), higher-priority projects will inevitably surface and require the airport to use its funds accordingly.

With the existing federal legislation authorising the general aviation entitlement set to expire, new legislation is currently being proposed and includes reauthorisation of the general aviation entitlement. The proposed legislation also includes increasing the amount of the general aviation entitlement, indexed on the number of based aircraft. Emphasis on legislating for the ability of sponsors of general aviation airports to use their entitlement for revenue-generating projects in deference to projects that require substantial funding through competitive funding sources may be appropriate.

The research also indicates that the attitudes of general aviation airport managers and their desires to operate their airports as businesses are among the most important components for achieving self-sufficiency. The development of educational programmes to assist airport managers in increasing their business skills, particularly in the field of real estate development, marketing and management, would be extremely helpful. The preparation of resource documents identifying non-traditional federal and state grants, loans and other financial assistance would be a useful means of helping many airport managers acquire a better understanding of the importance of these issues.

Opportunities exist in the preparation of new master plans for general aviation airports to scrutinise and refine operating budgets and capital improvement plans and to find means and methods for improving the financial performance of airports.

Another observation for consideration is for the FAA to improve the consistency of implementing national policies across its regional offices. Regional FAA offices appear to have differing attitudes towards the use of revenue-generating projects and the required level of information and analysis needed by airport sponsors to justify these types of project.

The FAA, as well as state aviation agencies, can strengthen the financial skills of their frontline airport representatives in supporting their constituent general aviation airport managers' efforts to improve financial performance.

To be successful in achieving financial self-sufficiency, the general aviation airport manager needs the support and assistance from their federal, state and local governments. At the same time, the position of the airport manager appears to be evolving from requiring a background in aviation towards having more business and real estate management skills. Increased emphasis in these areas should be considered in collegiate aviation management degree programmes.

CONCLUSION

Through a survey of airport managers, data about the financial situation of general aviation airports located in the 48 contiguous US states which are open for public use and included in the FAA database were collected and evaluated. As no centralised financial reporting system for general aviation airports is currently in effect, the data collected here provide unique insights into the determinants of the financial health of general aviation airports.

While it is much more difficult for general aviation airports to achieve self-sustainability than for commercial service airports, the large proportion of non-subsidised general aviation airports in the sample (26 per cent) suggests that general aviation airports can be self-sustaining. While it is easier to generate sufficient revenues for general aviation airports located in southern and south-west FAA regions, successful managers are able to operate without subsidies regardless of airport location.

Statistical analysis of collected data implies that a general aviation airport manager's attitude towards the importance of self-sustainability and manager-specific characteristics (eg a degree in a business-related field) are more important to the likelihood of a general aviation airport being self-sustaining than airport-specific characteristics (eg runway length, location, county population, etc). Moreover, an understanding of the importance of being self-sustaining is one of the main characteristics of a successful general aviation airport manager. A good relationship with the local community is another important contributor to the financial health of a general aviation airport.

In addition, general aviation airport rates, charges and sources of funds are found to be significantly different across FAA regions, states and individual airports. While longer runways do not appear to improve the financial status of general aviation airports, published instrument approach procedures, and a larger number of based aircraft appear to positively influence financial performance. In addition, non-traditional and non-aviation revenue sources (eg agriculture, industrial zones, etc) are often employed for improving the financial health of general aviation airports.

Airport managers cite hangar leases, fuel sales and ground leases as the most important revenue producers of general aviation airports. In addition, there is a strong demand for T-hangars reported at general aviation airports nationwide. As

indicated by respondents, approximately 70 per cent of general aviation airports have a waiting list for T-hangars, with a mean of 26.2 hangars per airport. Total demand for T-hangars for 588 respondent airports is 7,034, implying a nationwide demand for approximately 28,136 T-hangar units.

The estimates provided by airport managers suggest that the general aviation airports in the USA each need between $6bn and $9.9bn to proceed with the improvements that will enhance their revenue-generating potential in respect of the goal of achieving and/or maintaining financial self-sufficiency.

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(5) According to the FAA, commercial service airports are defined as public airports receiving scheduled passenger service and having 2,500 or more enplaned passengers per year. There are currently 510 commercial service airports in the USA. Reliever airports are high-capacity general aviation airports located in major metropolitan areas. They provide an alternative to utilising congested commercial service airports and also provide airport access to the local community in a broader metropolitan area. To be designated as a reliever, the airport must have more than 25,000 point-to-point operations per year and 100 or more based aircraft and, in addition, be located in a metropolitan area with at least 250,000 people. The FAA has designated 278 US airports as reliever airports. Other public airports outside these categorised classifications are general aviation airports.
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APPENDIX A: MANAGER INTERVIEW QUESTIONS

1. How do you describe the financial situation of your airport? (Comfortable revenue stream, etc.)
2. Are you self-sustaining financially?
3. Are you subsidised by the community, city, city council, country commission, or others? If yes, are the subsidies for operations, capital improvement projects, or both?
4. Do you or your council (airport authority board) think it is important to become (continue being) self-sustaining?
5. What do you think it would take to become self-sustaining?
6. Overall, how does your community view your airport? For example, are you thought of as an asset, liability, etc?
7. What are your current best revenue producers (fuel, landing fees, ground leases, hangar leases, etc)?
8. What improvements do you think are needed to attract more revenues to the airport?
9. How much do you think you will need to proceed with these improvements?
10. Does the FAA provide you with enough funding to meet your needs?
11. Does the state provide you with enough funding to meet your needs?
12. Do you have access to other funding sources for these improvements? Such as bank loans, private sector funds, etc?
13. Do you know any airport manager who does a really good job raising money for the airport?

Demographic information:

How long have you been the airport manager?

What did you do before that?

Do you have a business degree?

Do you have a pilot mechanics licence?

APPENDIX B: SURVEY INSTRUMENT

This survey is being conducted by XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX research team. The purpose is twofold: (1) to collect information about the financial environment of General Aviation (GA) airports and; (2) to ask for your opinions and preferences about potential ways to improve GA airport revenues. Please be as honest and accurate about your answers to this survey as possible. The data you provide will be held **strictly confidential**. At the conclusion of the study, we will share our findings with those who complete and return this questionnaire. If you have any questions or comments about the questionnaire and/or about the research project, please contact XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

Please respond to this survey on or before March 25, 2005

How do you describe the financial situation of your airport? (Comfortable revenue stream?)
Extremely Uncomfortable 1 2 3 4 5 6 7 Extremely Comfortable N/A

Are you subsidized by the city, county, or other government authority? _____ YES _____ NO _____ N/A
If "YES", are the subsidies for operations, capital improvement projects, or both? _____Operations _____ CIP _____ BOTH

Are you financially supported by a large (i.e., commercial) airport? _____ YES _____ NO _____ N/A

Do you or your council (commission, authority board) think it is important to be self-sustaining?
Extremely Unimportant 1 2 3 4 5 6 7 Extremely Important N/A

Overall, how does your community view your airport? (Asset or Liability)
Definitely as a Liability 1 2 3 4 5 6 7 Definitely as an Asset N/A

Do the FAA and your state provide you with enough funding to meet your needs?
FAA: Definitely NOT 1 2 3 4 5 6 7 Definitely YES N/A
STATE: Definitely NOT 1 2 3 4 5 6 7 Definitely YES N/A

Do you have access to other funding sources, such as bank loans, private sector funds, etc.?
_____ YES _____ NO _____ N/A
If "YES", have you used them? _____ YES _____ NO

Please indicate how important each of the following revenue sources is to the financial health of your airport

	Extremely Unimportant						Extremely Important	
FUEL SALES	1	2	3	4	5	6	7	N/A
GROUND LEASES	1	2	3	4	5	6	7	N/A
LANDING FEES	1	2	3	4	5	6	7	N/A
HANGAR LEASES	1	2	3	4	5	6	7	N/A
OTHER (Please, specify below)	1	2	3	4	5	6	7	N/A

_____

Do you have a waiting list for T-hangars at your airport? _____ YES _____NO _____ N/A
If "YES", approximately how many are on the list? _____

Does your state participate in funding T-hangar development? _____ YES _____ NO _____ N/A
If "YES", at what percentage or maximum amount? _____

One method for potentially enhancing revenue at GA airports is for the Airport Owner (rather than the private sector) to provide T-hangar facilities for rent. How attractive is this concept for application at your airport?
Extremely Unattractive 1 2 3 4 5 6 7 Extremely Attractive N/A

If adequate federal and/or state funding were available, how easy do you think this concept would be to implement at your airport? (Consider political, financial, and implementation issues)
Extremely Difficult 1 2 3 4 5 6 7 Extremely Easy N/A

How are your public aviation fuel sales handled?
_____ FBO If so, how many operators? _____ What is your Fuel flowage fee? _____
_____ Third party provider (Please, specify _____)
_____ Airport (_____Exclusively; _____ Self-service; _____ AvGas; _____ Jet "A")

Continue on other side

Do you have privately owned fueling systems (i.e., corporate tanks) at the airport? _____ YES _____ NO _____ N/A
If "YES", do you charge a fuel flowage fee? _____ YES _____ NO
If "YES", what is your fuel flowage fee rate? _____

Another method for potentially enhancing revenue at GA airports is for the Airport Owner (rather than the private sector) to provide fuel sales exclusively (e.g., self-service fueling). How attractive is this concept for application at your airport?
Extremely Unattractive 1 2 3 4 5 6 7 Extremely Attractive N/A

If adequate federal and/or state funding were available, how easy do you think this concept would be to implement at your airport? (Consider political, financial, and implementation issues)
Extremely Difficult 1 2 3 4 5 6 7 Extremely Easy N/A

In general, what improvements do you think are needed to attract more revenues to the airport?
_____ N/A
_____
_____

How much do you think you will approximately need to proceed with these improvements? $_____ N/A

Considering a typical GA airport, what do you think it would take to become (continue being) self-sustaining?
_____ N/A
_____
_____
_____
_____
_____

Please provide the following information about your airport:

Your state is: _____ **The FAA identifier of your airport is:** _____ (optional)

Length of the longest runway of your airport is _____ 4,000 feet or more _____ Less than 4,000 feet

Does your airport have a published instrument approach procedure? _____ YES _____ NO
If "YES", it is _____ Non-precision Instrument Approach _____ Precision Instrument Approach

Total number of aircraft based at your airport is approximately: # _____

Total number of annual operations at your airport is approximately: # _____

Please provide the following information about you:

How long have you been the manager of this airport? _____ years

How long have you been in the airport management? _____ years

What was your previous position/occupation? _____ N/A

What is the highest level of your formal education?
_____ High school _____ Associate degree _____ Undergraduate degree _____ Graduate degree

Is your degree in Business Administration/Management field? _____ YES _____ NO _____ N/A

Do you have a pilot license? _____ YES _____ NO **Do you have a mechanic license?** _____ YES _____ NO

Are you interested in receiving results of this study? _____ YES _____ NO
If "YES", please provide your mailing address _____
_____
_____
_____

Thank you very much for participating!