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# Entrepreneurial Spirit in Government Managed Enterprises: Evidence from the U.S. General Aviation Airports

Vitaly S. Guzhva

*Embry-Riddle Aeronautical University, guzhvav@erau.edu*

Massoud Bazargan

*Embry-Riddle Aeronautical University, bazargam@erau.edu*

David A. Byers

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**ENTREPRENEURIAL SPIRIT IN GOVERNMENT MANAGED  
ENTERPRISES: EVIDENCE FROM THE U.S. GENERAL AVIATION  
AIRPORTS**

Vitaly S. Guzhva, Massoud Bazargan and David A. Byers\*

**ABSTRACT.** While a number of studies introduce entrepreneurship in the public sector, there is still a need for empirical research in this field. We use a survey of U.S. general aviation airport managers to investigate the benefits of entrepreneurial spirit in public sector management. The results of logistic regressions suggest that the airport managers' beliefs in importance of self-sustainability significantly improve the likelihood of general aviation airports to be self-sustaining. On the other hand, the airport specific characteristics, such as a favorable location, county population, and others are not statistically significant in achieving self-sustainability. Our findings support the literature that argue that entrepreneurship can be a mean of achieving more efficient, flexible and adaptive management in the public sector.

**INTRODUCTION**

Since 1980, nonprofit organizations are being urged to take a "social entrepreneurship" approach to add income ventures to offset cash shortfalls due to lower donation or grant and contract revenues (Zietlow, 2001). There is an extensive discussion in the literature about the need for alternative frameworks to guide the management

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\* *Vitaly S. Guzhva, Ph.D., and Massoud Bazargan, Ph.D., are Assistant Professor and Professor respectively, College of Business, Embry-Riddle Aeronautical University. David A. Byers, Ph.D., is an Associate Professor, College of Aeronautics, Florida Institute of Technology. Guzhva's research interests are in airport and airline finance, airline economics, investments, and financial risk management. Bazargan's research interests are in airline and airport operations, aviation scheduling, optimization and simulation. Byers's research interests are in airport development, economics, and airport management career development.*

of public sector organization. Moddy's (1994), Osborne and Gaebler (1992) and others underline a need to introduce to the public sector market-related mechanisms, such as competition, market segmentation, customer focus, and user fees. Bellone and Goerl (1992), and Doig and Hargrove (1987) launch the term "public sector entrepreneurship" and call for the development of creative, risk-taking cultures inside of public organizations. Morris and Jones (1999) also argue that entrepreneurship is a universal construct and can be applied in public sector organizations. Osborne (1993) observes that all levels of U.S. government are changing from rigid, wasteful, centralized bureaucracies to the more flexible, entrepreneurial, and decentralized organizations.

Entrepreneurship is often called as a means of achieving more efficient, flexible, and adaptive management in the public sector that leads to extensive innovations (Wart, 1995; Moon, 1999). Lynch and Lynch (1997) argue that the twenty-first century appears to be starting with a new budget reform – entrepreneurial budgeting. However, Rainey and Steinbauer (1999) point out that there is considerable evidence that many government organizations perform very well in spite of their inherited problems such as being too bureaucratic, with too little innovativeness and energy, too much hierarchy, red tape, spending, etc.

Guzman-Cuevas (1994) summarizes the economic and other social science literature that points out different entrepreneurial functions, such as the capitalist or financial function, the managerial function, and the booster function. The capitalist or financial function is performed by the entrepreneur when he or she supplies capital to the enterprise, while the managerial function consists of direction, organization, negotiation, and controlling the operations of the venture. The booster function implies the adoption of a series of essential initiatives to initiate enterprise, help it survive the market forces and achieve expansion. Santos and Alcalde (2002) argue that contrary to the financial and managerial functions, the booster function has a dynamic character, it is very difficult to formalize, and depends on the qualities – both psychological and sociological of the entrepreneur. The booster function drives strategic decisions (e.g., new investment projects, innovations in products and processes) and is essential in improving the competitiveness of the enterprise. It is

the booster function where the entrepreneurial spirit lies (Santos and Alcalde, 2002).

While a number of interdisciplinary studies introduce entrepreneurship in the public sector, there is still a need for empirical studies about the subject (Moon, 1999). In this study U.S. general aviation (GA) airports are used to empirically investigate the benefits of the entrepreneurial spirit in public sector management. Since the booster function of an entrepreneur depends basically on his or her psychological and sociological characteristics, our measure of the entrepreneurial spirit is a combination of such characteristics of a GA airport manager with the desire to achieve self-sustainability in traditionally subsidized environment assumed to be one of the most important entrepreneurial qualities of a manager.

Using logistic regression analysis, we find that airport manager attitudes and attributes, specifically their perceived importance for GA airports to be self-sustaining, significantly improve chances of GA airports for non-subsidized operations. Surprisingly, the airport specific characteristics, such as the favorable location, county population, etc., turn out to be not as important statistically as airport managers' beliefs in achieving self-sustainability.

### **U.S. GENERAL AVIATION AIRPORTS**

The United States accounts for nearly 50 percent of all general aviation activity in the world (FAA, 2004). General aviation is typically classified as the operation of civilian aircraft for purposes other than commercial passenger transport, including personal, business, recreational and instructional flying. To support this activity, communities throughout the U.S. have established, developed, and are maintaining airports, which provide access to the national air transportation system.

The majority of GA airports in the US are owned and operated by a municipality such as a small city or town, or a county. Historically, these airports have not generated enough in excess revenues to warrant special attention by the governing body as anything other than a public service of the local government. For GA airports that manage to generate excess revenues on a regular basis, the airport is more likely to be treated as an enterprise activity of the municipality. In most all cases, GA airport managers generally are not given any

special authority to set up creative deals nor are they offered additional compensation (e.g., bonuses) to provide incentives for improving the airport's financial performance. As a result, there is little motivation for managers to take extraordinary efforts or in an entrepreneurial sense, to take the necessary financial risks to substantially improve the airport's revenues and thus achieve the extrinsic rewards of success.

This situation can be attributed to the observation that municipally-owned GA airports are operated in a political environment, with inherent pressures created by elected officials, politically connected tenants and the ennui of a disinterested general public. In the absence of a strong political sponsor to aid in overcoming the obstacles of passive indifference or from tenant activists pushing an agenda to avoid reasonable rent increases, there is no incentive for an airport manager to fight against neutral or negative forces.

Financially, the typical GA airport operates at a slight operating deficit and usually requires a subsidy for the governing body to match the local share of federal- and state-assisted airport improvement projects. At the same time, unless the airport is located in a state that has a robust airport development funding program, there are usually no local funds available to develop the type of projects needed to provide additional revenue streams.

In contrast to this prevailing environment, the FAA is promulgating a national policy encouraging all airports— GA 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” (FAA, 2006). With commercial service airports, large numbers of based aircraft (tenants), landing fees, terminal rents, extensive developable real estate for non-aeronautical purposes, and other assets, financial self-sufficiency is not an issue. However, at smaller airports with less extensive facilities and supporting activity, achieving self-sufficiency is much more difficult.

Congress has supported the FAA policy by making certain revenue generating projects for GA airports such as aircraft hangars and fuel systems eligible for federal Airport Improvement Program (AIP) grant assistance. In addition, Congress has provided publicly owned GA airports with an annual federal entitlement of \$150,000 that can be

used for such projects. Ironically, another FAA policy places a very low priority on these types of projects and as a result, the use of the GA entitlements for revenue generating project is restricted until other projects with higher priorities (i.e., safety, standards, etc.) have been completed. In addition, the airports cannot receive federal discretionary funds to finance revenue generating projects and to support the operation and administration of the airports.

U.S. airport development is funded by a combination of private and public sources. Major sources of funding for development include the federal Airport and Airway Trust Fund (AATF) that provides financing for the AIP, passenger facility charges (PFCs), state airport grant programs, 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 secondary role played by Federal AIP and PFCs.

The amount and type of funding vary with respect to the airport's size and activity. Unlike commercial service airports, GA airports do not have access to PFCs and have limited ability to obtain debt financing. Therefore, AIP grants and, to a lesser degree, state grants are the major financing source for GA airport development. However, with AIP funds insufficient to cover all eligible projects, GA airports' potential shortfall represents approximately 27 percent of planned development costs by 2006 (GAO, 2003). As most of the federal grants either fund safety-related projects or preserve the existing infrastructure, GA airports have to seek for other financing options for landside renovation and other low-priority projects.

While large airports receive between 3 and 11 percent of their budget from the federal grants, federal funding accounts for about 28 percent of the budget of smaller airports (FAA, 2004). The figures for revenues and expenses of GA airports provided in the FAA National Plan of Integrated Airport System Reports to Congress in 1999 (FAA, 1999) and 2002 (FAA, 2002) suggest that, on average, GA airports were able to break even in 1992 (average revenues were equal to average expenses of \$200,000), whereas in 1999 an average GA airport was losing about \$100,000 per year.<sup>1</sup>

## DATA

To investigate financial performance of publicly owned and operated GA airports we conducted qualitative and quantitative analyses. In the first stage of the research we interviewed 47 GA airport managers and moderated a round table discussion at the 2005 American Association of Airport Executives (AAAE) Annual Airport Finance and Administration conference. Specific interview and round table discussion research questions included: What is the state of the airport's current financial situation? Is the concept of financial self-sufficiency important to the airport's governing body? Financial self-sufficiency was defined as the ability of an airport to generate adequate revenue to cover all normal expenses for its operation, administration, and maintenance, and, in addition, to supply the local share of federal and/or state funded capital improvement projects.

Analyzing the results of the interviews and discussion we found common themes among those GA airports which had strong, positive cash flows, and no locally subsidized development. In such cases, the airport managers were able to focus on developing real estate for non-aviation related uses, establishing industrial zones and conducting other non-traditional and non-aviation activities in addition to traditional aviation-related revenue streams such as aircraft storage and fueling.

The second phase of our study focused on identifying the relationships of the physical characteristics (e.g., runway length) of the GA airport and the attitudes of the airport manager regarding certain aspects of the financial operation of the airport that can be attributed to the financial success of the airport.

Based on the interviews and discussion, a nationwide survey of 2,288 GA airport managers was conducted. These airports represent the entire population of publicly owned and operated GA airports in the 48 contiguous continental United States that are open for public and included in the FAA database.<sup>2</sup> After the data collection period was completed, the validity of each instrument was checked to ensure that the respondents were responsive and unambiguous in answering the questions. Of 590 returned surveys, 588 (25.7 percent of 2,288) satisfied the most stringent quality control guidelines and were included in the analysis. 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 analyze the answers in a quantitative manner. A score below 4 is considered negative. Similarly, a score above 4 can be perceived as positive. The survey instrument is presented in Appendix A. The data collected have limitations that reflect the typical limitations of the survey research including the facts that the instrument only measured the instantaneous reaction of the respondents and the honesty of the responses were assumed.

### STATISTICAL ANALYSIS

The main research question of the study is whether the airport characteristics or airport manager qualities and entrepreneurial spirit drive the financial performance of GA airports. The airport characteristics, such as runway length, number of based aircraft, number of aircraft operations per year, published instrument approaches,<sup>3</sup> airport location and county population are assumed to be out of the airport managers' control. Airport manager qualities and perceived importance for GA airports to be self-sustaining are used as proxies for an airport manager entrepreneurial spirit. Several regression analyses discussed below were utilized to assess the significance of different variables in explaining financial performance of GA airports.

Forward logistic regressions were conducted to determine which independent variables were predictors of status of a GA airport as non-subsidized. The first regression presented in Equation 1 includes airport characteristics as independent variables. Data screening, evaluation of linearity and normality led to the conclusion that all observations are valid and no transformation is needed to satisfy standard regression assumptions.

$$NSUB_i = a + b_1RW_i + \sum_{j=2}^4 b_jBASED_{j,i} + \sum_{j=5}^7 b_jOPS_{j-3,i} + b_8INS\_APP_i + b_9POPUL + b_{10}SOUTH_i + b_{11}NEW\_ENG_i + e_i \quad (1)$$

Where:

*NSUB* is 1 for a non-subsidized airport and 0 otherwise;  
*RW* is 1 for airports with runway of 4,000 feet and longer and 0 for airports with shorter than 4,000 ft runway;  
*BASED* is a dummy variable that denotes based aircraft,



*BASED*<sub>2</sub> equals 1 for Quartile 2 (15 – 30 aircraft) and 0 otherwise, *BASED*<sub>3</sub> equals 1 for Quartile 3 (30 – 60 aircraft) and 0 otherwise, and *BASED*<sub>4</sub> equals 1 for Quartile 4 (>60 aircraft) 0 otherwise;

*OPS* is a dummy variable that denotes a number of annual operation, *OPS*<sub>2</sub>, *OPS*<sub>3</sub>, and *OPS*<sub>4</sub> become 1 for respective Quartiles;

*INS\_APP* is a dummy variable that becomes 1 for an airport with an instrument approach and 0 for an airport without instrument approach;

*POPUL* is the population of a county where the airport is located;<sup>4</sup>

*SOUTH* is 1 for GA airports from Southern and Southwest FAA regions and 0 otherwise; and

*NEW\_ENG* is 1 for an airport from New England FAA regions and 0 otherwise.

The rationale for including Southern and New England region variables in the model is that these regions are different from the rest of the country in terms of weather and, consequently, GA activity that may influence financial situation of the airports located in those regions.

The analysis results in two variables – Quartile 4 of based aircraft *BASED*<sub>4</sub> (more than 60 based aircraft) and Quartile 2 of estimated annual operations *OPS*<sub>2</sub> (7,000-14,000 operations per year) being statistically significant. While the coefficient of *BASED*<sub>4</sub> has an expected positive sign, the coefficient of *OPS*<sub>2</sub> is negative suggesting that GA airports from this category have less probability to be non-subsidized than airports with less than 7,000 operations per year. Low reliability of the operations' data for GA airports without control towers could be a plausible explanation of the unexpected result. Parameter estimates for Equation 1 are presented in Table 1.

**TABLE 1**  
**Logistic Regression Analysis for Non-Subsidized GA Airports Using**  
**Airport-Specific Characteristics as Independent Variables**

	<i>Coefficient</i>	<i>Standard Error</i>	<i>Wald-statistics</i>	<i>Significance</i>
<i>Constant</i>	-0.848	0.517	2.688	0.101
<i>RW</i>	-0.363	0.278	1.702	0.192
<i>BASED</i> <sub>2</sub>	0.345	0.417	0.683	0.409

TABLE 1 (Continued)

	Coefficient	Standard Error	Wald-statistics	Significance
<i>BASED3</i>	0.553	0.433	1.631	0.202
<i>BASED4</i>	0.923**	0.467	3.900	0.048
<i>OPS2</i>	-0.919**	0.425	4.674	0.031
<i>OPS3</i>	-0.425	0.364	1.359	0.244
<i>OPS4</i>	0.343	0.377	0.825	0.364
<i>INS_APP</i>	-0.224	0.275	0.666	0.414
<i>POPUL</i>	0.000	0.000	0.086	0.770
<i>SOUTH</i>	0.069	0.224	0.095	0.758
<i>NEW_ENG</i>	0.268	0.531	0.256	0.613

Note: Statistical significance at the 5% level is indicated by \*\*.

Equation 2 presents the logistic regression model that includes the perception and importance variables as predictors for an airport to be non-subsidized.

$$NSUB_i = a + b_1IMPSS_i + b_2COMVIEW_i + b_3FAAF_i + b_4STATEF_i + b_5FUEL_i + b_6GRLEASE_i + b_7HANGAR_i + b_8OTHER_i + e_i \quad (2)$$

Where:

*NSUB* is 1 for a non-subsidized airport and 0 otherwise;

*IMPSS* is the airport manager's perceived importance to be self-sustaining (on a scale from 1 to 7);

*COMVIEW* is the community's view of an airport (asset or liability on scale from 1 to 7);

*FAAF* indicates airport manager's perception if the FAA provides the airport with enough funding (on scale from 1 to 7);

*STATEF* indicates airport manager's perception if the state provides the airport with enough funding (on scales from 1 to 7);

*FUEL*, *GRLEASE*, *HANGAR*, *OTHER* are importance of revenue sources for an airport (fuel sales, ground leases, hangar leases, and others using scales from 1 to 7).

Logistic regression with perception and importance variables that characterize a GA airport manager and community produces more interesting results than the analysis with the airport characteristics as predictors. GA airport managers' perceived importance to be self-sustaining is statistically significant for the likelihood of a GA airport to be self-sustaining. This result means that airport manager beliefs

are more important to the financial conditions of the airport than airport specific characteristics, such as runway length, instrument approach, location and other factors. Also, the coefficient of *FAAF* is positive and marginally significant (at the 10 percent level), and coefficient of *STATEF* is negative and statistically significant, suggesting that GA airports with managers, who believe that FAA provide them with enough funds and state is not, have more chance to be self-sustaining. Parameter estimates are presented in Table 2.

**TABLE 2**  
**Logistic Regression Analysis for Non-Subsidized GA Airports Using Perception and Importance Variables as Independent Variables**

	<i>Coefficient</i>	<i>Standard Error</i>	<i>Wald-statistics</i>	<i>Significance</i>
<i>Constant</i>	-2.069***	1.256	2.714	0.099
<i>IMPSS</i>	0.283**	0.144	3.880	0.049
<i>COMVIEW</i>	-0.145	0.143	1.022	0.312
<i>FAAF</i>	0.308*	0.165	3.475	0.062
<i>STATEF</i>	-0.295**	0.141	4.341	0.037
<i>FUEL</i>	0.107	0.143	0.557	0.456
<i>GRLEASE</i>	0.082	0.126	0.427	0.513
<i>HANGARS</i>	-0.133	0.150	0.786	0.375
<i>OTHER</i>	-0.010	0.118	0.007	0.932

Note: Statistical significance at the 10%, 5% and 1% level is indicated by \*, \*\*, or \*\*\*, respectively.

One can argue that the manager's perceived importance for a GA airport to be self-sustaining (*IMPSS*) can be an endogenous variable. To make sure that the logistic regression presented in Equation 2 produces reliable estimates, we test it for endogeneity. If *IMPSS* is uncorrelated with the error term in Equation 2, regression analysis is more efficient than the 2SLS estimator that typically used in presence of endogeneity. We use three additional variables that characterize an airport manager and do not appear in Equation 2: *BUS\_TIME* is the number of years a GA airport manager has been in the business of managing airports; *EDUC* is the level of education of a manager, and *BUS\_DEG* is whether the manager has an undergraduate or graduate degree in business or a related discipline. Assuming that all three

additional variables are exogenous, we estimate the reduced form for *IMPSS* as presented in Equation 3.

$$\begin{aligned} IMPSS_i = & c + d_1 COMVIEW_i + d_2 FAAF_i + d_3 STATEF_i + d_4 FUEL_i \\ & + d_5 GRLEASE_i + d_6 HANGAR_i + d_7 OTHER_i \\ & + d_8 BUS\_TIME + \sum_{j=9}^{11} d_j EDUC_{j,i} + d_{12} BUS\_DEG_i + \varepsilon_i \end{aligned} \quad (3)$$

Where:

*EDUC* denotes the level of education of a manager (*EDUC*<sub>2</sub> equals 1 for GA airport managers with associate degrees and 0 otherwise, *EDUC*<sub>3</sub> equals 1 for managers with undergraduate college degrees and 0 otherwise, and *EDUC*<sub>4</sub> equals 1 for managers with graduate degree and 0 otherwise); and

*BUS\_DEG* is 1 for managers with undergraduate or graduate degree in business or related discipline (e.g., management) and 0 otherwise; all of the other variables are described earlier.

Since all of the independent variables in Equation 3 are exogenous and are uncorrelated with the error term  $e_i$  of Equation 2, *IMPSS* is uncorrelated with  $e_i$  only if the error term  $\varepsilon_i$  of Equation 3 is uncorrelated with  $e_i$ . To test for it, we estimate Equation 4:

$$\begin{aligned} NSUB_i = & a + b_1 IMPSS_i + b_2 COMVIEW_i + b_3 FAAF_i \\ & + b_4 STATEF_i + b_5 FUEL_i + b_6 GRLEASE_i \\ & + b_7 HANGAR_i + b_8 OTHER_i + \delta \hat{\varepsilon}_i + e_i \end{aligned} \quad (4)$$

where:  $\hat{\varepsilon}_i$  is the reduced form residuals from Equation 3 and all of the other variables are described earlier.

Using T-statistics, we cannot reject the null hypothesis that  $\delta = 0$ , and therefore conclude that *IMPSS* is exogenous, since  $\hat{\varepsilon}_i$  and  $e_i$  are not correlated. Parameter estimates of Equations 3 and 4 are not presented here for brevity.

Since the GA airport manager perceived importance to be self-sustaining is highly significant in defining a GA airport as self-sustaining (non-subsidized), we conduct another multiple regression analysis that uses manager-specific characteristics as independent

variables. The motivation of this regression is to identify manager-specific characteristics that may influence his or her perception about the need of a GA airport to be self-sustaining. The model is presented in Equation 5.

$$\begin{aligned}
 IMPSS_i = & a + b_1BUS\_TIME_i + \sum_{j=2}^4 b_j EDUC_{j,i} \\
 & + b_3BUS\_DEG_i + e_i
 \end{aligned}
 \tag{5}$$

Where all of the variables are explained earlier.

Parameter estimates are presented in Table 3. Only the coefficient of *BUS\_DEG* is positive and marginally statistically significant (at the 10 percent level), indicating that managers with a degree in Business or related discipline may assign higher importance to airports being self-sustaining, and consequently, increase the likelihood of their airports of being self-sustaining. Managers' level of education and their tenure in airport management business turn out to be insignificant suggesting that these variables are not important in explaining managerial beliefs about self-sustainability.

**TABLE 3**  
**Regression Analysis for Importance to Be Self-Sustaining Using**  
**Manager-Specific Characteristics as Independent Variables**

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

Note: Statistical significance at the 10% and 1% level is indicated by \*, and \*\*\*, respectively.

### FINDINGS AND IMPLICATIONS

GA airports compete regionally among each other for a limited market share of aviation activity. The airport manager who understands the business of aviation and more importantly, how to

market the airport's resources and is allowed the freedom to make sound entrepreneurial decisions will succeed over those who do not and/or cannot. Our research supports the assertion that the incremental increase in revenues from the development of what have traditionally been non-aviation-related businesses at GA airports is becoming a very important resource for success in achieving self-sufficiency.

It is therefore the responsibility of the GA airport manager to exercise the initiative to seek other avenues to improve the financial performance of the airport. This requires aggressively looking for opportunities to attract additional business, using the airport's real estate and other facilities as an asset. Such a course of action is not without risk and expense, but both the direct payoff (additional revenue to the airport) and perhaps more importantly, the increase in jobs created and services purchased locally, along with incidental tax revenues and other indirect benefits to the local economy can offset all costs.

Those managers who have succeeded in attracting additional revenue sources and enjoy financially self-sustaining airports appear to have understood and embraced the entrepreneurial spirit. The research indicates the GA airport manager's attitudes and desire to operate their airport as a business are among the most important components for achieving self-sufficiency. The development of educational programs 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 meaningful for helping many airport managers acquire a better understanding of the importance of the issues.

The GA airport manager needs the support and assistance from federal, state and their local governments in order to be successful in achieving financial self-sufficiency. At the same time, the position of airport manager appears to be evolving from one requiring an aviation-oriented background and experience towards having more business management and real estate development skills—in essence, the spirit of the entrepreneur with the ability to successfully operate within the most unlikely of places, a public entity.

### CONCLUSION

A number of interdisciplinary studies discuss the benefits of entrepreneurship in the public sector. However, as suggested by Moon (1999), there is still a need in empirical studies about the entrepreneurship in the public sector. In this paper, we attempt to decrease the deficit of such studies by empirically investigating the relation between the entrepreneurial beliefs of general aviation airport managers and their airport financial performance. Using logistic regression analyses, we conclude that the airport managers' attitudes, specifically their perceived importance for a GA airport to be self-sustaining, significantly improve the likelihood of their airport to operate without subsidies. In addition, airport managers with business or related degrees seem to be more inclined to believe in self-sustainability. Surprisingly, the airport specific characteristics including county population, favorable location, runway length, and others found to be statistically insignificant in predicting the self-sustainability of a GA airport. In general, our findings support the arguments of theoretical literature about the benefits of promoting entrepreneurship in public sector organizations.

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### NOTES

1. FAA NPIAS 2004 and 2006 Reports to Congress do not provide data for revenues and expenses of GA airports.
2. General aviation airports located in Alaska and Hawaii were excluded from the survey due to the fact that the states' Departments of Transportation own and operate the majority of GA airports in these states and determine funding priorities and the economic development needs along with the allocation of financial resources. Also, distinctive characteristics of general aviation activity in Alaska and Hawaii are somewhat unique and could possibly have skewed the data and confounded the results of the study.

3. A GA airport with published instrument approach procedures is more attractive for transient traffic, especially in adverse weather conditions than an airport without published instrument approaches.
4. County populations are 2003 estimates published by the U.S. Census Bureau available at <http://quickfacts.census.gov>.

#### REFERENCES

- Bellone, C.J., & Goerl, G.F. (1992). "Reconciling Public Entrepreneurship and Democracy." *Public Administration Review*, 52 (2): 130-134.
- Doig, J.W., & Hargrove, E.C. (1987). *Leadership and Innovation: Entrepreneurs in Government*. Baltimore, MD: Johns Hopkins University Press.
- Federal Aviation Administration (FAA), U.S. Department of Transportation (1999, March), *National Plan of Integrated Airport System (NPIAS) (1998-2002)* (Report to Congress). Washington, DC: Author.
- Federal Aviation Administration (FAA), U.S. Department of Transportation (2002, August). *National Plan of Integrated Airport System (NPIAS) (2001-2005)* (Report to Congress). Washington, DC: Author.
- Federal Aviation Administration (FAA), U.S. Department of Transportation (2004, September). *National Plan of Integrated Airport System (NPIAS) (2005-2009)* (Report to Congress). Washington, DC: Author.
- Federal Aviation Administration (FAA), U.S. Department of Transportation (2006, October). *National Plan of Integrated Airport System (NPIAS) (2007-2011)* (Report to Congress). Washington, DC: Author.
- Guzman-Cuevas, J. (1994). "Towards a Taxonomy of Entrepreneurial Theories." *International Small Business Journal*, 12 (4): 77-88.
- Lynch, T. D., & Lynch, C. E. (1997). "The Road to Entrepreneurial Budgeting." *Journal of Public Budgeting, Accounting, & Financial Management*, 9 (1): 161-180.



- Moody's Public Finance (1994, April). "The Implications of Reinventing Government." *Perspectives on Municipal Issues*: 1-7.
- Moon M. J. (1999). "The Pursuit of Managerial Entrepreneurship: Does Organization Matter?" *Public Administration Review*, 59 (1): 31-43.
- Morris, M. H., & Jones, F. F. (1999). "Entrepreneurship in Established Organizations: The Case of the Public Sector." *Entrepreneurship: Theory and Practice*, 24 (1): 71-91.
- Osborne, D., & Gaebler, T.A. (1992). *Reinventing Government: How the Entrepreneurial Spirit Is Transforming the Public Sector*. Reading, MA: Addison-Wesley.
- Osborne, D. (1993). "Reinventing Government." *Leadership Abstracts*, 6 (1): 3-8.
- Rainey H.G., & Steinbauer, P. (1999). "Galloping Elephants: Developing Elements of a Theory of Effective Government Organizations." *Journal of Public Administration Research and Theory*, 9 (1): 1-32.
- Santos F.J., & Alcalde, F.L. (2002). "Towards an Empirical Methodology for the Measurement of the Quality Entrepreneur: The Case of Sevillian Entrepreneurs." A paper presented at the 42<sup>nd</sup> European Regional Science Association Conference, August 27-31, Dortmund, Germany.
- U.S. General Accounting Office (GAO), 2003. *Airport Finance: Past Funding Levels May Not Be Sufficient to Cover Airports' Planned Capital Development* (Testimony before the Subcommittee on Aviation Senate Committee on Commerce, Science, and Transportation). February 2003. Washington, DC: Author.
- Wart, M.V. (1995). "The First Step in the Reinvention Process: Assessment." *Public Administration Review*, 55 (5): 429-438.
- Zietlow, J.T. (2001). "Social Entrepreneurship: Managerial, Finance and Marketing Aspects." *Journal of Nonprofit and Public Sector Marketing*, 9 (1): 19.

## APPENDIX A Survey Instrument

This survey is being conducted by Embry-Riddle Aeronautical University 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 Dr. Vitaly S. Guzhva (386) 226-7946 (vitaly.guzhva@erau.edu) or Dr. Dave Byers (386) 226-6700 (david.byers@erau.edu).

**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
	1	2	3	4	5	6	7	
<b><i>FUEL SALES</i></b>								<i>N/A</i>
<b><i>GROUND LEASES</i></b>								<i>N/A</i>
<b><i>LANDING FEES</i></b>								<i>N/A</i>
<b><i>HANGAR LEASES</i></b>								<i>N/A</i>
<b><i>OTHER</i></b>								<i>N/A</i>
<i>(Please, specify below)</i>								

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")

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

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*Thank you very much for participating!*