North Dakota Airport and FBO Impact Study

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rural aviation research

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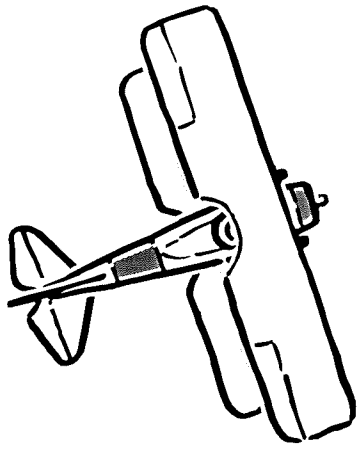
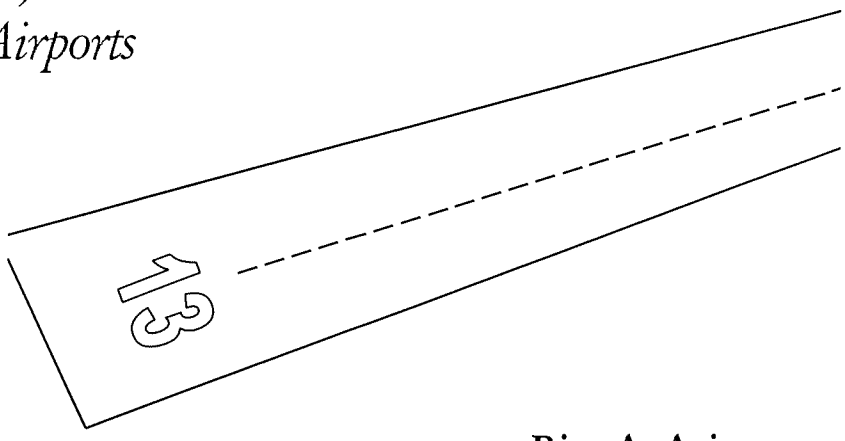
Aviation is a vital economic component of North Dakota's Transportation System. This study determines the impact of Fixed-Base Operators (FBOs) on North Dakota Communities and Airports





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Sponsored by: *North Dakota Aeronautics Commission*

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Abstract

"Today's increasingly global and high-tech economy is placing new demands on transportation systems in rural America. These demands call for more efficient intermodal systems, with the rural airport serving as a key transportation link for many rural businesses. Airport improvements, rather than new airports, may be required if rural communities are to make the most of their economic potential." (Reeder and Wanek 1995).

Aviation is part of the North Dakota's economic infrastructure providing passenger air service, air freight, air ambulance, agricultural services, and jobs to the local economy. Businesses that consider locating in the state often evaluate transportation, including scheduled air service, air-freight, aircraft lease, hangar rental, air taxi service, aircraft fuel, and maintenance. Aviation services at most airports are provided by Fixed-base Operators (FBO).

Like any other industry, FBOs and airport operators are faced with competition, a changing global economy, increased regulations, and the need to renovate the way business is conducted to meet the ever growing demands of their clients. Building an airport, extending a runway, or improving services, offers no guarantees that customers would seek to spend their money at the local airport or the community will support the airport. Promoting the airport as an asset to people in the community and especially those in government, takes on an urgency if an airport is to survive. Promoting the airport cannot be a one-time effort, but an on-going process that takes time and commitment to win support. Users and providers of aviation services must to be involved in the continuous and positive promotion of the airport (Minnesota Flyer Magazine 1996).

Aviation experts predict the number of FBOs in the United States will continue to decline from an estimated 10,000 in the 1980s to approximately 4,000 in the 1990s to less than 2,000 by the turn of the century. FBO's return on investment is among the lowest when compared to service, manufacturing, and other transportation industries. In today's ever-changing market, FBOs may have to adapt to the new "global era" of doing business. As another aviation expert explained it, "FBO's have three choices, one, grow through acquisition and

internally; two, downsize into a niche that can be dominated; or three, stand still and be rolled over" (Searles 1993).

While some FBO choose to get out of business, others are fighting back. The exceptions are building partnerships with their community, participating in local politics, providing services their customers may not find elsewhere, closely monitoring daily operations, and seeking opportunities for positive media attention. These and other efforts return profits that may help FBOs stay in business.

Acknowledgments

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Finally, thanks to the staff of the Upper Great Plains Transportation Institute for reviewing and offering their comments on this report.

Table of Contents

List of Figures

List of Tables

Chapter 1

Introduction

"General aviation helps provide social and economic benefits to Americans. Besides providing consumer and business travel opportunities, airports serve as a vital link to health services, law enforcement, disaster assistance, and are an economical focal point for our communities" (Minnesota Flyer Magazine 1995).

General aviation (GA) is at the heart of air transportation system in the United States. More than 500,000 people are employed in the industry. It is estimated that for every person employed in the GA industry, the equivalent of three additional jobs is created (Dan McDowell 1995). Economic impact from GA activity is estimated to be more than $45 billion annually and includes direct, indirect, and induced impacts. Direct impacts are financial transactions that occur as a result of services provided by the air passenger and air cargo industries. They typically occur at airports and aircraft manufacturing firms and include expenditures by airlines, airport tenants, air cargo, FBOs, ground transport firms, flight training schools, airport concessions, and aircraft manufacturing. Indirect impacts are financial transactions that occur due to the use of aviation services and include expenditures by travel agents. They typically occur off airport. Induced impacts are multiplier implications associated with direct and indirect impacts (Wilbur Smith Associates 1993).

There are 17,600 aircraft landing facilities in the United States. Air carriers serve 388 of the facilities while GA serves them all, making airports-the hubs of GA activity-valuable to communities large and small. Airports provide more than air transportation to people and commerce. They also help attract new industries, which in turn provide much needed employment opportunities in rural America. Airports provide rapid access to medical facilities, aid in law enforcement, search and rescue, and provide a window for people interested in learning to fly aircraft. North Dakota has 96 public-access airports and 39 have

FBOs (Figure 1.1). Public-access airports in North Dakota maintain more than 1,400 aircraft and report annual operations in excess of 900,000. These operations include the flight training program offered at the University of North Dakota in Grand Forks, schedule air service provided by regional and national carriers in the state, and other general aviation traffic. There are more than 300 private aircraft landing areas in the state as well.

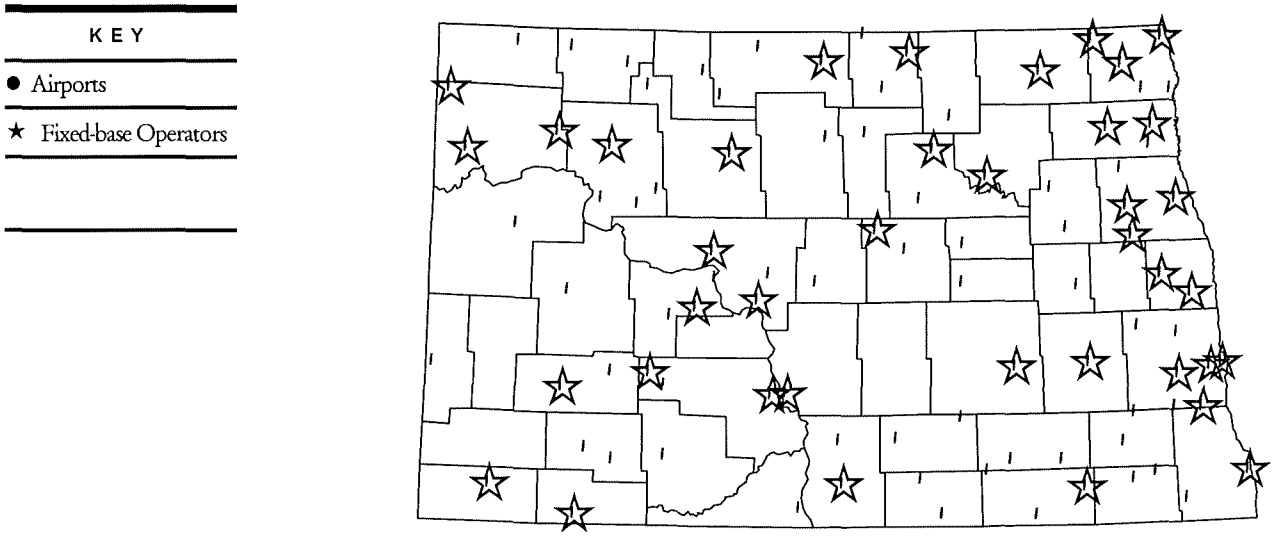


Figure 1.1 *North Dakota's public-access airports and fixed-base operators*

Fixed-base operators provide many of the services at GA airports and at many airports, the FBO also is responsible for the airport's daily operation. Today, many FBOs are struggling to maintain profitability. Regulations, higher liability costs, low return on investment, fewer people learning to fly, and increasing cost of aircraft fuel are just some of the reasons that FBOs are closing their operations. The number of FBOs in the United States has been declining since the mid 1970s when there were nearly 10,000. By the year 2000, less than 2,000 are expected to remain. Over the past 27 years, 16 public-access airports in North Dakota have closed operations. Over the past 20 years, there has been a decline in services offered at FBOs in North Dakota, such as air charter, flight instruction, and hangar rentals.

Today the economies of nations are linked, forcing changes in the assumptions under which airports in rural America were built and operate. Communities can no longer assume that just because the airport exists, customers will come. Airport and FBOs have to compete to maintain a customer base and work harder to attract new customers. The economic impact of gaining or loosing an

FBO can be far reaching. An FBO going out of business may serve notice that the airport is soon to follow. A town without an airport is at a disadvantage when competing to market the community as a place to conduct business. Businesses often consider the availability of air transportation when making decisions about expansion and relocation. In a study of export-oriented firms in North Dakota, South Dakota, and Nebraska, researchers surveyed new businesses and businesses considering relocating or expanding to determine the importance of transportation in selecting a location for businesses. Researchers found that more than half new and relocating firms valued motor freight, 36 percent valued access to interstate highway, 21 percent valued scheduled air service, and 10 percent valued rail service. Among firms considering expanding, 47 percent valued motor freight service, 32 percent valued access to interstate highway, 22 percent valued scheduled air service, and 12 percent valued rail service (Leistritz and Ekstrom 1990).

About 35 percent of North Dakota towns are located within 20 miles of an airport that provides scheduled air service and approximately 80 percent are located within 50 miles of an airport that provides similar services (Figure 1.2).

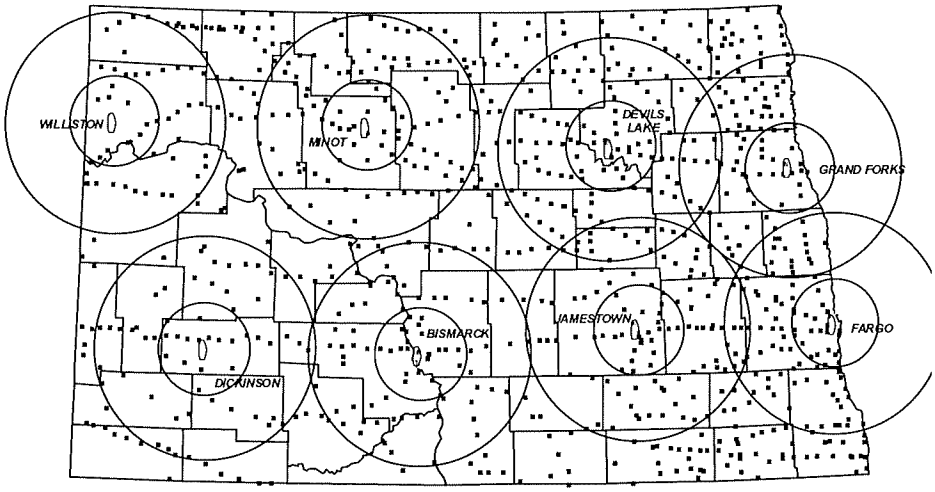


Figure 1.2 *North Dakota towns within 20 (smaller circle) and 50 miles (larger circle) from scheduled air service airports*

The distance between airports and towns can be an important factor for firms who depend on timely access to air travel and air cargo and the availability of choices when traveling to commercial and financial centers in and outside and United States. However, only eight of the 96 airports in North Dakota are designated as Scheduled Air Service airports. Most airports in rural areas do not have full-time managers. Airports in North Dakota with full-time managers

include: Bismarck, Dickinson, Devils Lake, Fargo, Grand Forks, Jamestown, Minot, Williston and Mandan. Owners of aerial application businesses oversee 32 of the remaining 88 rural airports. Volunteer members from airport authorities manage rest of the airports in the state. Most airport managers also are non-paid staff and some airports have no designated staff. Airports generally are over-seen by an airport authority, which consists of a board of mostly non-paid members. North Dakota's Century Code stipulates that airport authority members should be volunteers; however, the management of the airport may be contracted out to the general public. Some members of the airport authority may be leaders in their communities and others are interested citizens. Board members may not have a background in aviation and may rely on the expertise of the local aviation public to offer guidance and support. Many of these airports rely on local mill-levy or other government funding to partially financial their operations. In North Dakota, 77 percent of airports rely on state government for a portion of their annual operating funds (Aziz and Benson 1996). Rural airports have neither the staff nor the financial means to hire personnel to help market their facilities. They are entirely dependent on the aviation pubic to pass the word about their facility. The backing of the community and the support of the aviation public are critical to the survival of small airports.

Meeting the future needs of aviation in North Dakota, requires identifying issues critical to airports and FBOs in the state. To that effort, a study was commissioned by the North Dakota Aeronautics Commission in cooperation with the Federal Aviation Administration, and managed by the Upper Great Plains Transportation Institute. The study would help identify causes for the declining number of FBOs in the state and develop a base for rural airport policies that will help forecast aviation business activities at public-access airports.

Project Objectives

The objectives and benefits of the project are:

- Determine the impact of the state's economic development on rural airports and FBOs by surveying economic development agencies (EDA) in North Dakota. The survey would solicit responses from EDAs on the role of aviation in economic development programs and degree to which aviation is a priority for EDAs. Survey data could assist airports and FBOs planned efforts to enhance operations and marketing of facilities while helping to determine cost effective improvement.

- Determine the impact of regulations on airports and FBOs and identify impacts, which add costs to operators. This information would help

FBOs formulate airport planning and project development to meet public demands.

- Identify the cause of decline in aviation-related business at airports and determine future trends in business closures. Analysis of adverse impacts to the state's aviation businesses would help develop trends and serve as a source of information for airport policy makers.

- Identify the economic loss to airports and cities resulting from the closure of FBOs. Data would assist communities that are planning to institute development programs to determine potential returns from efforts invested to bring new businesses in their communities.

- Determine the economic impact to airports in North Dakota from airfreight, agricultural-related aviation services, and air ambulance services. Policy makers can use the information to develop long-range goals that address issues important to the above sectors.

- Publish the findings of the study. Information can be used to set goals, communicate findings with state and local government, economic development agencies, airport and FBO operators, and help develop programs to address issues critical to North Dakota's aviation community.

Background

There are approximately 400 towns in North Dakota (Figure 1.3). Among these, eight are considered major cities, including Fargo, Grand Forks, Devils Lake, Jamestown, Minot, Bismarck, Williston, and Dickinson. These cities have extensive transportation, financial, agricultural, and retail sectors and are major centers of employment. The cities also have airports, which offer scheduled air service. However, much of the state's 70,655 square miles of land are devoted to farming and ranching. Of the state's 53 counties, 38 generate 20 percent of total earnings from farming, eight counties generate 10 to 19 percent of total earnings from farming, and the remaining seven counties generate up to 10 percent of total earnings from farming. As a result of slumps in agriculture, mining, and other resource-dependent activities, the state's farming industry experienced significant changes during the 1980s. Recent analysis indicates that traditional industries such as agriculture, forestry, mining, and manufacturing - previously the mainstays of rural economy - may not be major sources of future employment growth. If rural mainstay industries are to be competitive in an increasing international economy, these industries will experience the pressures to become more efficient, which may lead to less employment. Rural areas seeking

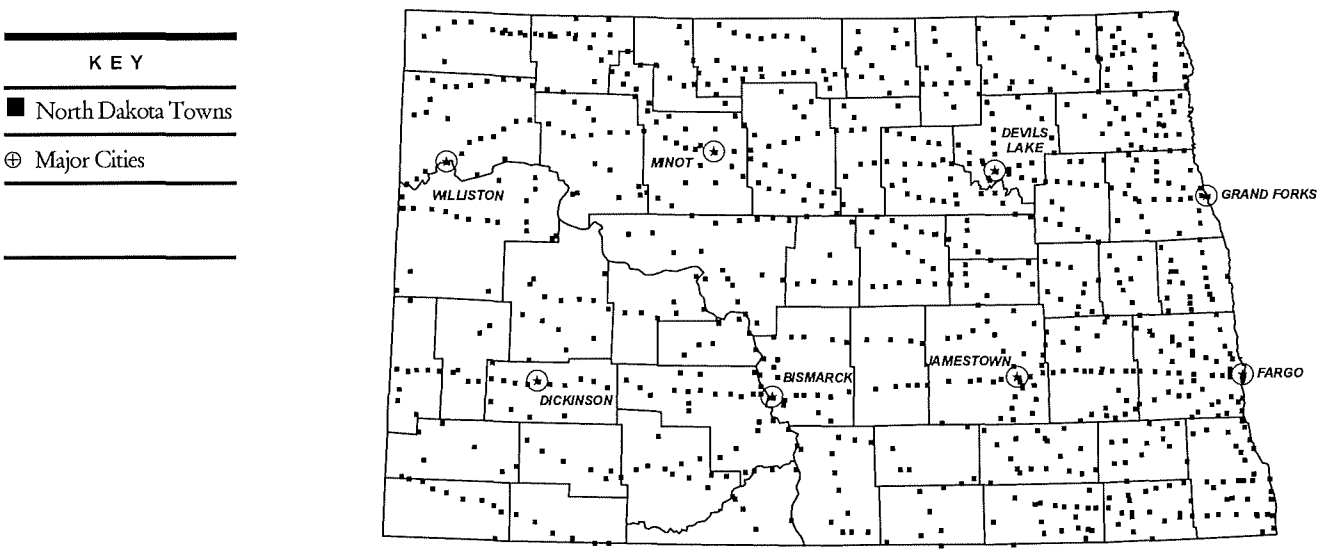


Figure 1.3 *North Dakota towns and major cities*

economic growth may have to consider a wider range of export-oriented activities outside of manufacturing industries (Leistritz and Ekstrom 1990).

Aviation plays an important role in North Dakota's agricultural economy. In 1993, more than 4 million acres of farmland were serviced by aerial application (North Dakota Aeronautics Commission 1994). The aerial application industry recorded over 100,000 operations and employed a workforce of nearly 700 in 1993. Total economic impact from aviation-related activities including primary and secondary activity, were estimated to create 8,700 jobs and over $585 million in expenditures in 1994 (North Dakota Aeronautics Commission 1994). Aviation also is important to the manufacturing industries, especially to the sectors that use "just in time" programs. Industries relying on these programs place a premium on service reliability and nighttime air cargo operations to deliver material and supplies to their factories as needed, instead of maintaining large inventories, which add to the cost of production (Reeder and Wanek 1995). Nationally, almost 40 percent of manufacturing firms are using "just in time" programs and another 20 percent are expected to switch to similar inventory management programs. This would open economic opportunities for airports in rural areas. However, rural airports might need to upgrade facilities to provide for all-weather, nighttime take-off and lands of aircraft to serve such operations (Reeder and Wanek 1995).

Basis of the Problem

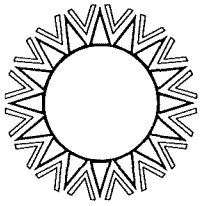
Decline number of aviation businesses and the potential of more airport closures are a concern to government and city leaders in North Dakota. The state has lost one public-access airport per year since 1990. Loss of aviation businesses has the potential to impact the state's overall economy. The closure of aviation businesses such as FBOs also raises questions. Are FBO closures economically related to the inability of FBOs to remain profitable, did financially weaker FBOs merge with stronger ones, or did FBOs relocate to more suitable markets outside North Dakota?

Local governments also are concerned about the potential loss of their airport and FBO and the economic impact the loss may have on their communities. Several studies have been conducted on the impacts of closing large airports; few studies have focused on the impacts of closing small airports in rural areas. Communities that are considering investing efforts to attract new aviation businesses have few resources of predicting the potential return on their investment. Airports in rural areas do not employ a large workforce. The benefits of an airport may not be jobs created directly by the airport, but jobs created by firms attracted to a community in part because of the airport. Measuring the economic impact of different aviation business would help communities determine the cost of losing an airport or an FBO and the benefits of working toward gaining a new business. The study findings attempts to answer questions raised about the economic viability of aviation-related businesses in North Dakota.

Chapter 2

Economic Development for Airports and FBOs

"Improving smaller existing airports might offer the greatest benefits to rural America by furthering the growth of high-tech business development in local communities" (Reeder and Wanek 1995).



Public out-cry is demanding that America sweep away old ways of thinking and acting in the way it makes and implements public policies. A basic theme that underlies this revitalized approach is the belief that government-if properly organized and managed, can have a positive impact on the critical problems facing the nation. Rural economic development is among the problems on the nation's policy agenda. Following the lingering recession of the 1980s that highlighted deeper and more enduring changes underway in rural economy, rural development has assumed new prominence (Reid and Sears 1995).

Economic development officials in rural America emphasize the need to diversify rural economies because traditional rural industries such as farming, mining, and manufacturing are faced with increased competition from global and high-tech economy. Global economies also are placing new demands on transportation systems in rural America. High-tech industries are ranked high by rural development officials trying to attract businesses into their communities and many believe that good air transportation is essential for thriving high-tech firms (Reeder and Wanek 1995). Indeed, many firms include the availability of quality air service as an important community characteristic in their facility location decisions (Due et at. 1990).

Economic development efforts in small communities focus on activities, which help create jobs and increase the local tax base, by promoting their community to

businesses located outside the area and encouraging expansion of existing businesses. In addition, EDAs also promote educational and cultural activities by improving the school systems, developing community golf courses and swimming pools, offering incentives for home construction, and improving the appearance of the community by developing parks and recreation areas (Shaffer and Pulver 1995). Traditionally, people involved in making policies in small rural communities are volunteers. Part-time elected or appointed officials control local governments. Government and community groups may not have staff with the time or the expertise to provide guidance toward economic development policy decisions (Shaffer and Pulver 1995).

Leaders in rural North Dakota are faced with hard decisions as communities lose population, farms, and businesses. Almost 80 percent of the state's economic activities are controlled by six counties (Cass, Grand Forks, Burleigh, Ward, Stark, and William), leaving 20 percent of the activities to be divided by the remaining 47 counties. In 1993, North Dakota ranked 41st in the United States in per capita personal income (PCPI) of $17,072 compared to the national average of $20,800. The average PCPI growth rate has been 5.5 percent nationally, compared to 4.4 percent in North Dakota (Goodman 1996).

Conversely, low figures can be a selling point for economic development. The state has among the lowest crime rates in the nation. In 1990, the murder rate in the state was .80 for every 100,000 people, a far cry from the national average of 9.40 murders per 100,000 people. During the same year, North Dakota posted low murder rates compared to South Dakota, Minnesota, Iowa, and Nebraska, which posted murder rates of 2.00, 2.70, 1.90, and 2.70 for every 100,000 people, respectively (Goodman 1996). Among crimes of assault, rape, and robbery, North Dakota again posted the lowest number (Figure 2.1).

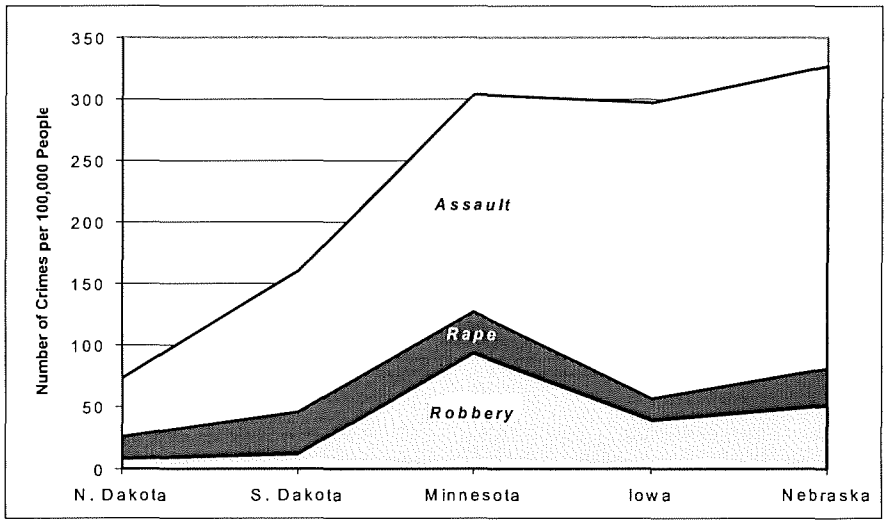


Figure 2.1 *Assault, rape, and robbery in North and South Dakota, Minnesota, Iowa, and Nebraska*

Survey of North Dakota Economic Development Agencies

More than 270 Economic Development Agencies (EDA) are located in North Dakota (Figure 2.2). Some agencies operate with a complement of full-time staff while others have either part-time or non-paid staff. EDAs are established as foundations, corporations, associations, or a part of the city administration in which it is established.

KEY

▲ Economic Development Agencies

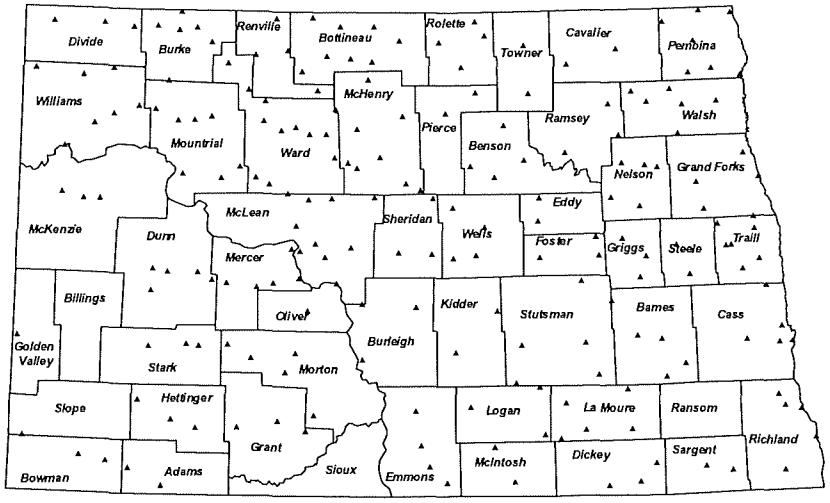


Figure 2.2 *Economic development agencies in North Dakota*

A survey was designed to elicit responses from North Dakota EDAs on the role of air transportation in community development programs (Appendix A). EDAs were asked to participate in the survey because they often assist in planning and developing economic development projects initiated by the community.

The objectives of the survey were to determine:

- the role of aviation in economic development programs developed by EDAs, and
- the degree to which aviation is valued by people and EDAs in North Dakota communities.

Out of the 270 surveys mailed to EDAs:

- 25 percent of the surveys were returned completed, and
- an average of 80 percent of the questions in each survey was completed.

Survey results indicate almost half (49 percent) of North Dakota communities with EDAs are located within one to five miles from a public-use airport but without scheduled air service. The results also show that 68 percent of communities with EDAs are located more than 40 miles from an airport with scheduled air service (Figure 2.3).

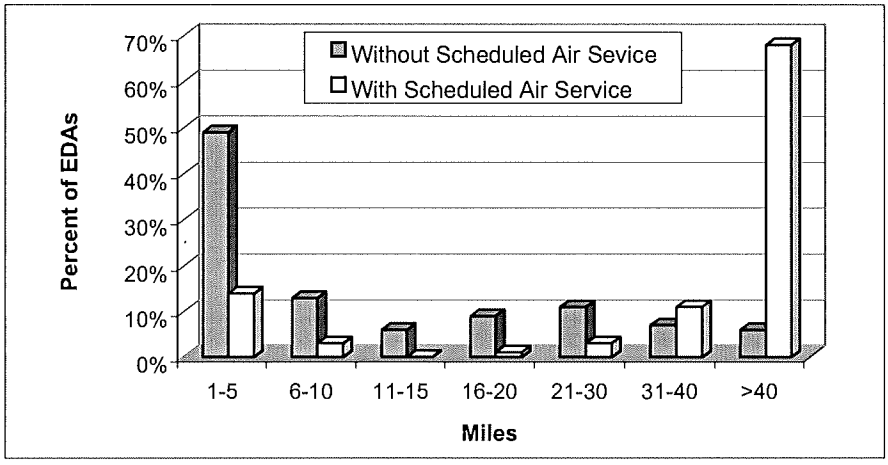


Figure 2.3 *Distance between communities with EDA and airports with and without scheduled air service.*

Airport businesses knows as Fixed-base Operators (FBOs) offer a number of aviation services. EDAs were asked to describe the types of aviation services or activities located at the local airport (Figure 2.4).

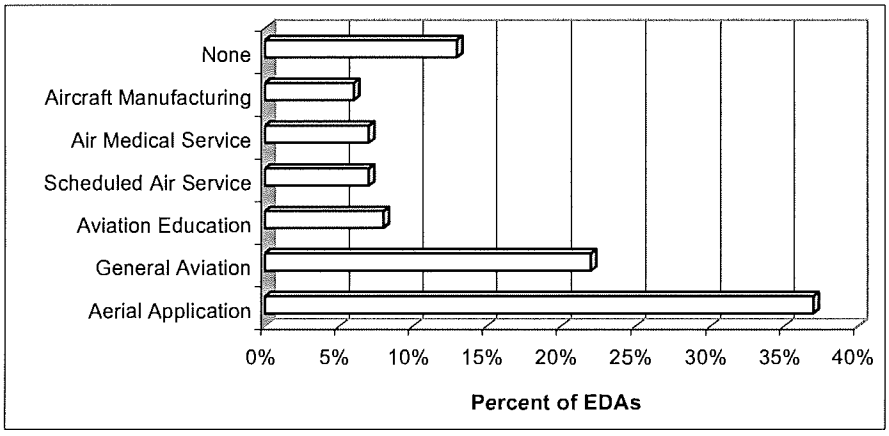


Figure 2.4 *Aviation activity that EDAs believe is located in their community*

More than one-third of EDAs (37 percent) believe the local airport offers aerial application services. Twenty-two percent believe their airport offers some type of general aviation activity. However, 13 percent believe the local airport offers no aviation-related services.

EDAs were asked if people in their community support economic development, the degree to which the people supported aviation-related economic development programs, and the degree to which aviation is a priority in EDA's programs (Table 2.1).

Category	High	Medium	Low	None
People in the community support economic development	27%	51%	19%	3%
People in the community value aviation-related activity	10%	41%	39%	10%
Degree to which aviation is a priority in EDA's programs	10%	29%	30%	31%

Table 2.1 *Degree of community support for economic development, aviation-related activity, and degree to which aviation-related activity is a priority in EDA programs*

Of the EDAs responding to the survey, 27 percent believe people in the community have a "high" degree of support for EDA programs. Ten percent believe people in their community have a "high" value for aviation-related activity and the same percent of EDAs place a "high" priority on aviation-related economic development programs. About 30 percent of EDAs give aviation-related programs either "low" and "no" priority.

Nearly half of the EDA responding to the survey (49 percent) indicated the geographic scope of their economic development programs are city based, nearly one-third (30 percent) are county based, and 12 percent are multi-city based (Figure 2.5).

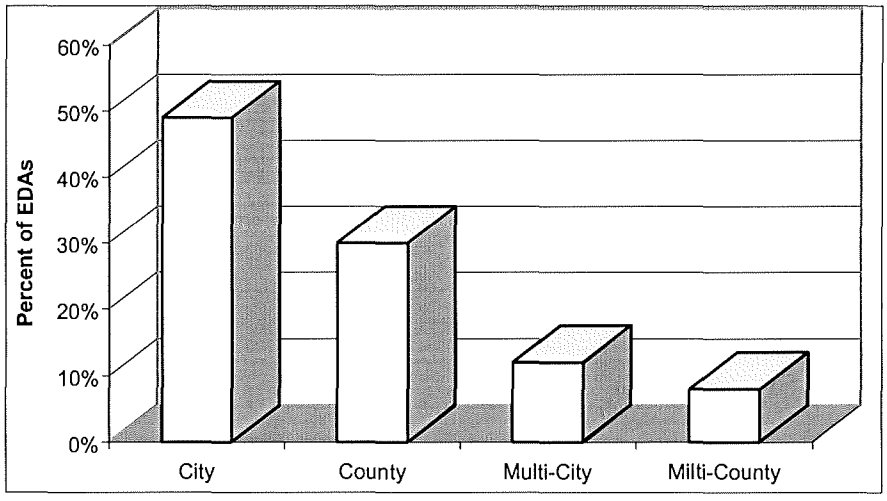
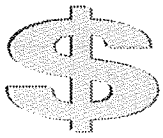


Figure 2.5 *Geographic scope of EDA programs in North Dakota*

EDA's Annual Operating Budget



Approximately one-fifth (20 percent) of EDAs reported having no budget and about the same number reported having annual budgets under $5,000. Eight percent of the EDAs reported having budgets in excess of $250,000 (Table 2.2).

Annual Operating Budget	Number of Agencies	Percent of Total
$0	14	20%
$100 - $5,000	15	21%
$5,000 - $10,000	1	1%
$10,000 - 25,000	13	19%
$25,000 - $50,000	8	11%
$50,000 - $100,000	9	13%
$100,000 - $25,000	4	6%
$250,000 - $500,000	3	4%
$ More than $500,000	3	4%

Table 2.2 *EDA's average annual operating budget over the past five years.*

Survey results suggest there is a relationship between the annual operating budget of EDAs and the degree to which EDAs place a "high" priority on aviation-related economic development programs. Among EDAs that place a "high" priority on aviation-related programs,

- 29 percent have an annual budget of $50,000 to $100,000,
- 29 percent have an annual budget of $100,000 to $250,000,
- 14 percent have an annual budget of $250,00 and $500,000, and
- 14 percent have a budget more than $500,000.

Among EDAs which place "low" priority on aviation-related programs, almost 85 percent had annual budget less than $50,000. When EDAs were asked why they had given low or no priority to aviation-related programs, the EDAs gave the following reasons:

- 51 percent believed the people in their community had made no demands for such programs,
- 17 percent had no funds for aviation-related programs,
- 17 percent do not include aviation as a goal for their programs, and

- 10 percent are satisfied with the current level of aviation-related programs in their community.

EDAs were asked to indicate the percent of their annual budget spent on aviation-related programs over the past five years:

- 71 percent had spent none,
- 19 percent of EDAs spent between 1 to 5 percent,
- 6 percent of EDAs spent between 6 to 10 percent,
- 3 percent of EDAs spent between 11 to 20 percent, and
- 1 percent EDAs spent between 21 to 35 percent.

EDAs were asked if they had plans to increase expenditures or programming efforts targeted towards aviation-related activity:

- 55 percent had no plans to increase programs targeted towards aviation,
- 13 percent would increase programs within the next year,
- 4 percent would increase programs within the next 2 to 5 years, and
- 27 percent were not sure when they would increase programs targeted towards aviation.

EDA's operating funds come from a number of different sources, including mill

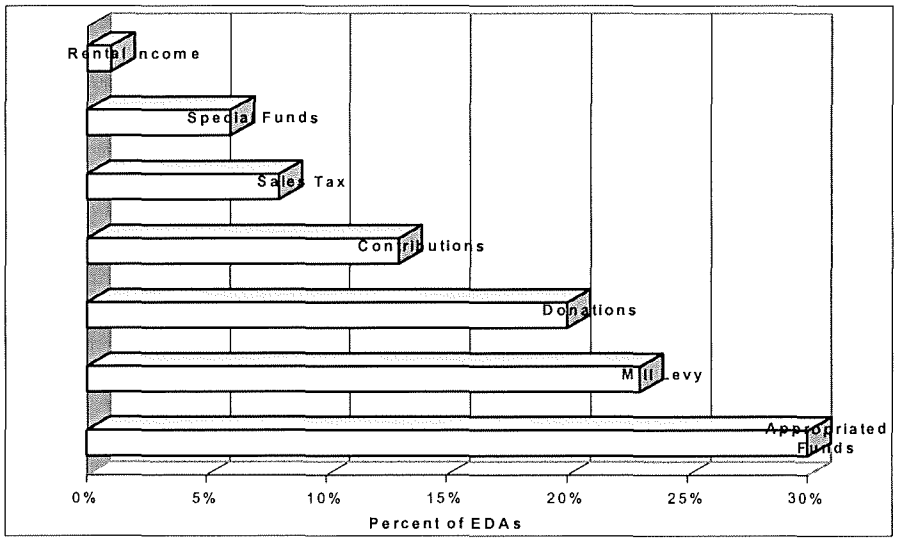
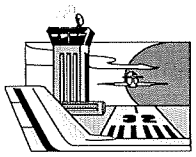


Figure 2.6 *Sources of EDA operating funds*

levy, donations, appropriated funds, rental income, and special funds (Figure 2.6).

Impact of Aviation in Communities with EDAs



A community's "vitality" is the capacity of a community to generate income and employment. This depends on the willingness of the people in the community to adapt to changing conditions, the know-how to use and maintain the resources of the community, and have the desire to measure success in relation to other comparable communities. Communities must recognize that economic development is a long-term effort that cannot be achieved through short-term use of human or physical resources (McDowell 1995).

EDAs were asked to describe the contribution they believed aviation makes toward economic development in their communities (Figure 2.7). Agencies provided the following descriptions:

A. aviation helped market their community as a place to conduct business,
B. aviation helped market their community as a nice place to live,
C. aviation provides employment in their community,
D. local businesses depend on air transportation,
E. people in the community depend on air transportation, and
F. the role of aviation is not clearly defined.

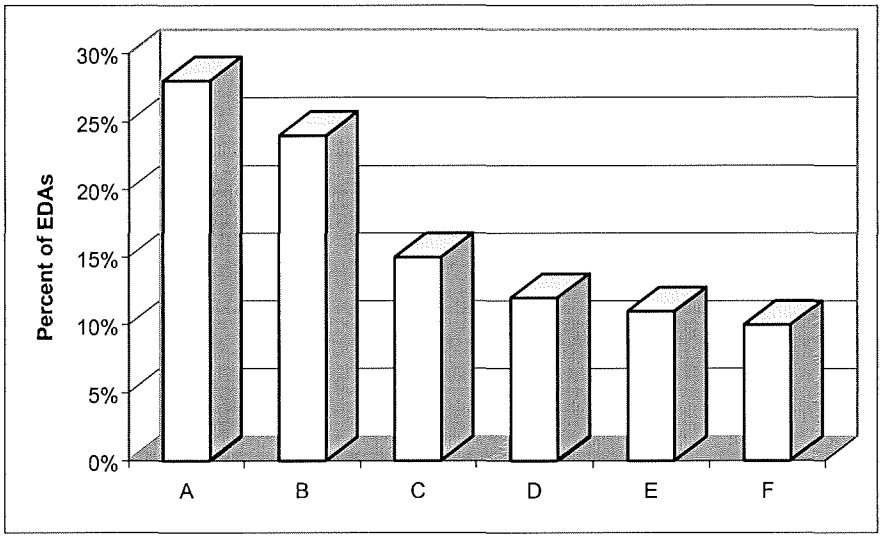


Figure 2.7 *Contribution of aviation in economic development programs. (Letters A through F defined above)*

- More than one-fourth of EDAs (28 percent) believe that aviation helps market their community as place to conduct business,
- almost one-fourth (24 percent) believe that aviation helps market their community as a nice place to live, and

- ten percent believe the role of aviation is not clearly defined.

Among EDAs who implemented aviation-related economic development programs:

- 27 percent encouraged the use of the local airport,
- 22 percent worked to locate aviation-related businesses to their community,
- 17 percent helped improve services at the airport, and
- 15 percent worked towards expanding the airport.

Among EDAs who implemented aviation-related economic development programs:

- 30 percent believe their programs are "highly" successful,
- 29 percent believe their programs are "moderately" successful,
- 19 percent believe their programs are "somewhat" successful, and
- 23 percent believe their efforts have not been successful.

Among EDAs who reported experiencing high, moderate, or somewhat success implementing aviation-related programs:

- 33 percent of EDAs were successful with 30 percent of their programs,
- 33 percent were successful with 70 percent of their programs, and
- 21 percent were successful with 100 percent of their programs.

More than 75 percent of EDAs believe aviation-related activity in their community has either remained the same or increased in the past five year. This group credited several reasons:

- Nearly 60 percent credited improved quality of airport services,
- 17 percent credit improved air service,
- 12 percent believe improved business activity in the community, and

- 7 percent credit having more transportation choices as a reason for increased aviation-related activity in their community.

Increased aviation-related activity can benefit communities by providing employment, contributing to community tax base and adding to community pride. EDAs responding to the survey identified various benefits from increased aviation-related activity in their community (Figure 2.8).

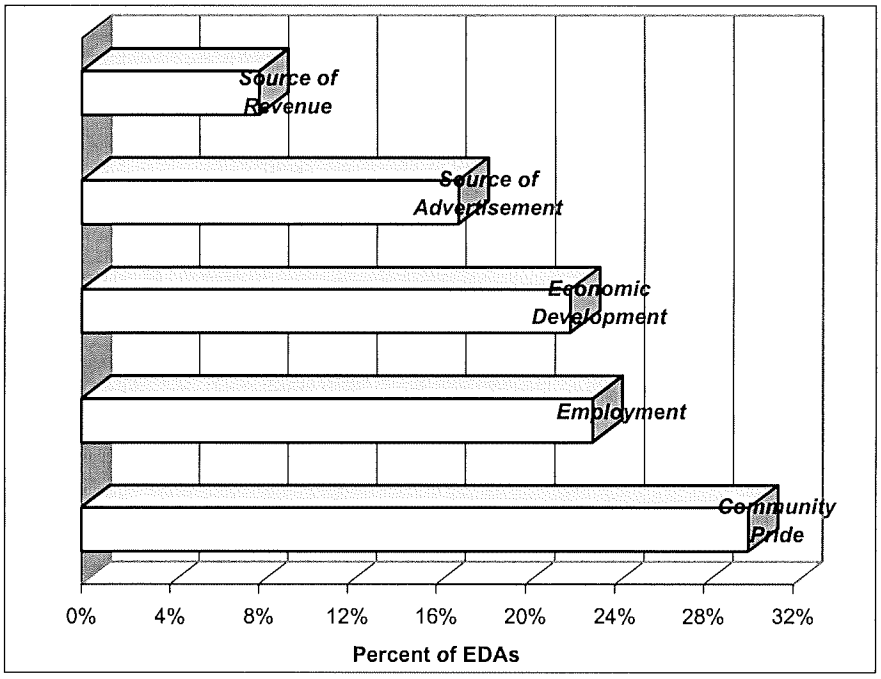


Figure 2.8. *Impact of increased aviation-related activity on the community*

Nearly one-third (30 percent) of EDAs believe that aviation-related activity in their community is a source of pride. EDAs also believe aviation helps create employment, increase economic development, and is a source for advertising and generating revenue for the community.

Only 4 percent of EDAs believe aviation-related activity decreased in their community over the past five years. Reasons for the decrease, include:

- airport needing repairs (33 percent),
- limited availability of scheduled air service (25 percent),
- airport businesses moved out of the community (8 percent)

- reduced aerial application activity (8 percent), and
- airport closed (8 percent).

Among EDAs who believe aviation activity had reduced in their community over the past five years, 90 percent believe the impact of reduced activity was either difficult to measure or may have had no impact on their community.

Aviation Economic Development Programs

Most EDAs in small communities do not have the financial resources to employ experts to assist with economic development, marketing, or research. EDAs were asked, if a research center was designed to assist them in developing economic programs targeted towards aviation, in what area would they like to receive help (Figure 9)?

A. acquiring funding,
B. developing proposals,
C. bringing aviation businesses to the community,
D. promoting the community airport,
E. bring scheduled air service into the community, and
F. educating city leaders on the importance of the community airport.

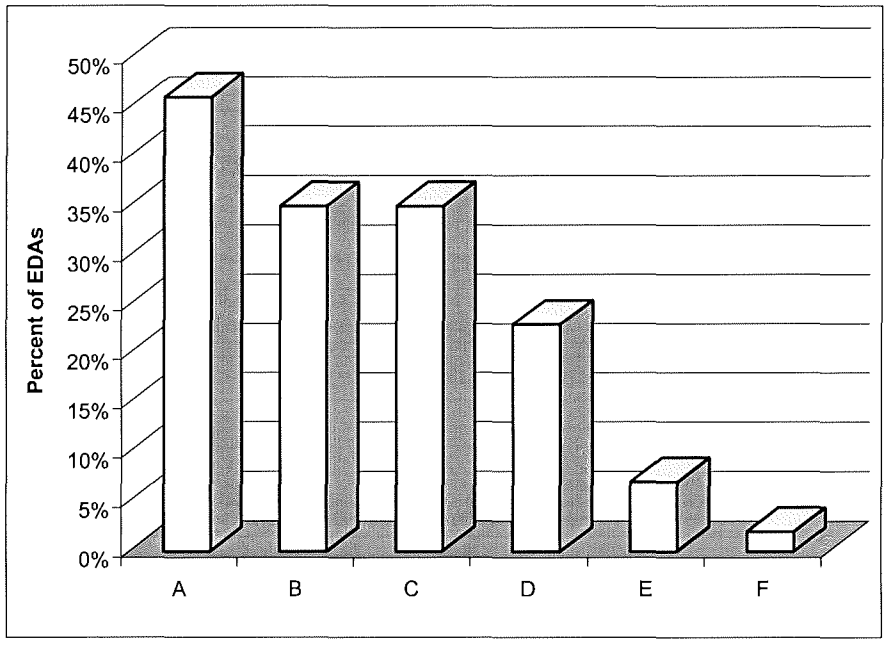


Figure 2.9 *EDAs needing help in these areas (letters A through F defined above)*

Among EDAs planning to increase programs targeted toward aviation and EDAs not planning to increase aviation-related programs (Figure 2.10):

- One-third of EDAs in both groups wanted help in acquiring funding,
- about one-fourth of EDAs in both groups wanted help in developing proposals,
- 20 percent of EDAs who were planning to increase aviation programs wanted help in promoting their local airport versus only 12 percent of EDAs not planning to increase aviation programs, and
- less than 3 percent of EDAs in both groups wanted help with bringing scheduled air service into their community or help educating their city leaders of the importance of the local airport.

A. acquiring funding,
B. developing proposals,
C. bringing aviation businesses to the community,
D. promoting the community airport,
E. bring scheduled air service into the community, and
F. educating city leaders on the importance of the community airport.

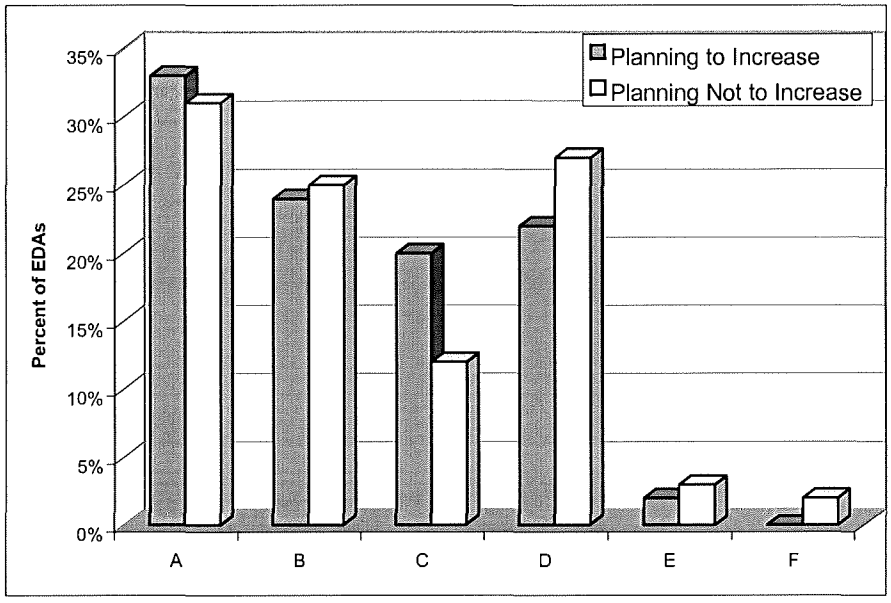
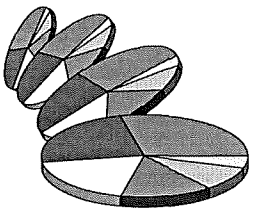


Figure 2.10 *EDAs planning to increase versus EDAs not planning to increase programs targeted toward aviation and help both groups would expect from a research center designed to assist them in developing aviation-related economic development programs*



Only 10 percent of EDAs believe people in their community have a high value for economic development programs targeted toward aviation. The same percent of EDAs place a high priority on aviation-related programs. This is in contrast to responses from more than half the EDAs (52 percent) who believe that aviation activity helps market their community as a place to do business and also helps market their town as a nice place to live.

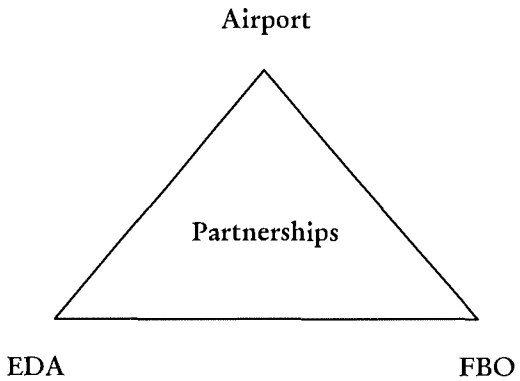
The difference between the value EDAs believe aviation activity offers their community and the level of priority EDA place on aviation programs may exist because 1) EDAs assume that aviation businesses do not need their support and 2) EDAs believe people in the community may not value aviation economic development programs. This is reflected in the survey among the group of EDAs who place either low or no priority on aviation-related activity. More than half the EDAs (51 percent) in this group indicated they did not give high priority to aviation programs because people in their community did not demand it, about 20 percent do not include aviation as one of their economic development goals, and 5 percent believe the aviation industry does not need their help.

In an article about general aviation airports and their relation to local economic development, Peter Van Pelt, director of Southwest Michigan Regional Airport, poses an interesting question. Does the community view the local airport as the front door to economic development or as a doormat, to be stepped on and over? Loretta Scott, an airport manager in Grand Prairie Municipal Airport, Texas, believes that to keep the front door open and the community interested in her airport she must line up support. Scott holds open houses at the airport and invites tenants and government officials to mingle, believing that local community leaders must be involved with the airport rather than view it and its problems from the outside. Scott also believes there are communities that do not know they have an airport and some may consider the airport a nuisance or a place where the rich go to play, instead of looking at the airport as a community asset (Cook 1995). Carolyn Stroke, airport manager of Wood County Airport in Parkersburg, West Virginia also believes in maintaining a strong relationship with the local leaders. She participates in discussions with officials from the convention bureau, city economic development, and the local college (Cook 1995).

In today's highly competitive environment, airport managers cannot assume that customers looking for aviation services would fly to the local airport just because it is there. Neither can EDAs assume that airports can help attract economic

development just because they exist. EDAs and airports must work together to accomplish several goals:

- promote and market the airport and its facilities as a viable transportation asset to the community,
- promote the airport to businesses who would benefit from having easy access to air transportation,
- include the airport in the overall planning for local long-term economic development,
- build relationships with local government and citizen groups to help pursue solutions to symptoms rather than problems,
- FBOs and airport management should share their business plans with each other to build a partnership that takes into account each business needs and goals,
- airport managers should serve as the community liaison to promote the need for feasibility studies, develop marketing strategies, and eliminate potential obstacles that may restrict firms from establishing business at the airport, and
- a three-way partnership between EDA, FBO, and airport management will increase opportunities for improving airport and community economic development.



Chapter 3

Impact of Regulations

"General aviation helps provide social and economic benefits to Americans. Besides providing consumer and business travel opportunities, airports serve as a vital link to health services, law enforcement, disaster assistance, and are an economical focal point for our communities" (Minnesota Flyer Magazine 1995).

Regulations of economic activity in the United States have grown dramatically in this century, radically transforming the relation between government and business (Bailey at el. 1991). Government influence on business activity differs from providing the legal foundation and framework in which business operates to governmental ownership and control (Coyle at el. 1994). Regulations, that affect prices and conditions of services were first applied to transportation and public utilities and later extended to energy, health care, and other sectors. Growth in social regulations started in the early 1970s, focusing on workplace safety, consumer protection, and environmental preservation (Bailey at el. 1991).

Economic activity in the United States is viewed as a private enterprise in which competition is an important requirement. In theory, pure competition exists when products are justified only by the willingness of people to buy them and products should not be sold at a price below the marginal cost of the last unit produced. The theory also assumes that people can assess whether an economic act will make them better off-as producers or consumers-and that people will use personal resources to achieve a more positive life-style (Coyle at el. 1994). The way in which people maximize their self-interest, or make themselves better off, has two sides. First, defining the set of circumstances that will make them happier, and second, operating under constraints. Constraints can originate from various sources. For example, income constraints might prevent the individual from purchasing an aircraft. Institutional constraints might prohibit an action

that is seen as highly desirable, such as no-smoking rules on commercial aircraft. The rules, while improving the environment, prevent smokers from maximizing their self-interest (Dowing 1984).

Policies designed to protect the environment have emerged as major issues on the political agenda. In the 1960s, the environmental movement concentrated on pesticides, air, and water pollution. In the 1970s, the focus was on consumption of energy, overpopulation, and the dangers of nuclear radiation. In the 1980s, the movement added toxic waste hazards, the ozone hole, and the destruction of the tropical rain forest. Then in the 1990s, environmental attention turned to global warming, biodiversity, and revisited population explosion (Fischer and Black 1995).

Environmental statues have influenced the decision-making process of federally funded transportation projects for more than 20 years and are expected to continue to do so in the future. The National Environmental Policy Act of 1996 (NEPA), the basic national charter for protection of the environment, directs federal agencies to evaluate environmental impacts along with economic and technical factors in decision-making. The act stipulates that a detailed environmental impact statement be prepared when assessing each proposal for a major federal action that has the potential of significantly affecting the environment. NEPA has created a more open process for decision-making on transportation projects, encouraging input from other government agencies and the public. More than 30 additional federal environmental statues and executive orders govern federal actions affecting the environment (U.S. Department of Transportation 1990).

The United States Department of Transportation reported in 1995, the benefits to Americans from the nation's transportation systems is high, but those benefits come at a cost that is measured not only in dollars but in accidents, damage to the environment, and our dependence on fossil fuel. Environmental impact from carbon dioxide (CO_2) – the principal man-made "greenhouse" gas has the potential for changing the global climate by a build-up of greenhouse gas in the atmosphere. Transportation is 97 percent dependent on petroleum and accounts for two-thirds of the country's total petroleum use. In each of the above areas, actions have been taken to mitigate the problems created by transportation. Analysis by the Department of Transportation shows benefits have resulted from mitigated actions. For example, had transportation fatality rates remained at the 1972 levels, twice as many lives would have been lost in transportation accidents in 1992. Transportation also would have produced several times as much air pollution and generated 15 percent more CO_2 in using 15 percent more fossil fuel (U.S. Department of Transportation 1995).

Aviation

In the 1970s, the rallying cry was to change the way government regulated industries. Observers of the federal government's regulator agencies argued that regulations raised prices and limited the variety of goods and services available to consumers. Subsequently, regulations were liberalized in the banking and telecommunications industries. But no industry has been affected as greatly as the aviation industry. For nearly 40 years, the industry operated under strict regulation. Deregulation changed all that by allowing air carriers to set prices, and choose the routes they served (Bailey at el. 1991).

Aircraft noise is an unfortunate by-product of air transportation. While quieter new technology is being incorporated into carrier fleets, local airports often impose use restrictions to mollify communities or to meet state laws (Bailey et. al 1991). Airport operators are encouraged to conduct airport noise compatibility planning cooperatively with local agencies, residents, airport users, and the federal government. More than 165 airport operators in the United States have completed noise abatement plans, with assistance under FAA Part 150 program (U.S. Department of Transportation 1990). Regulations that limit noise output from aircraft engines have continued to be added to federal and state statutes. For example, noise-related restrictions on existing capacity have been imposed at 19 of the 35 largest passenger-handling airports in the United States during the past decade. During the same period, noise concerns inhibited expansion at about 12 of the airports (Bailey et. al 1991).

Although government regulations are viewed by consumers as a method of insuring the safety of the products and services they purchase, producers of goods do not always agree. For example, FBO operators, like many small businesses are required to pay a minimum wage to their employees regardless of the size of their business or annual revenue. Large and small FBOs also are required to comply with environmental regulations, which specify how chemicals can be disposed, how aircraft fuel can be maintained in storage tanks at airports, and the method in which chemical spill should be managed. Regulations also govern aircraft maintenance, airport operations, and the safety of the work environment.

Regulations often give rise to controversy. In a commentary about new aviation safety rules proposed by the Department of Transportation, Charles Spence, wrote, "while Congress passes a bill eliminating the federal mandate for a 55-mph limits for automobiles on the highway, new safety regulations were being proposed that would require operators of a 10-seat airplane to comply with the same standards as the operators of Boeing 747 (Spence 1996)." The National Air Transportation Association, which represents air-taxi and cargo companies, warns that the new regulations will cause gaps in essential services. By restricting

time frames in which pilots can work, operations such as air ambulance, organ transfer, and medical staff transportation to remote communities will be placed in jeopardy (Spence 1996).

As much as regulations may impact consumers and producers, history shows that once regulations are firmly established, the beneficiaries–both the regulators and the regulated–resist any relaxation of the constraints providing power and position to the former and protection and profits to the latter (Felton and Anderson 1989).

Impact of Regulation

Aviation Regulations are set forth by the Federal Aviation Administration (FAA), or enacted into law by state legislators such as those adapted as part of the North Dakota Century code. While regulations adapted by states are designed to regulate specific activities within state boundaries, FAA regulations are designed to regulate specific activity within the United States. In addition to regulating civil aviation and commercial space transportation, the FAA encourages the development of air commerce, operates the national air traffic control system, conducts research on the national airspace system, and develops and administrates programs to control aircraft noise.

Although regulations are designed in the interest of the public, public perception can influence the crafting of regulations and the role federal agencies play in managing our national air transportation system. For example: fatalities from aircraft accidents can influence public reaction and therefore influence congress into requiring the FAA to shift its resources more to air safety over the promotion of civil aviation. Public perception about air safety can be effected by what is seen and heard in the media. For example: in 1990, there were 860 fatalities involving U.S. based air carriers, commuter air carriers, air taxi provides, and general aviation combined. This represents less than two percent of fatalities compared to the number of people who died from accidents involving motor vehicle traffic (44,599) the same year (U.S. Department of Transportation 1995). Regardless of the differences in the number of fatalities between aircraft and motor vehicle accidents, the public may have greater concern over aircraft travel safety versus the safety of traveling in motor vehicles.

Regulations may have the potential to close businesses, reduce services, or increase operating cost. For example: in the 1970s, small air charter operators in North Dakota closed their operations because complex regulations made remaining in business unprofitable. Loss of air charter service, limits access to air transportation for rural residents. Loss of an air charter business also results in the loss of jobs and economic activity. FBOs that provide services to charter

operators such as the sale of aircraft fuel and maintenance may experience a loss of business. To counter the loss of air service in rural areas, the government provides subsidies to air carriers know as Essential Air Service (EAS) contracts. In North Dakota, only the cities of Bismarck, Fargo, and Williston are free of receiving subsidies.

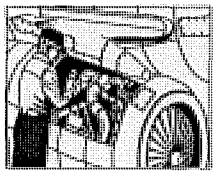
Changes to regulations that govern aerial applicators have added costs to operators by requiring that chemical carried on aircraft used in aerial applications be loaded over specially constructed concrete pads designed to contain chemical spills. Concrete pads can cost between $15,000 to $20,000 to construct. Similarly, airports have to implement measures to contain "storm water runoff" to meet new guidelines established by the Environmental Protections Agency (EPA). Storm water plans can cost airports as much as $1,500 each. In today's climate of potential lawsuits, most flight instructors seek protection by purchasing insurance. The cost of insuring flight instructors has steadily been rising over the past 10 years. Many flight instructors in North Dakota are choosing not to instruct because the cost of insurance is making it unprofitable to remain in business.

In the last decade, many FBOs in North Dakota have had to change the way they conduct their operations or risk losing their businesses. For example: small FBOs were able to offer many of the services provided by today's full-service FBO. These included: aircraft fuel sales, aircraft maintenance, aircraft sales, air charter and air taxi service, flight instruction, hangar and tie-down rentals, aerial application, and specialized work, such as: aircraft painting and aircraft interior rework. Today, small FBOs are forced to cut back on the services they provide and some limit their services to specialized work. This change is due in part to the cost of liability insurance, compliance to new regulations, and increased competition.

Chapter 4

Economic Loss Resulting From Closure of Airport Businesses

"If an airport has an FBO, it is another buffer against an airport closure, provided the FBO is used. Paying more for a gallon of gas, buying the maintenance, headsets, and batteries from the local FBO helps keep it in business. Shut down the FBO and the airport is just one step away from closing its doors" (Coffey 1996).



Fixed-base operators (FBO) are the cornerstones of general aviation (GA), offering flight training, aircraft and fuel sales, aircraft maintenance, hangar and tie-down rental, air taxi, and aerial application services. In 1980, there were 10,121 FBO nationwide. A decade later, that number had dropped by 66 percent to 4,465 FBO (Figure 4.1). Experts predict that by the year 2000, there will be less than 2,000 FBO in the United States (Dornheim 1993).

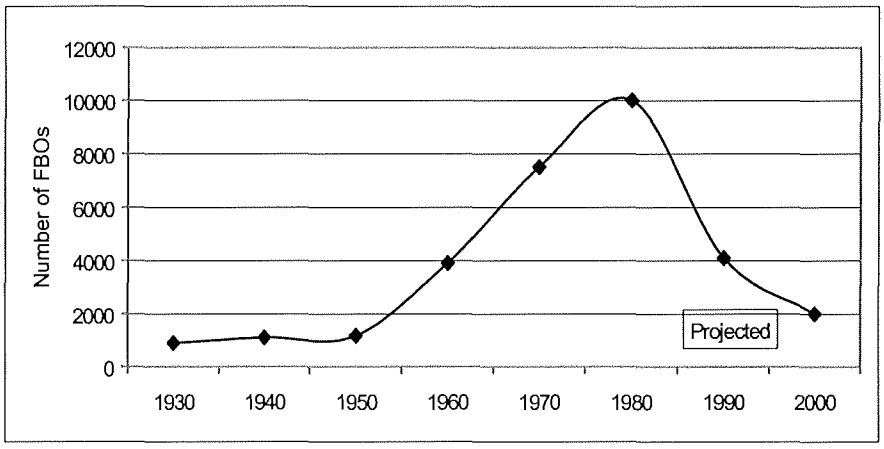


Figure 4.1. *Estimated number of FBOs in the United States.*
Source: Aviation Week and Space Technology, September 1993

Why are FBOs reducing in numbers? Aviation experts suggest there are a number of reasons for the steady decline, including the high cost of operating a business with low return on investment, fewer new aircraft sales, regulations, and limited capital for expansion. A survey of 100 airport and FBO operators in North Dakota revealed that 75 percent of the operators were concerned about the lack of capital and the same percent also were concerned about continued financial support from local government. Nearly 60 percent were concerned about increased regulations and 55 percent were concerned about the high cost of liability. When asked which measures would help resolve their concern, nearly 75 percent of airport and FBO operators indicated eliminating burdensome regulations. Sixty-nine percent indicated reforming aircraft tort and liability laws (Aziz and Benson 1995). Indeed, regulations have added to the rising cost of operating a FBO. For example, if environmental regulations require an FBO to replace its underground fuel systems, it is estimated the average cost of removing the old system would be $127,000. To install a new one would cost almost $180,000 (Dornheim 1993). Such investment may be beyond the financial reach of small FBOs, forcing them to close operations.

Is society adversely impacted if some FBOs go out of business? Industry experts believe that fewer FBOs-regardless of the reasons they go out of business-may actually benefit the industry by helping the FBOs who remain stand a better chance of being profitable (Dornheim 1993). This suggests that perhaps there are more FBOs than can be supported by the market. As long as there is a demand for aviation services and profits can be made providing those services, many argue, the market will offer a balance between the demand for aviation services and FBOs willing to provide those services. However, to stay competitive, FBOs may have to change the way they do business. Part of that change includes aggressive management that focuses equally on providing what the customer needs and improving operational efficiency.

It may take more than efficiency to increase the profit margin of FBOs. The industry has among the lowest return on investment (ROI) compared to transportation, manufacturing, health care, banking, automotive, and the aerospace industry (Figure 4.2). ROI is a specific charge against the equity capital in a firm and reflects a return needed for economic justification of investment (Casavant 1993). Low returns hardly provide the incentive for aging FBO to remain in business. Likewise, operators reaching retiring age and once hoped to pass their business to their family may find the next generation less than enthusiastic to take on the risks. FBOs in North Dakota have experienced a mix of changes during the last few decades. While some have added services to attract new business others have reduced them. Air charter service was offered by 43 percent less FBOs in the 1990s over the previous decade. Similarly, 16 percent

fewer FBOs offered aircraft rental in 1990s than did in the 1980s. Among FBOs that increased services, 45 percent offered aircraft sales in the 1980s over the previous decade and that number increased by 7 percent during the 1990s. About

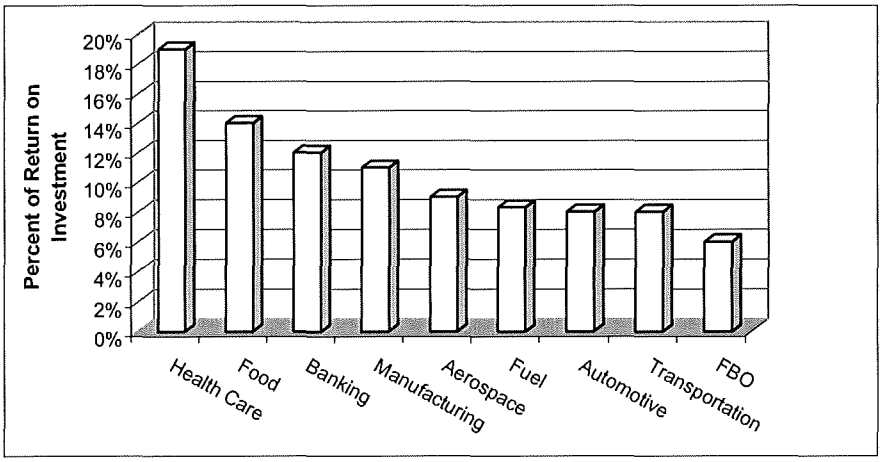


Figure 4.2 *Return on investment (ROI) by industry*
Source: Aviation Week and Space Technology, 1993 (FBO Resource Group, Inc.)

33 percent additional FBOs offered aircraft maintenance in the 1980s over the 1970s and an additional 20 percent offered similar services in the 1990s over the previous 10 years. More recently, FBOs have expanded their operations by constructing new facilities or purchasing existing facilities. At the GA facility in Fargo, FBOs have expanded their operations to include weather modification. In Grand Forks, the FBO has constructed a new facility capable of provided additional services. FBOs in Minot, Dickinson, and Williston have been sold to new businesses that hope to offer additional services.

Pilots are the backbone of FBOs, purchasing fuel and maintenance services, leasing aircraft and hangars space, and learning to fly. In 1983, nearly 100,000 people applied for student pilot certificates in the United States (Figure 4.3). That

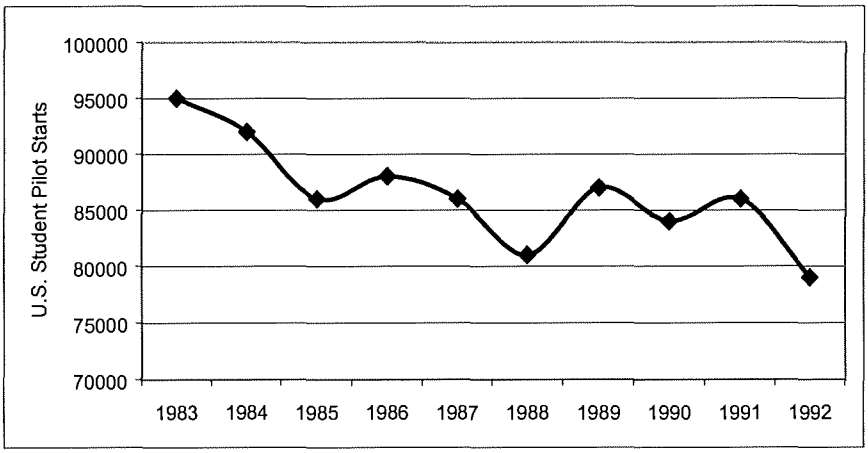


Figure 4.3 *Student pilot starts in the U.S. between 1983 and 1992*
Source: Business and Commercial Aviation 1993 (AOPA)

number began a gradual decline through the mid 1980s an early 1990s. In 1992 pilot starts sank to a 20-year low, dropping below 80,000.

Declining student pilot enrollments forced many FBO to stop offering flight instruction. Today it is estimated that only one in every eight FBOs offers some degree of flight training (Gilbert 1993). In North Dakota, the number of FBOs offering flight instruction grew by 36 percent between the 1970s and 1980s, however 23 percent of FBOs stopped offering flight instruction during the 1990s. Not everyone who starts flight training completes it. In a study commissioned by Aircraft Owners and Pilot's Association (AOPA), researchers tracked pilots from 1987 to 1994 to determine if students completed their aircraft training, maintained their flying privileges, or dropped out of the program. The study found more than 34 percent of student pilots dropped out of the program (Figure 4.4), less than half of one percent moved toward a commercial pilot certificate,

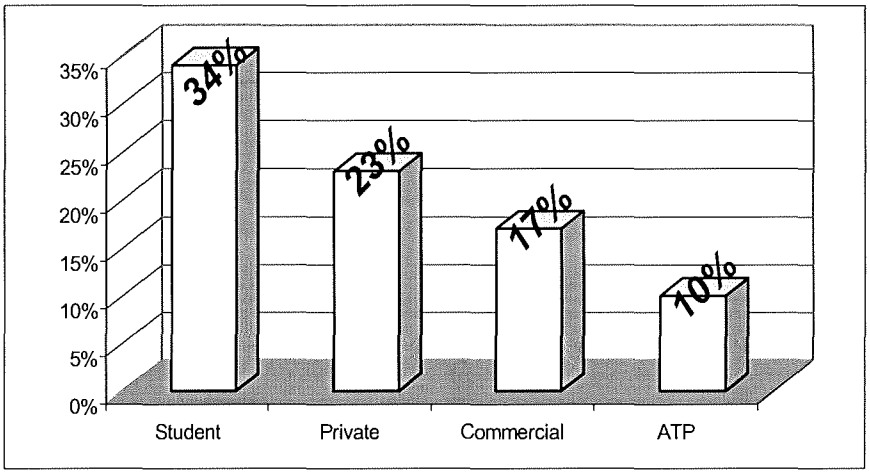


Figure 4.4. *Drop off rates of pilots in student, private, commercial and ATP programs*
Source: Aircraft Owners and Pilots Association:, Research for Industry Action

almost 14 percent became private pilots, and 50 percent remained students. Among private pilots, 23 percent dropped out of the program, 3 percent moved ahead to a commercial pilot certificate and 74 percent remained private pilots. The dropout rates among commercial and ATP programs were less than the dropout rates among those in student and private pilot programs. Only 17 percent of commercial pilot and 10 percent of ATP pilots dropped out of the program (Aircraft Owners and Pilots Association 1995).

The sale of aircraft also impacts business at FBOs. Higher aircraft sales equate to increased volume of fuel sales and increased sales of aircraft maintenance and other related services. There are more than 330,000 piston-engine aircraft worldwide. Over 88 percent (290,000) are single-engine and out of those nearly

71 percent (206,000) are registered in the United States. This makes the United States a dominant player in the single-engine piston aircraft industry. Canada ranks second with 6 percent of the worldwide single-engine aircraft and Germany ranks third with 2 percent (Aviation Consulting Incorporated 1994). More than 14,000 single-engine piston aircraft were sold in the United States by 1978 (Figure 4.5). During the 1970s, aircraft manufacturers introduced several new training aircraft models such as the Cessna 152, Piper Tomahawk, and Beech Skipper. At the same time, the economic climate helped aircraft sales. High inflation rates made the value of aircraft likely to increase over time, spurring sales of new equipment. Sixteen years later, that number fell to 450 in 1994 (General Aviation Manufacturers Association 1996). The decline in sale of new aircraft partially was due to over supply and mostly due to an increase in product liability lawsuits. The cost of defending product liability lawsuits increased costs on manufacturers of piston aircraft.

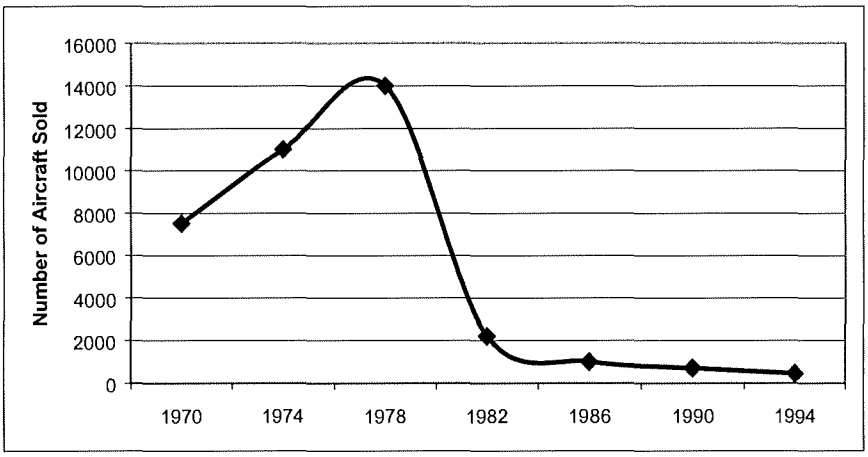


Figure 4.5. *Sale of single-engine piston aircraft in the United States*
Source: Blueprint for Growth 1996. General Aviation Manufacturers Association

It is estimated that liability cost for aircraft manufacturers rose from $51 per aircraft in the 1960s to nearly $70,000 in the mid 1980s (Aviation Consulting Incorporated 1994). This also increased the price of small aircraft nearly 75 percent, making purchase of a new aircraft out of financial reach for many potential buyers. Between 1976 and 1995, the cost of owing a single-engine piston aircraft (purchase price and interest) rose from more than $56,000 in 1976 to $218,000 in 1995 (not adjusting for inflation). The high cost of owning an aircraft also impacts the ROI. In 1976, ROI on an aircraft purchase was estimated at 18 percent (Figure 4.6). Ten years later, ROI fell to minus 2 percent and in 1995 ROI on ownership of an aircraft was estimated at minus 10 percent (General Aviation Manufacturers Association 1996). Investment in new aircraft

continued to drop even though the per capita disposable income among Americans began to rise. The U.S. government report a steadily rise in disposable income of $5,000 in 1974, to more than $8,500 in 1980, and more than $16,000 in 1990 (Aviation Consulting Incorporated 1994).

In 1994, President Clinton signed into law the General Aviation Revitalization Act, which imposed an 18-year statute on liability exposure for aircraft manufacturers. The act shields manufacturers and their suppliers from the cost of liability rising from older aircraft. It is estimated that 25 percent of piston-engine aircraft are more than 35-years old (General Aviation Manufacturers Association 1996). The act was the first tort reform legislation to be signed into law in the United States and aviation experts predict that it was responsible for creating nearly 4,000 new general aviation manufacturing jobs in 1996. The real test of product liability reform will be the extent to which reform reduces the manufacturers' liability costs and the extent to which manufacturers pass the savings to consumers in the form of reduced prices (Aviation Consulting Incorporated 1994).

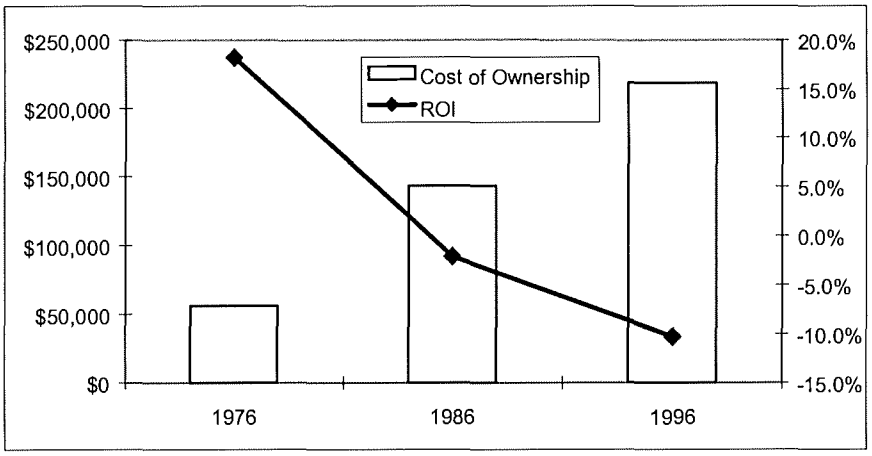


Figure 4.6 *Non-adjusted cost of ownership and return on investment on aircraft purchases*
Source: Blueprint for Growth 1996. General Aviation Manufacturers Association

The challenge for an FBO is meeting the needs of its customer. This criterion is most important and one used by aircraft operators when choosing a FBO. In a survey conducted by Business and Commercial Aviation, turbine aircraft operators were asked which FBO service they most sought (Figure 4.7). Nearly 400 turbine aircraft operators responded to the survey. The most important service preferred was passenger needs (72 percent). The next most preferred service was 24 hour access to the FBO, followed by low fuel prices (48 percent),

the willingness to accept credit cards (45 percent) and vehicle access to aircraft (45 percent) (Searles 1993).

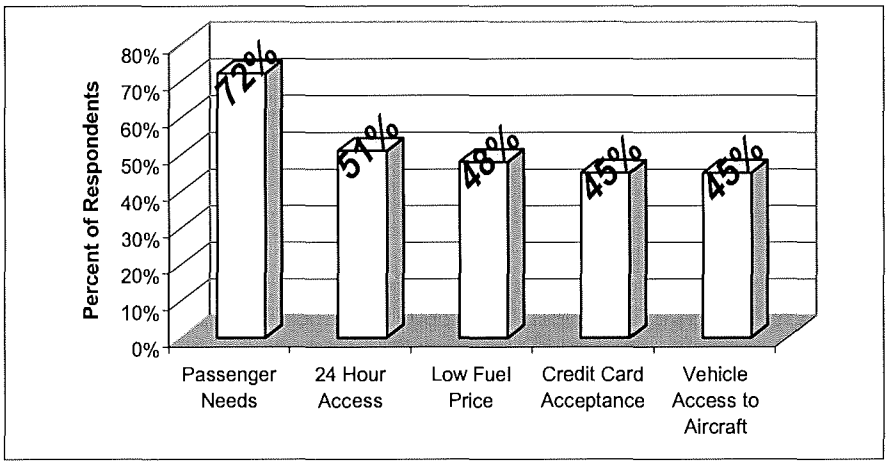


Figure 4.7 *Five most important FBO services for turbine aircraft operators*
Source: Business and Commercial Aviation 1993

The survival of airports in rural America is often tied to the success of the local FBO. FBOs and airports that tailor services to meet the demands of their customers increase their chances of survival. Airports and FBO that are unwilling or unable to changes their business practices are soon forced out of business. Between 1970 and 1995, 16 airports in North Dakota closed their operations, including:

Airport	Year Closed	Reason
Wyndmere	1995	Lack of activity
Glenburn	1995	Liability risk and low activity
Reeder	1993	Poor runway condition and low activity
Medora	1992	Airport safety concerns
Lake Williams - Robinson	1992	Low activity
Noonan	1987	Low activity and high operating cost
Center	1986	Poor runway condition and high operating cost
Makoti	1986	Liability risk and high operating cost
Drake	1986	Liability risk, low activity, and high operating cost
Underwood	1985	Low activity and concern over airport safety
Portal	1984	Low activity and high operating cost
Wimbledon	1983	Low activity and liability risk
Steele	1981	Low activity
Sherwood	1979	Low activity
Forman	1971	Too close to another airport
Ray	1970	Low activity

Table 4.1 *Airports in North Dakota closed between 1970 and 1995 and reason for closure*
Source: North Dakota Aeronautics Commission 1995

While the reasons for closing range from low aircraft activity to high cost of liability and from concern over safety to high operation cost, the outcome remains the same. Airports and FBOs depend on each other. If one closes, the other soon follows. The North Dakota Aeronautics Commission estimates that over 20 percent of the state's pubic-access airports are in danger of closing their operation in the next 10 years. The estimate is based on several factors, including: types of service provided by FBOs, number of years an FBO has been in operation, number of aircraft based at the airport, number of pilots located in the surrounding area, cost of liability to maintain the airport, and the direction of the community's economic future. These factors do not guarantee an airport will close, but serve as a indicator that the airport may close if there is no changes in demand for aviation services.

Approximately 21 airports in North Dakota are considered endangered and projected to close by year 2010 (Figure 4.2). Among these airports, 18 do not have an FBO and all have less than 10 aircraft based at their facilities.

Airport	1990 Population	1995 Aircraft Based	1995 Operations	1995 FBO Status
Columbus	223	4	1,000	None
Elgin	765	2	200	None
Enderlin	997	3	2,000	None
Gackle	450	0	100	None
Glen Ullin	927	5	1,000	None
Grenora	261	1	400	None
Hazelton	240	1	100	None
Hebron	888	3	400	Mechanic
Inkster	95	1	200	None
Kulm	514	2	300	None
LaMoure	970	8	2,000	Agriculture
Leonard	31,310	2	1,000	Agriculture
Lidgerwood	799	0	200	None
McClusky	492	1	300	None
McVille	559	0	100	None
Milnor	651	2	200	None
Plaza	193	0	100	None
Regent	268	2	100	None
Richardton	625	0	100	None
Westhope	578	2	400	None
Wishek	1,171	2	700	None

Table 4.2 *Airports in North Dakota projected for closure by year 2010*
Source: North Dakota Aeronautics Commission 1996

Without an airport, these communities may not be able to attract new businesses or retain existing businesses. Without new industry moving into rural areas to help sustain economic growth and employment, small communities risk closing their towns.

Economic Impact of FBOs in North Dakota

The economic impact on a community resulting from either a gain or loss of a FBO is questioned when communities entertain discussion about funding airport projects. In other words, communities with airports want to know what the benefits are and costs are when a new FBO opens for business or an existing FBO closes its doors. Such questions seek to measure the value of an FBO in a way that quantifies "worth," so community leaders can determine if it is worth the effort (return on investment) to attract new FBOs or keep existing FBOs in business. Efforts may include economic development programs targeted towards generating aviation activity and providing incentives in the form of low interest loans, tax exemptions, and special mill levies.

FBOs at small GA airports generally have a workforce of one to five employees. Primary sources of revenue for small operators include fuel sales, aircraft maintenance, and aerial application. Large operators can receive additional revenues by providing air taxi service, flight instruction, hangar rental and turbine-engine maintenance, and aircraft sales. FBOs with large operating budgets also have a large workforce. In a survey of FBOs in the United States, nearly 44 percent reported having a workforce of less than 15, 24 percent had a workforce between 16 and 30, 17 percent between 31 to 50, and 14 percent had a workforce of more than 50 (FBO Resource Group 1995).

There are primary and secondary economic impacts resulting from a new business starting or an existing business closing. Examples of primary impacts include expenses directly related to the business, such as employment, capital investment, and rents. Secondary impacts would include expenditures incurred by employees of the business to purchase homes, food and clothing, etc. Primary impacts are easier to estimate than secondary impacts since jobs gained or lost and capital investments can be quantified. However, secondary impacts from a FBO with a small workforce are harder to estimate. For example, if a small FBO goes out of business, customers may shift to another FBO in a neighboring community and therefore may not experience loss of service. Likewise, people who lost their jobs may find employment at the neighboring FBOs or within the community at other firms. However, closure of an FBO with a large workforce could have significant impact on the community. Not everyone who lost their jobs may be able to find employment. Unemployed workers may have to sell their homes and move out of the community. Firms that supply goods and services to the FBO and those firms that rely on expenditures from the workers of the FBO could experience a loss of business.

The input/output model was used to determine the potential impact of economic activity resulting from the operation of a FBO. The model was developed over a

20-year period and was designed to describe the linkages or interdependencies among the various sectors in an economy. The economy may be the national economy or an economy as small as that of a multi-county area (Coon et. al 1985). Economic activities are defined as activities that bring dollars into a state or region in return for products that are exported. For example, suppose a regional economy, such as an aircraft manufacturer, produces a product that is shipped (or flown) from the area. The aircraft manufacturer receives payments from outside the area and uses part of the payments to pay for the inputs used in producing aircraft. The costs are, in turn, revenues to the secondary businesses, which serve and support the aircraft manufacturer. The survival of an economic unit depends on its ability to produce products and sell them at a price that is high enough to pay the cost of production, including the market value of the use of the producer's own resources. The payment the manufacturer makes to other firms for inputs purchased are revenues to trade and service industries. If the aircraft manufacturing industry expands, there will be a demand for additional output from the trade and service business, and vice versa if the industry shrinks (Coon et. al 1985).

The model has several uses, to: study the economic contribution of specific sectors of the economy, evaluate the impact of expansion or contraction of a sector, estimate secondary employment, and forecast potential tax revenues (Coon et. al 1985). Production by one sector requires the use of inputs, such as materials, equipment, fuel, services, labor etc., by that sector. The inputs are referred to as the direct requirements for that sector. Some inputs may be purchased from out of state, but many will be produced by and purchased from other sectors in the area economy. Other sectors will require inputs from yet other sectors, and so on. The additional rounds of input requirements generated by production of the direct input requirements are known as the indirect requirements (Coon et. al 1985). For example, an FBO may purchase aircraft parts from a local aircraft part supplier, who in turn buys individual component to build the aircraft part from the aircraft manufacturer, which the vendor then sells to the FBO.

The model uses 18 economic sectors (Appendix C). Computations in the model are based on the dollar volume of trade each sector has with every other sector of the economy. The model uses interdependence coefficients, which include the total (direct, indirect, and induced) requirements per dollar of output for final demand. Table 4.3 is a partial list of the interdependence coefficient. Each number in the interdependence coefficients indicates the total output required by the row sector per dollar of output for export from North Dakota by the column sector.

For example, Table 4.3 indicates that each dollar of production in the transportation sector (SIN 5), will generate a gross income in the transportation sector of $1.01 (the $1.00 for production of transportation plus $. o1 of output by the transportation sector for replacement of equipment and material produced and consumed by anyone in the state who is involved in the production of transportation-related goods). Similarly, each dollar of production of transportation-related goods will generate a gross income of $0.55 to retail trade sector (SIN 8) and $0.79 to household sector (SIN 12). Household sector mostly includes wages, salaries, and rents, and a total gross income of all sectors in the state of $3.05. Thus, each dollar of income received from goods related to the transportation sector returns more than three times in the state or it could be said the transportation "multiplier" is 3.05. The multiplier effects results when each producing sector buys some fraction of its inputs from other sectors of the economy and these sectors, in turn, use some fraction of that income to buy some of their inputs from still another sectors, and so on. In other words, the multiplier effects is due to the spending and re-spending within the economy of part of each dollar that enters the state through payment for products that are exported from the state.

		Sector Identifier Number (SIN)				
SIN	Sector	1	2	3	4	5
1	Agriculture Livestock	1.21	0.08	0.04	0.03	0.05
2	Agriculture Crops	0.39	1.09	0.02	0.01	0.02
3	Nonmetal Mining	0.01	0.01	1.04	0.03	0.01
4	Construction	0.07	0.08	0.05	1.05	0.05
5	Transportation	0.02	0.01	0.03	0.01	1.01
6	Communication & Public Utility	0.09	0.08	0.16	0.06	0.08
7	Agriculture Processing & Misc. Mfg.	0.57	0.16	0.03	0.02	0.03
8	Retail Trade	0.71	0.81	0.52	0.41	0.55
9	Fin. Ins. & Real Estate	0.15	0.17	0.11	0.08	0.12
10	Bus & Personal Services	0.06	0.07	0.04	0.03	0.05
11	Bus & Social Services	0.07	0.06	0.06	0.04	0.05
12	Households	1.05	0.96	0.84	0.61	0.79
13	Government	0.10	0.10	0.09	0.05	0.26
14	Coal Mining	0.00	0.00	0.00	0.00	0.00
15	Thermal-Elec. Generation	0.00	0.00	0.00	0.00	0.00
16	Petroleum Exp/Ext	0.00	0.00	0.00	0.00	0.00
17	Petroleum Refining	0.00	0.00	0.00	0.00	0.00
18	Recreation and Tourism	0.00	0.00	0.00	0.00	0.00
	Gross Receipts Multiplier	**4.49**	**3.69**	**3.03**	**2.44**	**3.05**

Table 4.3 *Partial list of interdependence coefficients used in the input-output model for North Dakota*

To estimate the economic impacts of a new business, information on expenditures, which will be injected into the respective sectors of the economy during the construction and operation phase of the business, are needed. The expenditures are multiplied by the appropriate interdependence coefficients

(Appendix C) in the model to provide estimates of gross income changes for the respective economic sector that are attributable to the construction and operation of the new business. Typically, new income is injected during the construction phase of the business and primarily through three sectors. First, the construction sector, which includes expenditures to the construction industry; Second, the retail trade sector, which includes expenditures for materials purchased in the state; and finally, the household sector, which includes payroll of employees not already included as part of the expenditures to the construction sector. New income is injected into the economy during the operating phase of the new business primarily through two sectors. First, the retail trade sector for materials purchased from other firms and second, the household sectors from where the new business payroll begins after it starts operating (Coon et. al 1985).

To determine the economic impact of FBOs on rural communities, three operators from North Dakota airport were selected (Table 4.4). FBO (A) had an annual operating budget of less than $50,000 and was considered representative of a small-sized operator. FBO (B) had an annual operating budget greater then $51,000, but less than $500,000 and was considered representative of a medium-sized operator. FBO (C) had an annual operating budget of more than a million, and was considered representative of a large-sized operator. Salary, capital, real estate, and other operating expenses for each FBO were included in the model.

	Fixed-Base Operators		
Expense Categories	A	B	C
Salary	5,000	300,000	90,000
Capital	14,000	2,000	30,000
Real-estate	0	6,000	5,000
Other Expenses	20,000	164,000	1,501,000
TOTAL	**39,000**	**472,000**	**1,606,000**

Table 4.4 *North Dakota FBOs expenditure data used to demonstrate economic impact via the input / output model*

The annual operating expenditures for FBOs A, B, and C from Table 4.4 were applied to the interdependence coefficients. The model yielded results, listed in Table 4.5.

Sector	Fixed-base Operators		
	A	B	C
Agriculture Livestock	$3,000	35,000	141,000
Agriculture Crops	1,000	13,000	51,000
Nonmetal Mining	0	2,000	5,000
Construction	16,000	35,000	92,000
Transportation	0	5,000	17,000
Communication & Public Utility	2,000	41,000	91,000
Agriculture Processing & Misc. Mfg.	1,000	20,000	73,000
Retail Trade	35,000	437,000	1,994,000
Fin. Ins. & Real Estate	3,000	67,000	110,000
Bus & Personal Services	1,000	22,000	36,000
Bus & Social Services	2,000	35,000	52,000
Households	24,000	540,000	769,000
Government	2,000	40,000	71,000
Coal Mining	0	0	0
Thermal-Elec. Generation	0	0	0
Petroleum Exp/Ext	0	0	0
Petroleum Refining	0	0	0
Recreation and Tourism	0	0	0
TOTAL	**91,000**	**1,293,000**	**3,501,000**
SECONDARY EMPLOYMENT	**0**	**8**	**30**

Table 4.5 *Result of applying annual operating expenses of sample FBO to the interdependent coefficient.*

- FBO (A) yielded business activity in 11 sectors. More than $90,000 in business activity occurred as a result of the original $39,000 in expenditures. The multiplier effects for these expenditures was 2.33-for each dollar spent, $2.33 was generated, the original dollar plus $1.33 in additional business activity.

- FBO (B) yielded business activity in 13 sectors, generated $1,293,000 in business activity from the original $472,000 in expenditures, and created eight secondary employments. The multiplier effect of these expenditures was 2.74.

- FBO(C) yielded business activity in 13 sectors, generated $3,501,000 in business activity from the original $1,606,000 in expenditures, and created 30 secondary employments. The multiplier effect of these expenditures was 2.18.

Strategies

FBOs face many growing challenges in a continuously changing aviation environment. The key to success may lie in growth through acquisition,

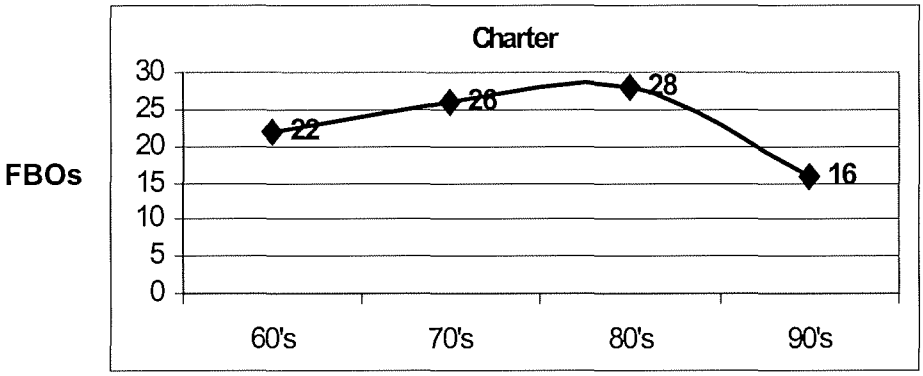
downsize into a specific niche in the market, and affiliate into a chain (Dorheim 1993). General aviation plays a pivoting role in our nation's air transportation system. Regardless of its size, an airport serves the transportation sectors similar to the train station, truck terminal, and water port, providing a place for goods and people to be moved safely and efficiently. The airport also provides an economic focal point for the community. Economic impact analysis suggests that for every dollar spent on aviation resources, the community can experience additional $1.52 in related revenues.

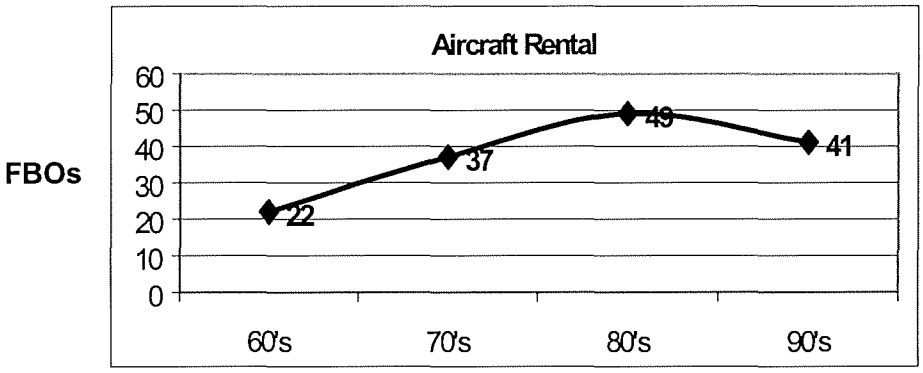
While airports in North Dakota can have important social and economic impact on the state, the ultimate value of the airport is its accessibility to pilots and aircraft, while it serves as the front door to economic viability. If airports in small communities are to survive people have to commit resources to insure that FBOs remain viable as well. Part of insuring viability is purchasing the services sold by the local FBOs. Airports, FBOs, and EDAs must join together to educated residents and policy makers on the long-term benefits of supporting their local transportation facilities. In addition, FBOs and airports should build service partnerships with other airports and FBO in the region. For example, one FBO can specialize in painting aircraft while another may specialize in aircraft interior work. Both FBOs can jointly market their services, share capital investments, and the cost of promoting their businesses, and direct customers to each other's facilities.

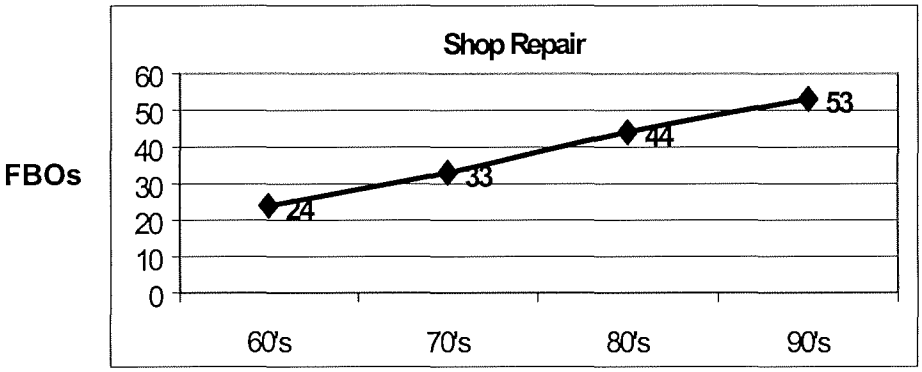
Airports can build similar partnerships to encourage people in the region to use air service from the local airport instead of driving to the closest large or mid-sized hub airport. By using the local air service, people not only help ensure that air service providers continue to serve their community, they also help the viability of the FBO, which sell fuel and other services to the air service providers.

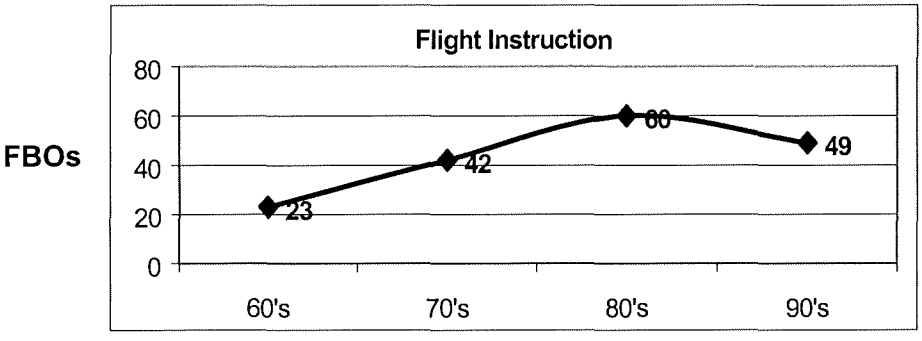
The number of FBOs providing aviation services at airports in North Dakota continues to change between 1960 and 1990. For example, FBOs offering charter service in the 1990s is less than the number of FBOs offering similar services in the 1960s. However, FBOs offering shop repair continues to grow from 24 FBOs in the 1960s to 53 in the 1990s. Trends in aviation services offered at North Dakota airports are depicted on the following charts (Figures 4.6) and include: charter, aircraft rental, shop repair, flight instruction, aircraft sale, aircraft fuel, radio repair, and city fuel sale. The charts do not represent actual data collected over the years, but an estimate in general trend in aviation services at North Dakota airports.

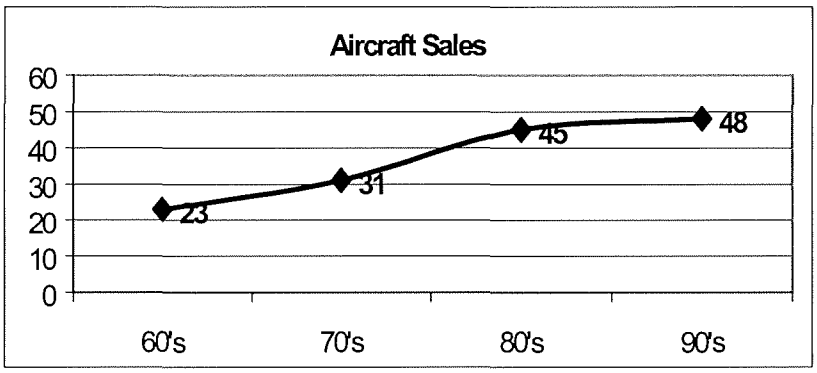
Figure 4.8 *Number FBOs offering various aviation services in North Dakota between the 1960s and 1990s.*

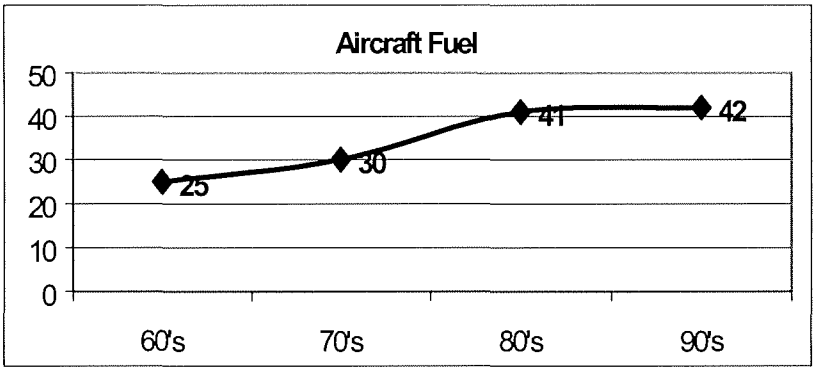









Aircraft Sales
FBOs
60
50
40
30
20
10
0
23
31
45
48
60's
70's
80's
90's


Aircraft Fuel
FBOs
50
40
30
20
10
0
25
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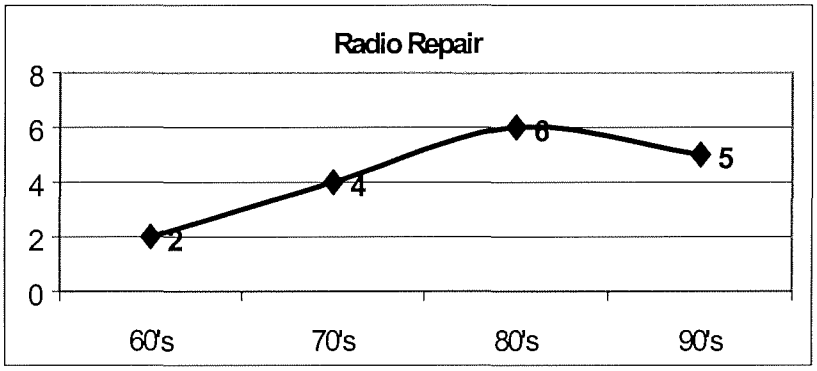
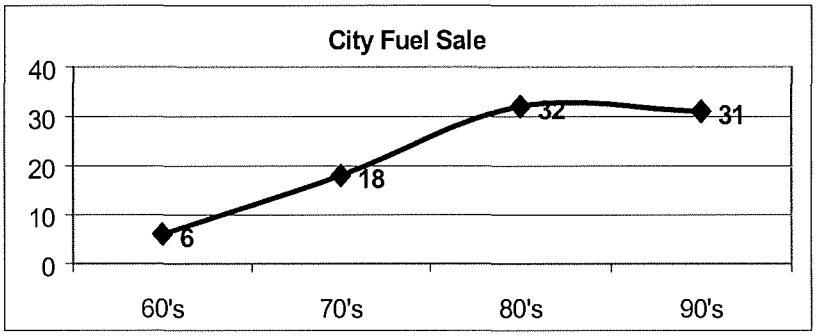
41
42
60's
70's
80's
90's

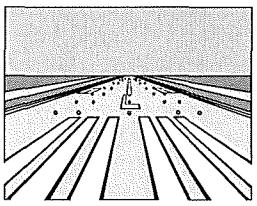

Radio Repair
FBOs
8
6
4
2
0
2
4
6
5
60's
70's
80's
90's


City Fuel Sale
FBOs
40
30
20
10
0
6
18
32
31
60's
70's
80's
90's

Chapter 5

Impact from airfreight, agriculture, and air ambulance Services

"Transport plays multifaceted roles as it moves goods and people between production and consumption centers. Some of its functions are clearly economic, such as providing low-cost reliable mobility, facilitating productions, raising agricultural productivity, exploiting natural resources, and supporting participation in a global economy. Others are non-economic, such as promoting political cohesion, providing greater personal safety in transportation, improving the quality of the environment, and assuring choices and access of the transportation system" (U.S. Department of Transportation 1995).



Air transportation is a vital component of North Dakota's economy. In addition to scheduled air service, provided at eight cities in the state, and pilot training, provided at FBOs and at the University of North Dakota in Grand Forks; the state's air transportation system also includes airfreight, agriculture services, and air ambulance services.

The world's aviation system has been experiencing substantial levels of growth over the past two decades in the number of passengers transported and the volume of daily flights. The volume of cargo shipped by air has steadily increased over the last 10 years (TRA Airport Consulting and Keiser and Associates 1992). The air cargo industry is divided into two major service segments. The modern air cargo providers that supply priority overnight service for critical shipments and second and third day delivery for more conventional freight. Between 1975 and 1986, shipments of overnight packages as a percentage of total airfreight shipments increased from about 54 percent to 92 percent. While airfreight revenues increased by 125 percent between 1980 and 1987,

airfreight still accounts for only 3 percent of freight revenue (U.S. Department of Transportation 1990).

North Dakota Air Freight

In a study commissioned by the American Association of Airport Executives (AAAE) on Air Service Challenges Facing Rural America, researchers found that Airport operators generally do not consider potential profit opportunities associated with handling and processing of cargo (K & H Associates, Inc. 1995). In fact, a study prepared by the North Dakota Aeronautics Commission in 1992, focused on ways in which the underutilized airports in North Dakota may be used to alleviate capacity deficiencies experienced at most of the nation's busiest airports, which cause delays and raise safety concerns for all users of the airway system (North Dakota Aeronautics Commission 1992).

Cargo shipped from North Dakota by air is accommodated at the state's eight largest commercial service airports located in Bismarck, Devils Lake, Dickinson, Fargo, Grand Forks, Jamestown, Minot, and Williston. In 1994, it was estimated that more than 3,260 tons of cargo passed through the state's eight commercial airports. Approximately 25 percent of airfreight that passes through the state are shipped via scheduled air-passenger carrier. Non-passenger air cargo companies ship the rest of the airfreight. Products shipped by air include: heavy machinery, machine parts, beef products, legal documents, mail, bank checks, medical supplies, processed film, flowers, live animals, oil extraction equipment, and farm equipment (North Dakota Aeronautics Commission 1994).

When comparing the tons of freight loaded on scheduled air carriers in North Dakota in 1996 to its neighboring states (South Dakota, Wisconsin, Wyoming, Montana, Nebraska, and Iowa), North Dakota ranked fifth, shipping nearly 9 percent of the total 88,206 freight tons shipped. Wisconsin ranked first, shipping nearly 30 percent of the combined freight tonnage from the above states. Iowa ranked second with 22 percent, followed by Montana (16 percent), Nebraska (10 percent), South Dakota (8 percent), and Wyoming (6 percent) (U.S. Department of Transportation 1996).

North Dakota ranked sixth among the above states in total tons of mail freight (61,802 tons) with 3 percent loaded on aircraft in 1996. Nebraska ranked first with 41 percent, followed by Iowa (25 percent), Wisconsin (22 percent), South Dakota (5 percent), Montana (4 percent), and Wyoming with less an one percent (U.S. Department of Transportation 1996).

Nationally, the volume of freight shipped by U.S. based air cargo companies continues to increase from 3.5 million tons shipped in 1984 to more than 6.3

million tons in 1993 (Federal Aviation Administration 1994). Although, North Dakota's air cargo activity is relatively small globally, there continues to be opportunities for airports in the state to play a part in air cargo shipments regionally and nationally. For example: FBOs sell aircraft fuel to air cargo carriers, perform maintenance on cargo aircraft, and some contract with large air cargo companies to fly freight to small rural communities.

North Dakota Agricultural Service

The concept of using aircraft to spray pesticides and insecticides for pest control on farmland began in 1932, when the U.S. Department of Agriculture believed that aerial application would do less damage to cotton plants than convention ground vehicles. Aircraft could fly close to the field and dispense chemical contents faster than can be sprayed by hand or by ground vehicles. The U.S. government first used military aircraft to test the concept of aerial application. Later, Huff-Daland Airplane Company of Bristol, Penn., designed and built an aircraft especially for dispensing insecticides. The aircraft resembled the German Fokker used during World War I. In 1938, Giro Associates of Morristown, NJ, built an autogiro with rotating wings that looked similar to the rotor wings of a helicopter and measured 45 feet. The autogiro would carry 600 pounds of insecticides and was powered by a nine-cylinder radial engine that produced 300 horsepower (Carmody 1998).

Aircraft used to spray farmlands in North Dakota generally are single engine aircraft with conventional gas powered engines. Nearly 80 percent of public-access airports in North Dakota reported offering some agriculture-related service, mostly by providing aerial application. Among airports that are used for aerial applications, nearly 30 percent have aerial applicators business located on the airport (Aziz and Benson 1995).

In 1985, more than 4.6 million acres of farmland were sprayed by aerial applicators in North Dakota. Acres sprayed by aerial applicators rose by 10 percent to 5.1 million acres by 1996 (Figure 5.1). In 1996, more than 98 percent (363) of the aircraft used in aerial application were owned by commercial applicator businesses and 1.6 percent were privately owned. Among the commercial applicator businesses, 8.5 percent (31) were registered in states other than North Dakota (North Dakota Aeronautics Commission 1997).

The aerial application industry employs more than 650 people in North Dakota and records over 100,000 operation annually. Economic impact from aerial application related activity is estimated to be more than $4 million in North Dakota. In fact, one-third (32) out of the 96 public-access airports in the state are managed by aerial applicator businesses, more than half (59) have an aerial

applicator firms based at the airport, and virtually all the airports are used by aerial applicator firms based outside the state (North Dakota Aeronautics Commission 1994).

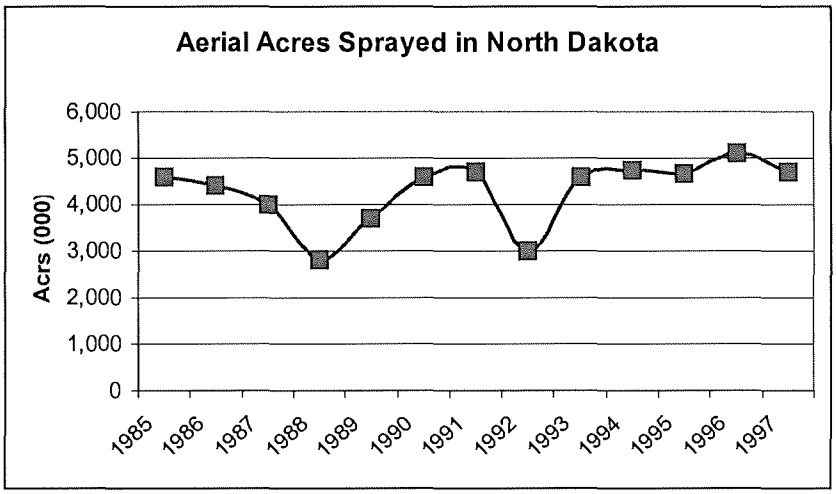


Figure 5.1 *Acres sprayed by aerial application in North Dakota*
Source: North Dakota Aeronautics Commission 1997

Air Ambulance

North Dakota's landmass is approximately 70,655 square miles. Most of the land is used for farming and ranching. Out of more than 400 towns in the state, about .02 percent are considered cities, including Fargo, Grand Forks, Bismarck, Minot, Dickinson, Williston, Devils Lake, and Jamestown. The population of North Dakota peaked in 1930s to about 681,000 and although the population of urban cities has been increasing, the overall population of the state has been decreasing since the 1930s (Bureau of the Census 1990).

People living in larger cities have access to more than one health care facility. The facilities offer the latest technology and medical advances, including intensive care, orthopedic surgery, cardiac rehabilitation, organ and tissue transplants, neonatal intensive care, and alcohol and drug abuse units. Fifty-three health care facilities exist in the state including hospitals, medical centers, health centers, public health services, and government hospitals. In 1995, health care facilities in North Dakota admitted more than 80,400 patients, provided approximately 864,700 out patient services, and incurred more than $720 million in expenses (American Hospital Associations Guide 1995).

Rural residents in North Dakota generally have fewer choices for medical facilities. Rural towns with small populations find it difficult to attract and keep physicians. Increasing costs makes it difficult for facilities in rural areas to provide the latest medical services and some facilities are forced to close their doors (Hamm et al. 1993). For many rural communities, air ambulance is the fastest method of reaching a health care facility that can provide the latest emergency medial services.

Air ambulance or Helicopter Emergency Medical Service (HEMS) providers fly more 180,000 emergency flights annually in the United States. HEMS are used in medical emergencies at the request of the ground ambulance service or Emergency Medical Service (EMS) providers, personnel at health care facilities, or the physician attending to a patient in need of medical care (Aziz 1996). When landing a helicopter, HEMS pilots are tasked with finding a site that provides easy access to transfer patients, while insuring that dust, snow, or gravel are not thrown from the high winds created by the helicopter rotors. HEMS pilots are highly trained pilots and must be able to respond to emergency calls within the shortest time and safest means possible. Pilots must examine weather reports for the destination and weather forecasts for the point of arrival and departure.

HEMS landing areas that have been marked with paint, lights, flags, or other visible devices are known as a mediports. Mediports generally are located near health care facilities, but some are located on private land such as fields, and others are located on public lands such as a city-owned vacant lot. Larger health care facilities build mediports on their rooftop (Aziz 1996). Approximately 51 designated mediports exist in the state (Figure 5.2). HEMS pilots work closely

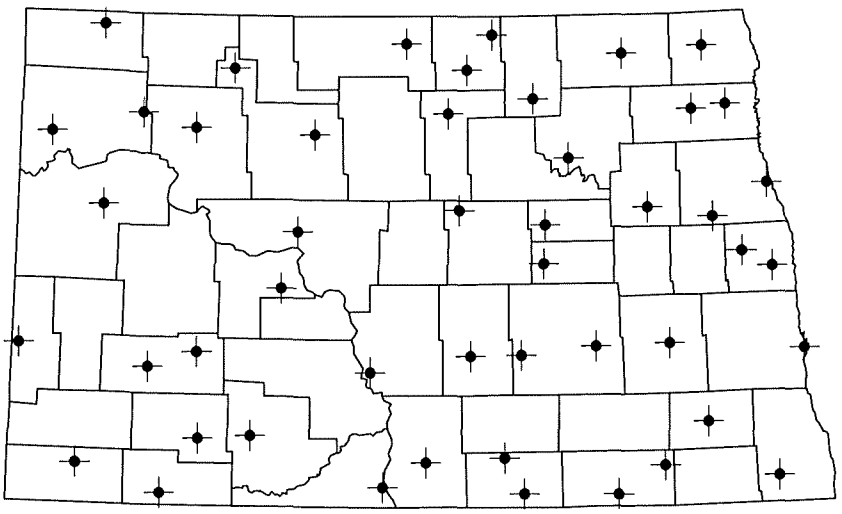


Figure 5.2 *Designated mediports in North Dakota*

with EMS providers when coordinating the intercept location at which patients are transferred between the ground ambulance and the helicopter. HEMS also use the state's 96 public-access airports as landing sites.

North Dakota is served by two HEMS providers located in Fargo and Bismarck and over 136 EMS providers located throughout the state (Figure 5.3). In 1995, EMS personnel in North Dakota responded to approximately 24,000 medical calls. EMS providers also are an important component of community Trauma Transport Plans (TTP). About 100 communities in the state have developed TTPs in cooperation with EMS providers and health care facilities to deliver the most optimal emergency medical responses. The TTPs divide the primary areas served by the EMS providers into zones that identify the closest health care facility to which patients can be transferred and locations where EMS can intercept with HEMS providers. The TTPs help reduce the time EMS need to determine the appropriate health care facility to which patients should be transferred. Rapid access combined with critical care during transport to health care facilities often can improve the outcome of patients, reduce the length of hospitalization, and help contain costs.

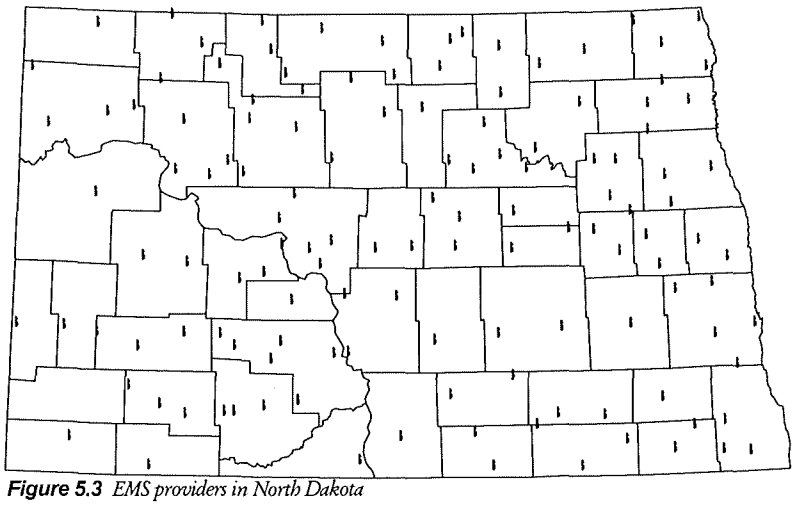


Figure 5.3 *EMS providers in North Dakota*

While HEMS, EMS, and health care facilities are an important part of providing life-sustaining medical services to the people of North Dakota, the impact from the services is beneficial to the individual recipient in terms of quality health care, but the overall benefit to the state is harder to quantify. However, one can assume that lives saved through the use of emergency transportation, such as

EMS and HEMS, and by the skills of highly trained medical professional at health care facilities, returns healthy people back into society to be productive and thus contributes to the economic vitality of their community. We also can assume that people without access to proper health care may place heavier burdens on society by adding to the long-term medical cost, which could have been averted if people had access to timely and quality medical services.

Aircraft and helicopter ambulance operators have provided air ambulance services in North Dakota. Aircraft are used to fly patients and medical personnel between airports in rural areas and airports in cities with advanced health care facilities. Helicopters are used to fly patients and medical personnel between airports or between accident locations and health care facilities. During the 1980s, changes in operating regulations and requirements for licensing air ambulance providers forced changes in the air ambulance industry towards increased use of helicopters. Also, the addition of helicopter landing facilities on rooftops of medical facilities made transporting patients and medical service providers to health care facilities more efficient. As helicopters are used more for air ambulance, the importance of airports as landing facilities for air ambulance lessens.

Conclusion

Fixed-base operators (FBO) often are the front door to a community and can offer more than aviation services to the general public. They often are the first to come in contact with visitors or businesses seeking to learn about the prospects of relocating or expanding into the community. FBOs also can be the link between convenient air service and economic prosperity to the local community. However, the image of General Aviation (GA) airports in the eyes of those who do not use the local airport is often less than positive and can be the difference between getting support for or apposition to the airport.

Over the years, the role of the FBO and airport operator at GA airports has changed. No longer is it sufficient to assume pilots will fly to a facility just because it is there. Nor can one assume that today's users of the airport will return tomorrow. Competition, cost, and a changing global economy requires that FBOs, airport operators, and the community work together to solve problems and shape their future, if desired goals are to be achieved.

For every one airport in North Dakota there are two economic development agencies (EDA). This study revealed that most EDAs in the state have little idea what services their local airport offers and many do not include aviation activity as a priority in their economic development programs. EDAs are a resource that airports and FBOs can tap into to help promote the local airport as a viable economic asset of the community. In communities where EDAs work in partnership with the local airport, the community benefits. EDAs promote access to air transportation to businesses interested in moving to a community and also helps promote the community as a nice place to live. Partnership between the airport, FBO, and EDA can result in increased activity at the local airport, and research shows that investment in the local airport will translate into multiple expenditures and increased employment in the community.

Recommendations

To improve the viability of air transportation assets in a community, airport and FBO operators should:

- Build partnerships with local and regional EDAs to include aviation-related activity in their long-term economic development programs.

- Heighten the profile of the airport by developing relations with the editors of the local newspaper and managers of radio and television stations so they help promote runway and hangar construction projects as a positive initiative for the community.

- Encourage local legislators to develop mechanisms for financing airport business opportunities, which would promote new businesses to locate on site and encourage existing businesses to expand.

- Publish an annual newsletter with articles that magnify the economic contribution of the airport to the community in terms of payroll and number of primary and secondary employment it creates.

- Organize open houses at the facility and encourage local business, legislators, civic groups, and airport tenants to visit with one another and continue to drive home the message that the airport is more than a playground for the "rich and famous."

- Take every opportunity to speak at schools, universities, civic groups, and local government meetings to educate people on the benefits of the airport to the community.

- Focus on improving the quality of services offered to the aviation and non-aviation public, specializing in one or two areas that may bring higher returns than offering too many services at cost of quality.

- Decisions will be made with or without the airport's involvement. Become involved in local and regional politics. It is better to have a say on what is in the best interest of the airport than to have the airport's interest misunderstood.

- Use the literature published by aviation organizations, which offers strategies for implementing programs to promote and enhance the airport's image and helps attract new investment.

- Encourage students in graduate degree programs at nearby colleges to develop their thesis on an airport marketing plans, developing grants and proposals, or to how to bring new air service to the facility. The students benefit from the research and the airport gets a marketing plan.

- Travelers often do not consider the cost of driving, parking, and time when choosing lower airfare that requires driving several hours to a larger city, instead of flying from their local airport. Educate travel agents to educate the public on the benefits of using air service from the home airport.

Next Phase

The next phase of the Airport and FBO impact study will focus on the following topics:

- Study of safety and improvements practiced by FBOs, analyze safety violations at airports and FBOs, compare safety records and practices among airports of similar characteristics, develop suggestions on improving safe airport operations.

- Survey airports on rates and charges applied to aviation services offered at airports in North Dakota and compare charges applied to similar services at airports in the region.

- Identify types of aviation services offered at airports in the state, develop area GIS maps that identify services, develop spatial maps based on revenue and other economic factors, and identify business overlaps and areas of limited service availability.

- Study impact of aircraft fuel sales, maintenance, air taxi, and flight instruction provided by FBOs, identify changes in these services over the last 10 years, study potential economic loss from such services not offered by airports, and determine costs to develop new businesses on airports.

- Present study findings to FBOs, FAA, airport management, and public groups; develop a pan to implement findings in the study, and establish a process to monitor the benefits of programs implemented.

References

Aircraft Owners and Pilots Association. 1995. *Research for Industry Action.* Aircraft Owners and Pilots Association, Washington, D.C.

American Hospital Association. 1995. *American Hospital Association Guide.* American Hospital Association, Chicago, Illinois.

Aviation Consulting Inc. 1994. *Analysis and Evaluation of Manufacturing Opportunities in the Light Airplane Market.* North Dakota Aeronautics Commission, Bismarck, North Dakota.

Aziz, Riaz. 1996. *Mediport Implementation Plan.* Upper Great Plains Transportation Institute Report No. 112, North Dakota State University, Fargo.

Aziz, Riaz and Doug Benson. 1995. *Survey Results of Aviation Activity at North Dakota Airports.* Upper Great Plains Transportation Institute Report No. 109, North Dakota State University, Fargo.

Bailey, Elizabeth E., David R. Graham, and Daniel P. Kaplan. 1991. *Deregulating the Airlines.* The MIT Press, Cambridge, Massachusetts.

Bureau of the Census. 1990. *Census of Population and Housing 1990.* Bureau of the Census, Department of Commerce, Washington, D.C.

Carmody, Douglas. 1998. *Autogiro Crop Dusters.* World Wide Web at CNW.Com.

Casavant, Ken L. 1993. *Basic Theory of Calculation Costs: Applications to Trucking.* Upper Great Plains Transportation Institute Report No. 118, North Dakota State University, Fargo.

Cook, Barbara. 1995. "Small Airports Front Door Doormat?" Pp. 18-34 in *Airport Magazine.*

Coon, Randal C., F. Larry Leistritz, Thor A. Hestsgaard, Arlen G. Leholm. 1985. *The North Dakota Input-Output Model: A Tool for Analyzing Economic Linkage.* Agricultural Economics Report No. 187, Department of Agricultural Economics, North Dakota State University, Fargo.

Dornheim, Michael A. 1993. "FBO Shakeout to Bring Efficiency, Profits." Pp. 64-71 *in Aviation Week and Space Technology,* Washington, D.C.

Dowing Paul B. 1984. *Environmental Economics and Policy.* Little Brown and Company, Boston, Massachusetts.

Due, John F., Benjamin J. Allen, Mary R. Kihl, and Micheal R. Crum. 1990. *Transportation Service to Small Rural Communities: Effects of Deregulation.* Iowa State University Press, Ames.

FBO Resource Group, Inc. 1995. *FBO Questionnaire Results.* FBO Resource Group, Aurora, Colorado.

Federal Aviation Administration. 1994. *American Flag Airline Traffic Enplaned - System Total Large Scheduled Certified Air Carriers Scheduled and Nonscheduled Operations.* U.S. Department of Transportation, Washington, D.C.

Fischer, Frank and Michael Black. 1995. *Greening Environmental Policy: The Politics of a Sustainable Future.* St. Martin's Press, New York.

General Aviation Manufacturers Association. 1996. *Blueprint for Growth.* General Aviation Manufacturers Association Final Report, Piston Engine Aircraft Revitalization committee, Washington D.C.

Gilbert, Gordon A. 1993. "Learn to Fly Flies Again." Pp. 31 in *Business and Commercial Aviation*, Rye Brook, New York.

Goodman, Lowell R. 1996. *The Economic Health of North Dakota.* LRG Properties Ltd., Grand Forks, North Dakota.

Hamm, Rita R., JoAnn M. Thompson, Janet K. Wanzek, and F. Larry Leistritz. 1993. *Medical Services in North Dakota.* Agricultural Economics Statistical Series No. 52, Institute for Business and Industry Development and Department of Agricultural Economics, North Dakota State University, Fargo.

K and H Associates, Inc. 1995. *Air Service Challenges Facing Rural America.* Minneapolis, Minnesota.

Leistritz, Larry F. and Brenda L. Ekstrom. 1990. *New or Expanding, Export-Oriented Firms in the Upper Great Plains.* Agricultural Economics Report No. 256, Agricultural Experiment Station, North Dakota State University, Fargo.

McDowell, Dan. 1996. "The Window to the World." Pp. 21 in *Minnesota Flyer*, Vol 36, No.1, Sandstone, Minnesota.

McDowell, George R. 1995. "Some Communities Are Successful, Others Are Not: Toward an Institutional Framework for Understanding the Reasons Why." Pp. 269-281 in David W. Sears and J. Norman Reid eds., *Rural Development Strategies,* Nelson - Hall Publisher, Chicago.

North Dakota Aeronautics Commission. 1992. *Biennial Report.* North Dakota Aeronautics Commission, Bismarck.

North Dakota Aeronautics Commission. 1994. *North Dakota Aviation: Your Ticket to Economic Growth.* North Dakota Aeronautics Commission, Bismarck.

North Dakota Aeronautics Commission. 1994. *Public-Owned Airports Closed.* North Dakota Aeronautics Commission, Bismarck.

North Dakota Aeronautics Commission. 1996. *North Dakota Airports: Year 2010 Projection.* North Dakota Aeronautics Commission, Bismarck.

North Dakota Aeronautics Commission. 1997. *1996 Spray Report.* North Dakota Aeronautics Commission, Bismarck.

Reeder, Richard J. and Cory Wanek. 1995. "The Importance of Local Airports to Rural Businesses." Pp. 162-183 in David W. Sears and J. Norman Reid eds., *Rural Development Strategies,* Nelson - Hall Publisher, Chicago.

Reid, J. Norman and David W. Sears. 1995. "Reinventing Rural Policy Research." Pp. 1-5 in David W. Sears and J. Norman Reid eds., *Rural Development Strategies*, Nelson - Hall Publisher, Chicago.

Searles, Robert A. 1993. "Great Expectations for FBO Service." Pp. 52-73 in *Business & Commercial Aviation*, Rye Brook, New York.

Shaffer, Ron and Glen C. Pulver. 1995. "Building Local Economic Development Strategies." Pp. 9-28 in David W. Sears and J. Norman Reid eds., *Rural Development Strategies*, Nelson - Hall Publisher, Chicago.

TRA Airport Consulting and Keiser and Associates. 1992. *North Dakota State Air Cargo Feasibility Study.* Seattle, Washington, DC.

Wilbur Smith Associates. 1993. *The Economic Impact of Civil Aviation on the U.S. Economy.* Wilbur Smith Associates.

U.S. Department of Transportation. 1990. "The Unintended Consequences of Transportation," Pp. 43-57 in *Transportation Statistics Annual Report 1995*, Bureau of Transportation Statistics, Washington D.C.

U.S. Department of Transportation. 1995. "Transportation Trends: Safety Transportation Modes," Pp. 85-87 in *National Transportation Statistics 1995*, Bureau of Transportation Statistics, Washington D.C.

U.S. Department of Transportation. 1995. "The Environment," Pp. 4-3 to 7-7 in National Transportation Strategic Planning Study, Washington D.C.

U.S. Department of Transportation. 1995. "Airport Activity Statistics of Certified Air Carriers: Summary Table," Pp. 2-1 to 2-3 in *Bureau of Transportation Statistics Summary Table,* Office of Airline Information, Washington D.C.

APPENDIX A

Survey of Economic Development Agencies in North Dakota on Aviation Activity

Aviation is a vital component of North Dakota's economic infrastructure, providing passenger air service, air freight, air ambulance, agricultural services, and jobs to the local economy. Businesses considering locating or expanding in the state often consider transportation, including scheduled air service, aircraft lease, hangar rental, air taxi services, and the availability of aircraft fuel and aircraft maintenance.

The Upper Great Plains Transportation Institute, in cooperation with the North Dakota Aeronautics Commission and the Federal Aviation Administration, are conducting a survey of Economic Development Agencies in North Dakota. The survey is designed to collect information on the role of air transportation in the economic development programs of North Dakota communities.

The survey will help us gain a better understanding of the economic role of aviation and help develop programs in support of aviation and its related industries in North Dakota. Please help us by completing and returning the survey.

INSTRUCTIONS

1. Please answer all questions carefully.
2. Select the response that best represents your feelings.
3. There are no right or wrong answers and you may select more than one answer unless otherwise indicated.
4. To ensure anonymity, your name will not appear on any part of the published results.
5. When you have completed the survey, return it in the stamped, self-addressed business-reply envelope.
6. Please return the survey as soon as possible.

If you have any questions, please contact:

Riaz Aziz
Upper Great Plains Transportation Institute
P.O. Box 5074, Fargo, ND 58105
(701) 231-8058 Fax:(701) 231-1945
EMAIL: aziz@plains.nodak.edu

DEFINITION

Aviation-related activity includes:

- airport construction, expansion, capital improvements, and service improvements or changes
- air-carrier passenger service and freight service
- general aviation aircraft fuel and maintenance services, hangar and tie-down rental, air taxi, aerial photography and agriculture spray application
- aircraft maintenance and flight training schools.

General

1. **To what degree do you believe people in your community support economic development? (Check One)**

   ❑ High ❑ Medium ❑ Low ❑ None

2. **What is the geographic scope of your agency's economic development program? (Check all relevant responses)**

   ❑ City ❑ Multi-City ❑ County ❑ Multi-County
   ❑ Others (Please specify) _____

3. **What is your agency's average annual operating budget for the past five years? (Check One)**

   ❑ $0 **Go to question 5** ❑ $100 - $5000 ❑ $5,000 - $10,000
   ❑ $10,000 - $25,000 ❑ $25,000 - 50,0000 ❑ $50,000 - $100,000
   ❑ $100,000 - 250,000 ❑ $250,000 - 500,000 ❑ More than $500,000

4. **What is (are) the source(s) of funding for your agency? (Check all relevant responses)**

   ❑ Mill levy funds ❑ Private donations ❑ Business contributions
   ❑ City appropriated funds ❑ County appropriated funds ❑ State appropriated funds
   ❑ Others (Please specify) _____

Aviation

5. **What types of aviation activity are located in your community? (Check all relevant responses)**

   ❑ Aerial Crop Spraying ❑ General Aviation ❑ Air Medical Service
   ❑ Scheduled Air Service ❑ Aviation Education ❑ Aircraft Manufacturing
   ❑ None ❑ Others (Please specify) _____

6. **What is the distance between the center of your community and the closest public-use airport <u>without</u> scheduled air service? (Check one)**

   ❑ 1-5 miles ❑ 6-10 miles ❑ 11-15 miles ❑ 16-20 miles
   ❑ 21-30 miles ❑ 31-40 miles ❑ More than 40 miles

7. **What is the distance between the center of your community and the closest public-use airport <u>with</u> scheduled air service ? (Check one)**

   ❑ 1-5 miles ❑ 6-10 miles ❑ 11-15 miles ❑ 16-20 miles
   ❑ 21-30 miles ❑ 31-40 miles ❑ More than 40 miles

8. **What percentage of your agency's annual operating budget has been spent on aviation-related economic development programs in the past five years? (Check One)**

- ❑ 0%
- ❑ 1 - 5%
- ❑ 6-10%
- ❑ 11 - 20%
- ❑ 21 - 35%
- ❑ 36% - 50%
- ❑ 51% - 75%
- ❑ More than 75%

9. **To what degree do you believe people in your community value aviation-related activity, which is located in your community? (Check One)**

- ❑ High
- ❑ Medium
- ❑ Low
- ❑ None

10. **To what degree is aviation a priority in your agency's economic development program? (Check One)**

- ❑ High
- ❑ Medium
- ❑ Low
- ❑ None

Go to question 13

11. **Which of the following describes aviation in your economic development program? (Check all relevant responses)**

- ❑ It helps market our community as a place to conduct business
- ❑ It helps market our community as a place to live
- ❑ Local businesses depend on air transportation
- ❑ People in the community depend on air transportation
- ❑ It provides employment in the community
- ❑ The role has not been clearly defined
- ❑ Others (Please specify) _____

12. **Indicate the type(s) of aviation economic development program(s) your agency has been involved with in the last five years, regardless of funding or outcome of the program(s). (Check all relevant responses)**

- ❑ Expanding an airport
- ❑ Establishing a new airport
- ❑ Encouraging use of the local airport
- ❑ Improving services at the local airport
- ❑ Establishing a Fixed-base Operator at the airport
- ❑ Establishing aviation education
- ❑ Establishing scheduled air service at the airport
- ❑ Encouraging aviation-related businesses to establish their firm(s) in the community
- ❑ Other (Please specify) _____

Go to question 14

13. **If you checked None in question 10, indicate why aviation-related economic development programs have not been a priority in your agency? (Check all relevant responses)**

- ❑ Aviation-related firms do not need our help
- ❑ Lack of funds
- ❑ Aviation is not a goal of our agency
- ❑ Low demand from the community
- ❑ Satisfied with current level
- ❑ Others (Please specify) _____

Go to question 15

14. **If your agency has been involved in aviation-related economic development program(s) in the past five years, indicate the percentage of aviation program(s) that has been highly, moderately, somewhat and not successful. (Complete all relevant responses)**

_____ % Highly successful
_____ % Moderately successful
_____ % Somewhat successful
_____ % Not successful

15. **How has aviation activity in your community changed over the past five years? (Check one)**

- ❑ Increased **Go to question 16**
- ❑ Not changed **Go to question 20**
- ❑ Decreased **Go to question 18**
- ❑ Don't know **Go to question 22**

16. **How has aviation activity Increased in your community over the past five years? (Check all relevant responses)**

- ❑ Scheduled air service has improved
- ❑ The quality of airport services have improved
- ❑ We have more transportation choices
- ❑ Others (Please specify) _____

17. **How has increased aviation activity impacted your community? (Check all relevant responses)**

- ❑ It has created jobs
- ❑ It has brought economic investment
- ❑ It has been a source of revenue **Go to question 22**
- ❑ Its has been a source of advertisement
- ❑ It is a source of community pride
- ❑ Others (Please specify) _____

18. **How has aviation activity decreased in your community over the past five years? (Check all relevant responses)**

- ❑ Scheduled air service has been reduced
- ❑ Scheduled air service has been terminated
- ❑ Business on the airport moved elsewhere
- ❑ Others (Please specify) _____
- ❑ Business on the airport closed
- ❑ The airport is in need of repair
- ❑ The airport closed

19. **How has decreased aviation activity impacted your community? (Check all relevant responses)**

- ❑ Jobs have been lost
- ❑ Businesses have moved out of the community
- ❑ The community lost a source of revenue **Go to question 22**
- ❑ The impact is difficult to measure
- ❑ There has been no impact
- ❑ Others (Please specify) _____

20. **Why has aviation activity not changed in your community over the past five years? (Check all relevant responses)**

- ❑ Slow economy
- ❑ Competition from other transportation sectors
- ❑ Others (Please specify) _____
- ❑ Decreasing population
- ❑ Changes in regulation

21. **How has <u>un-changed</u> aviation activity impacted your community? (Check all relevant responses)**

- ❑ Jobs have been lost
- ❑ Revenue from aviation has not increased
- ❑ There has been no impact
- ❑ Use of the airport has decreased
- ❑ The impact is difficult to measure
- ❑ Others (Please specify) _____

22. **Is your agency planning to <u>increase</u> economic development programs targeted toward aviation businesses or activities? (Check all relevant responses)**

- ❑ No
- ❑ Yes, within the next year
- ❑ Yes, within the next two to five years
- ❑ Yes, but not sure when
- ❑ Yes, within the next two years
- ❑ Other (Please specify) _____

23. **If a research center was established to assist you in developing or improving your economic programs targeted toward aviation-related business or activity, what benefits would you expect from such a center? (Check all relevant responses)**

- ❑ Assist in acquiring funding for aviation-related economic development programs
- ❑ Assist in developing proposals
- ❑ Assist in promoting our community airport
- ❑ Assist in bringing aviation businesses to our community
- ❑ Assist in bringing scheduled air service to our community
- ❑ Other (Please specify) _____

24. **A survey cannot cover everything that is important to you. Please use this space for comments you would like to make about topics in this survey.**

_____

_____

_____

_____

_____

If you would like to receive results of this survey, please complete the following:

First Name _____ **Last Name** _____ **Middle** _____

Agency's Name _____ **Title** _____

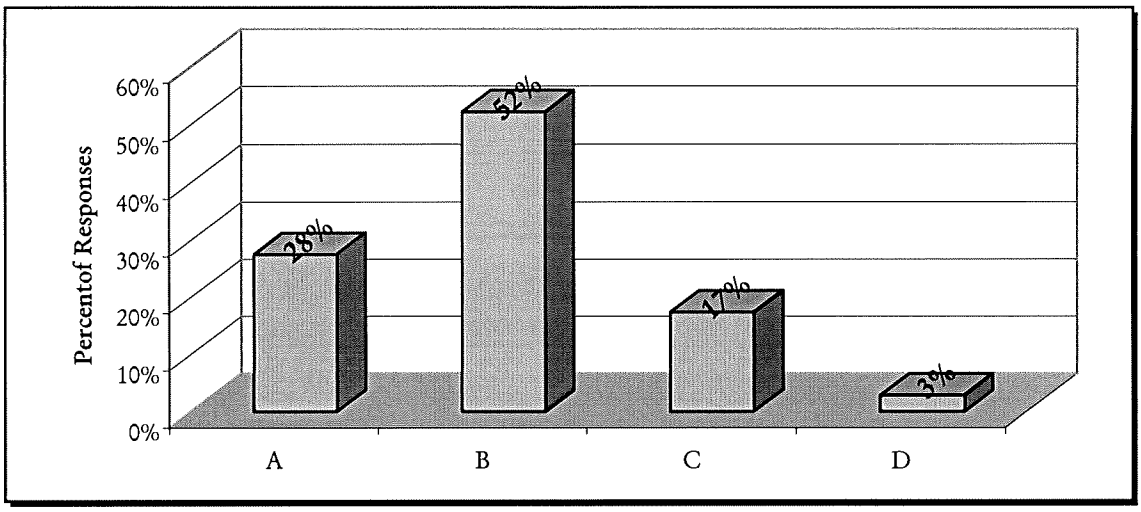
Address _____

City _____ **State** _____ **Zip Code** _____

APPENDIX B

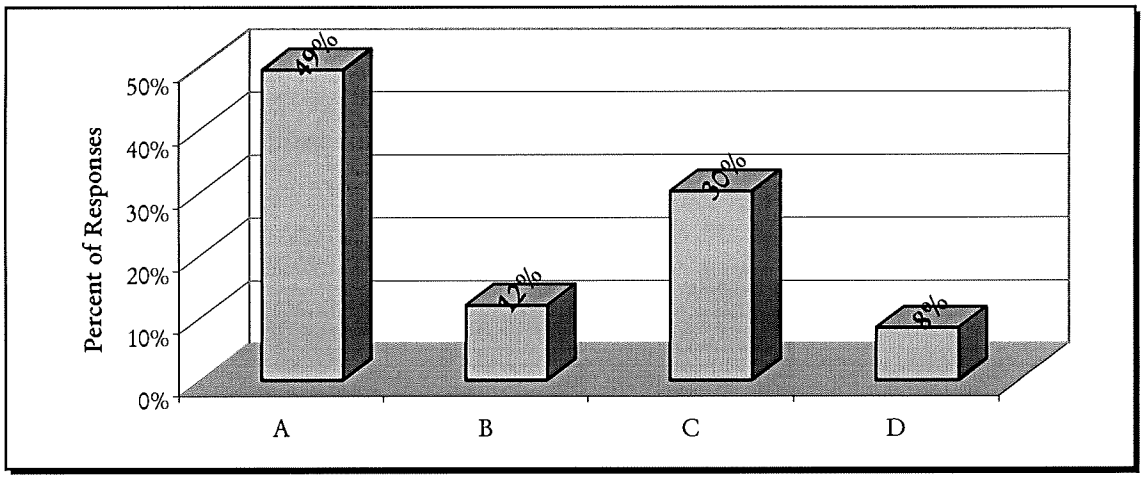
1. To what degree do you believe people in your community support economic development?

A High B Medium C Low D None



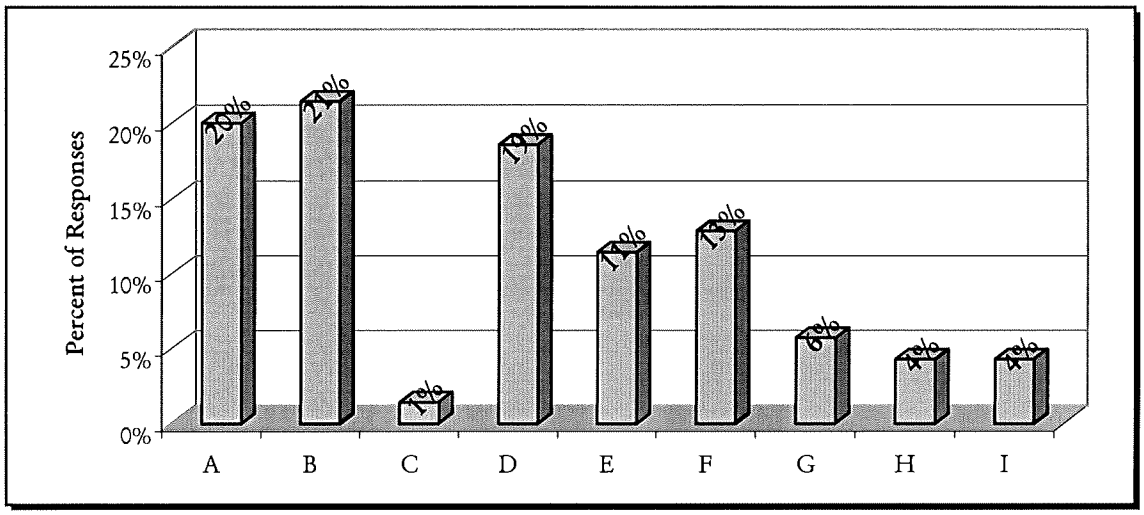
2. What is the geographic scope of your agency's economic development program?

A City B Multi-City C County D Multi-County



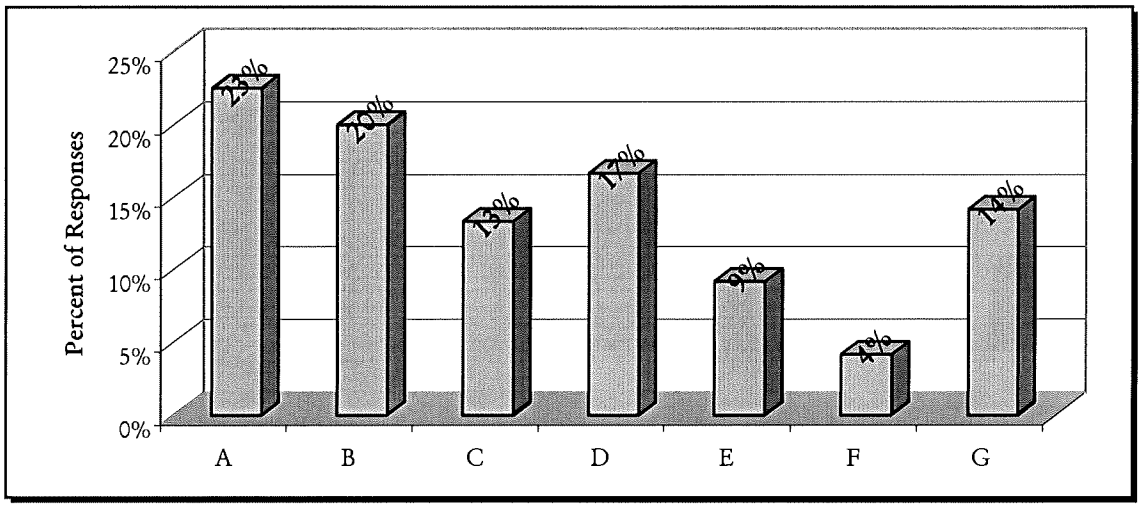
3. What is your agency's average annual operating budget for the past five years?

A $0
B $100 - $5000
C $5,000 - $10,000
D $10,000 - $25,000
E $25,000 - 50,0000
F $50,000 - $100,000
G $100,000 - $250,000
H $250,000 - 500,000
I More than $500,000



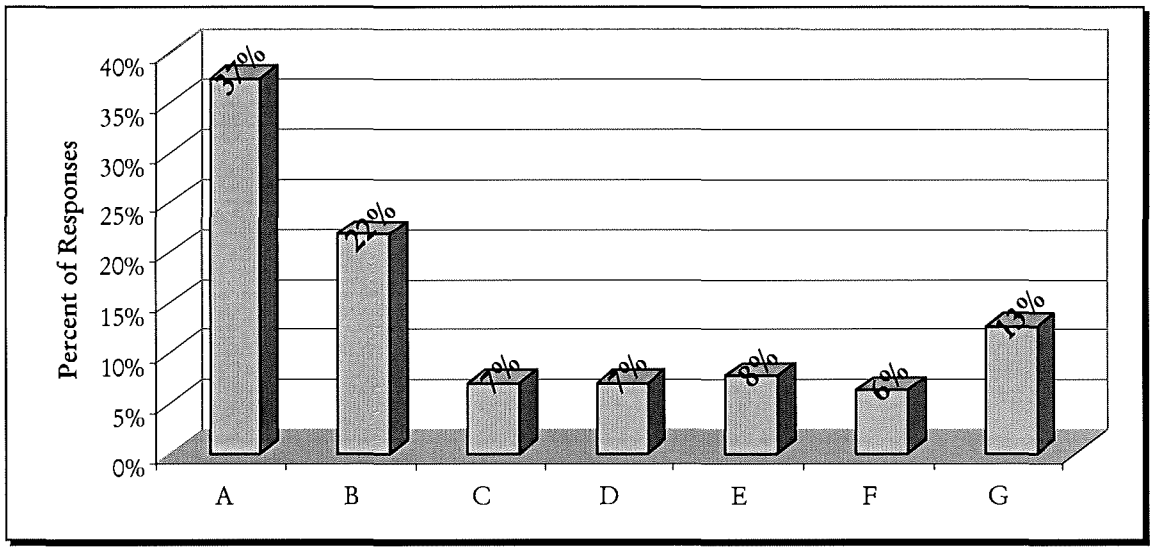
4. What is (are) the source(s) of funding for your agency?

A Mill levy funds
B Private donations
C Business contributions
D City appropriated funds
E County appropriated funds
F State appropriated funds
G Others



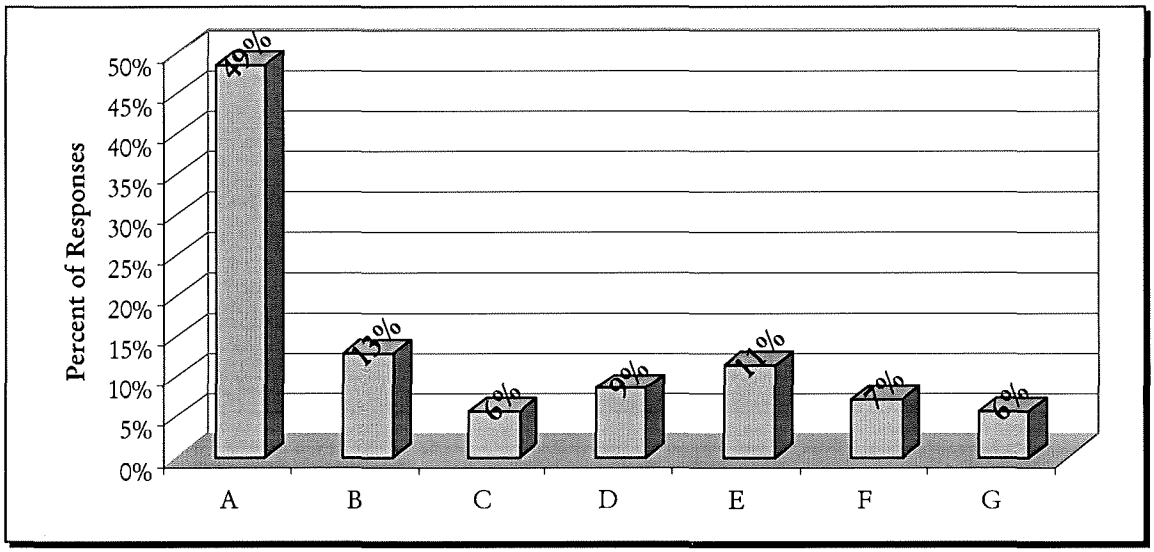
5. **What types of aviation activity are located in your community?**

A Aerial Crop Spraying
B General Aviation
C Air Medical Service
D Scheduled Air Service
E Aviation Education
F Aircraft Manufacturing
G None



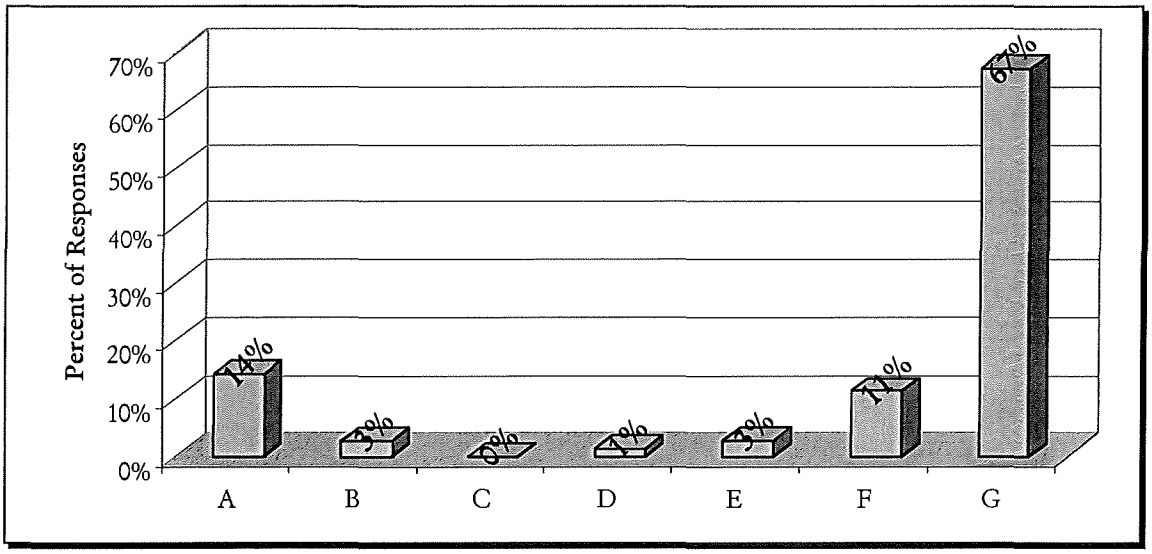
6. **What is the distance between the center of your community and the closest public-use airport <u>without</u> scheduled air service?**

A 1-5 miles
B 6-10 miles
C 11-15 miles
D 16-20 miles
E 21-30 miles
F 31-40 miles
G More than 40 miles



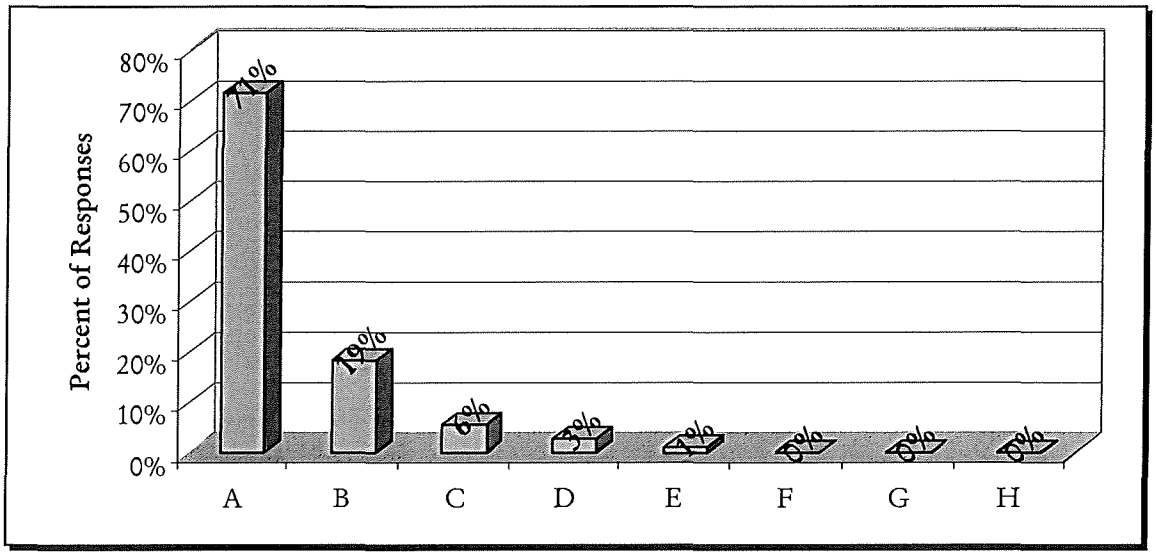
7. What is the distance between the center of your community and the closest public-use airport <u>with</u> scheduled air service ?

A 1-5 miles
B 6-10 miles
C 11-15 miles
D 16-20 miles
E 21-30 miles
F 31-40 miles
G More than 40 miles



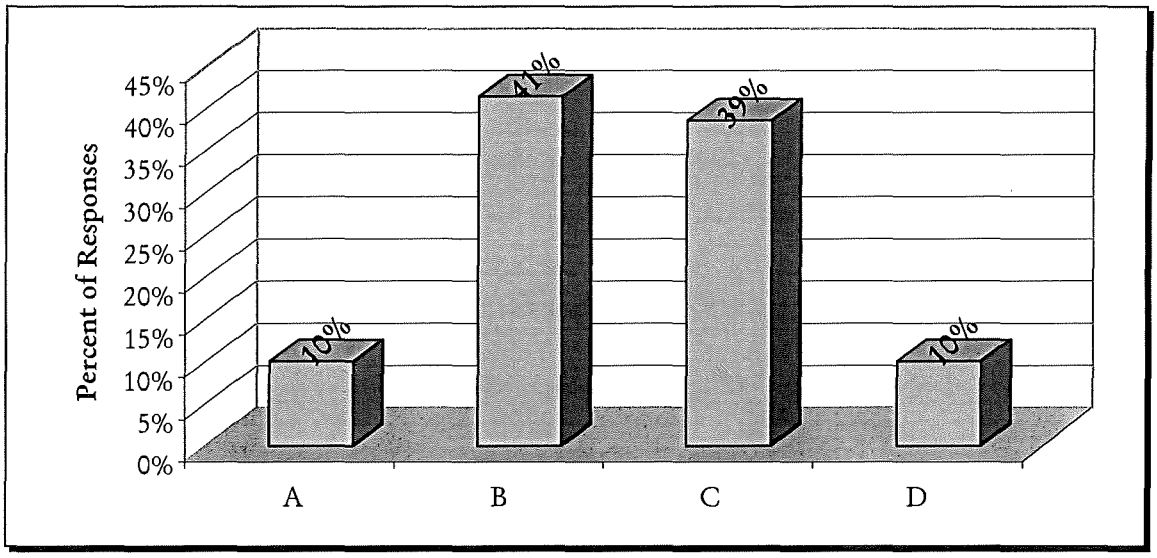
8. What percentage of your agency's annual operating budget has been spent on aviation-related economic development programs in the past <u>five</u> years?

A 0%
B 1 - 5%
C 6-10%
D 11 - 20%
E 21 - 35%
F 36% - 50%
G 51% - 75%
H More than 75%



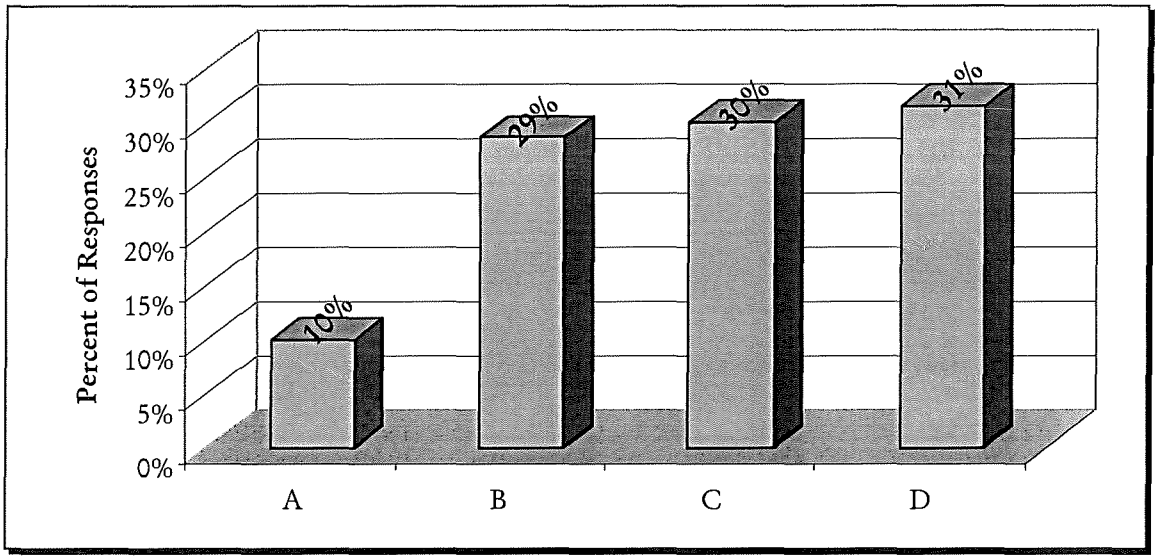
9. To what degree do you believe people in your community value aviation-related activity that is located in your community?

A High B Medium C Low D None

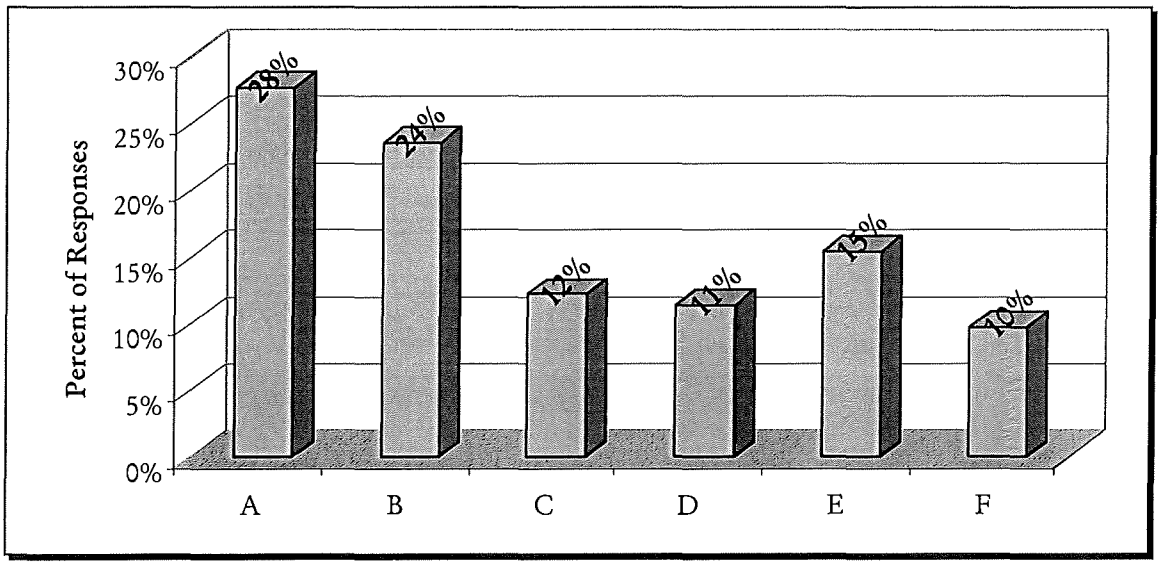


10. To what degree is aviation a priority in your agency's economic development program?

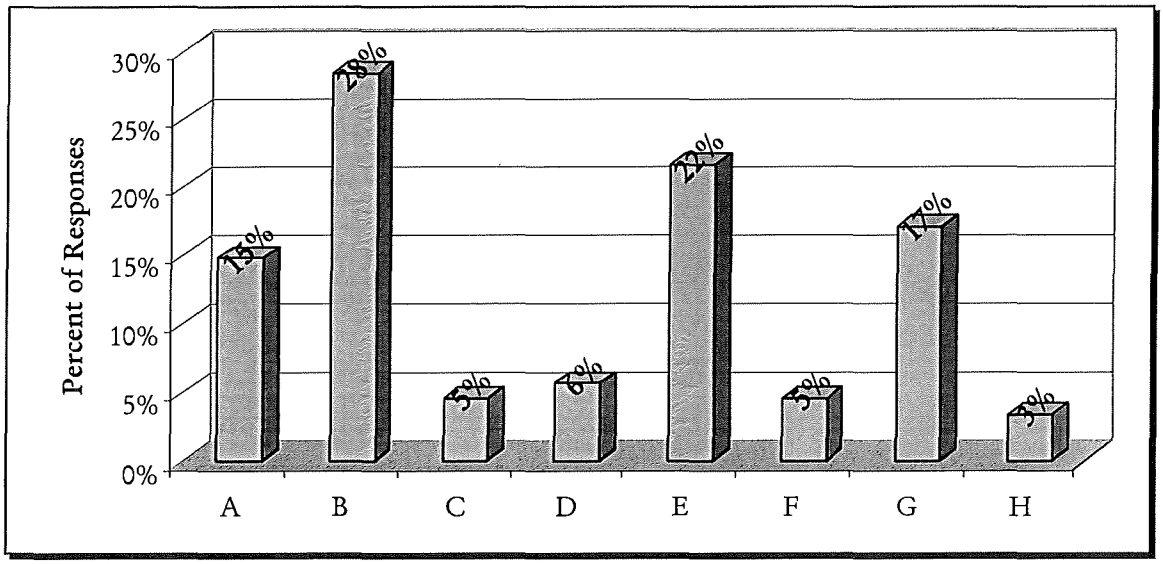
A High B Medium C Low D None



11. **Which of the following describes aviation in your economic development program?**
    - A It helps market our community as a place to conduct business
    - B It helps market our community as a place to live
    - C Local businesses depend on air transportation
    - D People in the community depend on air transportation
    - E It provides employment in the community
    - F The role has not been clearly defined

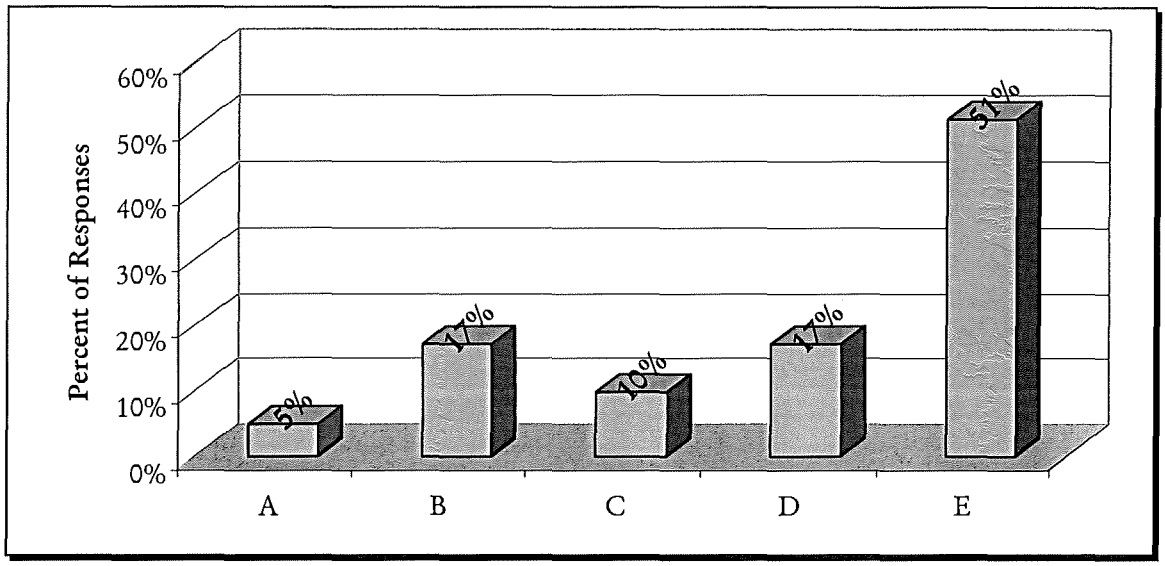


12. **Indicate the type(s) of aviation economic development program(s) your agency has been involved with in the last five years, <u>regardless of funding or outcome</u> of the program(s).**
    - A Expanding an airport
    - B Encouraging use of the local airport
    - C Establishing a Fixed-base Operator at the airport
    - D Establishing scheduled air service at the airport
    - E Encouraging aviation-related businesses to establish their firm(s) in the community
    - F Establishing a new airport
    - G Improving services at the local airport
    - H Establishing aviation education

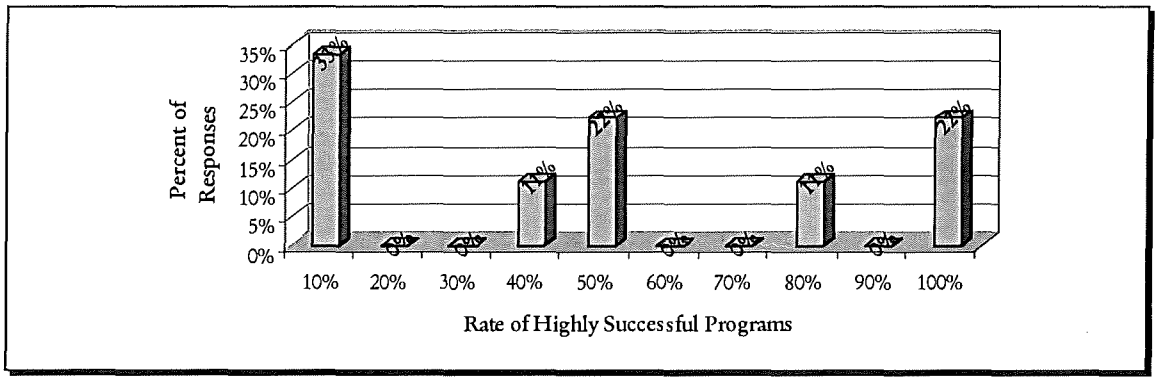


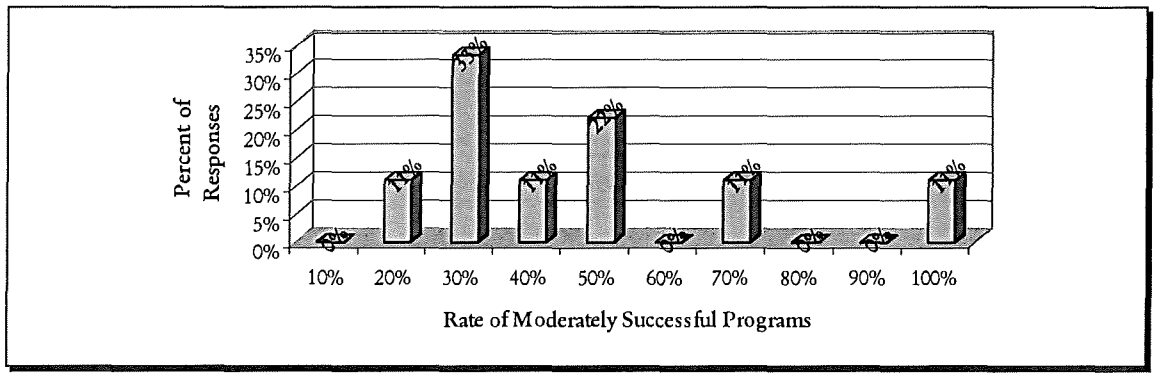
13. If you checked <u>None</u> in question ten, indicate why aviation-related economic development programs have not been a priority in your agency?

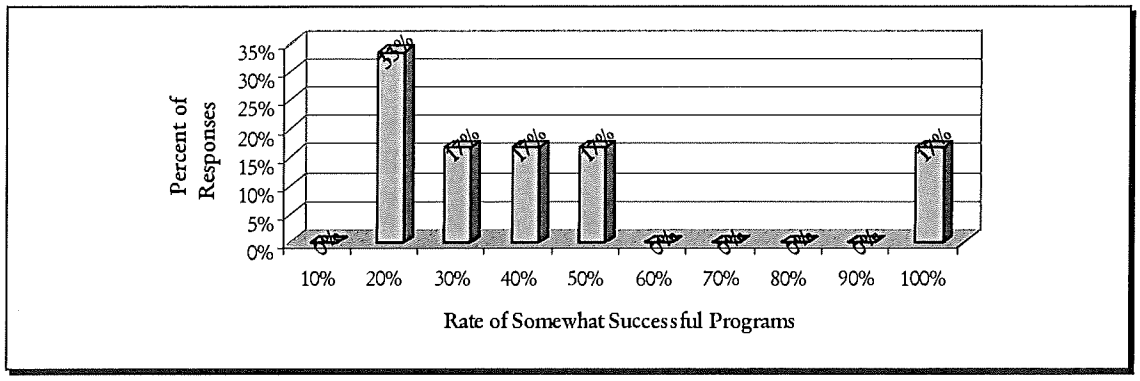
A Aviation-related firms do not need our help
B Aviation is not a goal of our agency
C Satisfied with current level
D Lack of funds
E Low demand from the community

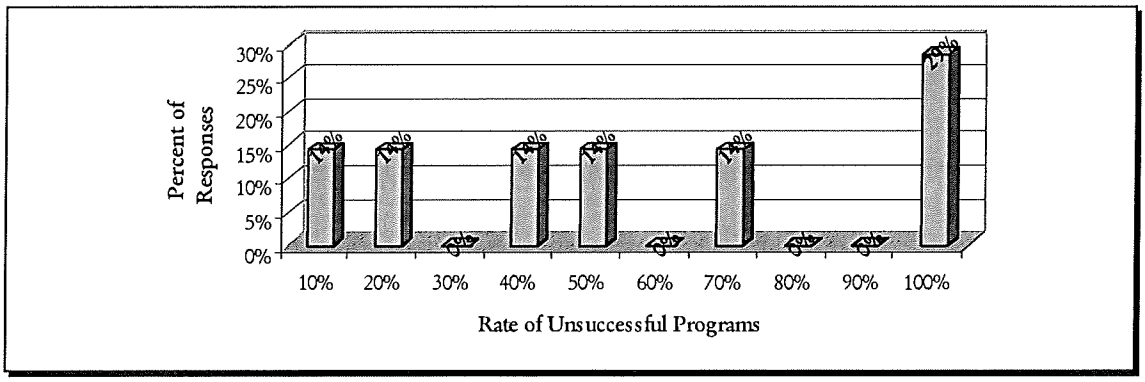


14. If your agency <u>has been</u> involved in aviation-related economic development program(s) in the past five years, indicate the percentage of aviation program(s) that has been highly, moderately, somewhat and not successful.

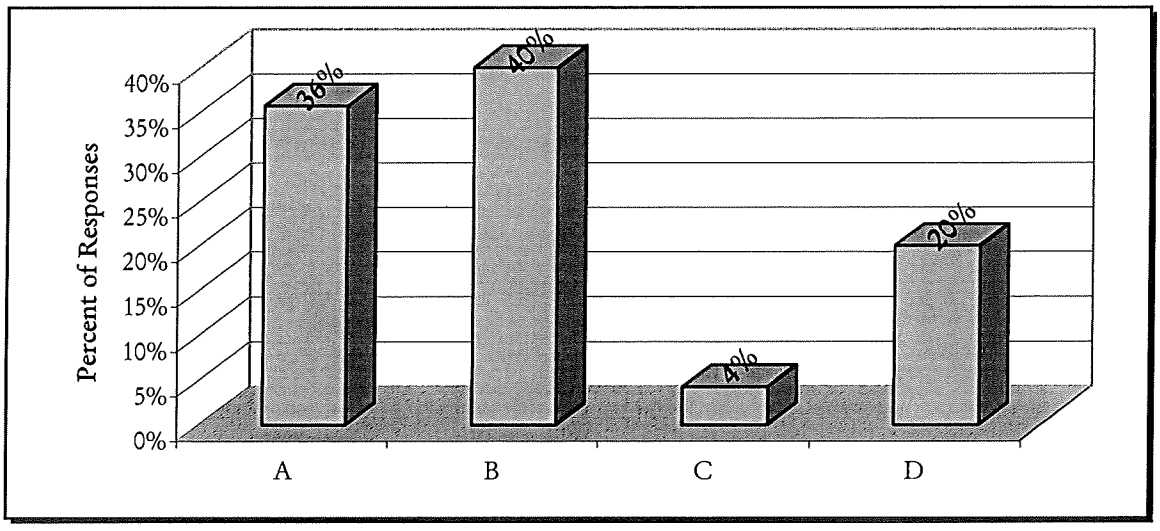






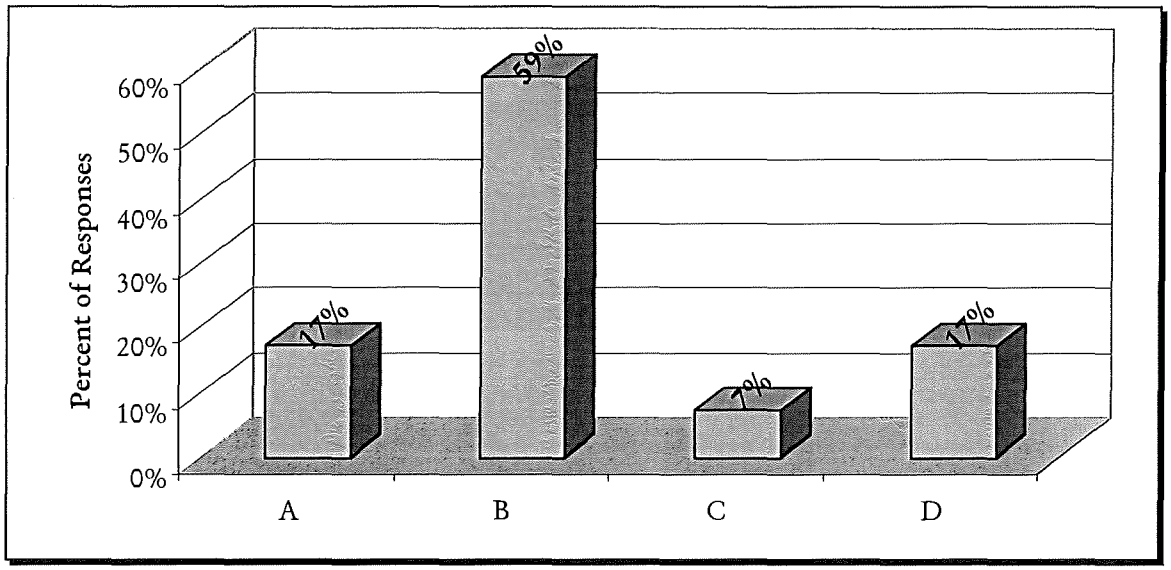


15. How has aviation activity in your community changed over the past five years?
A Increased B Not Changed C Decreased D Don't Know



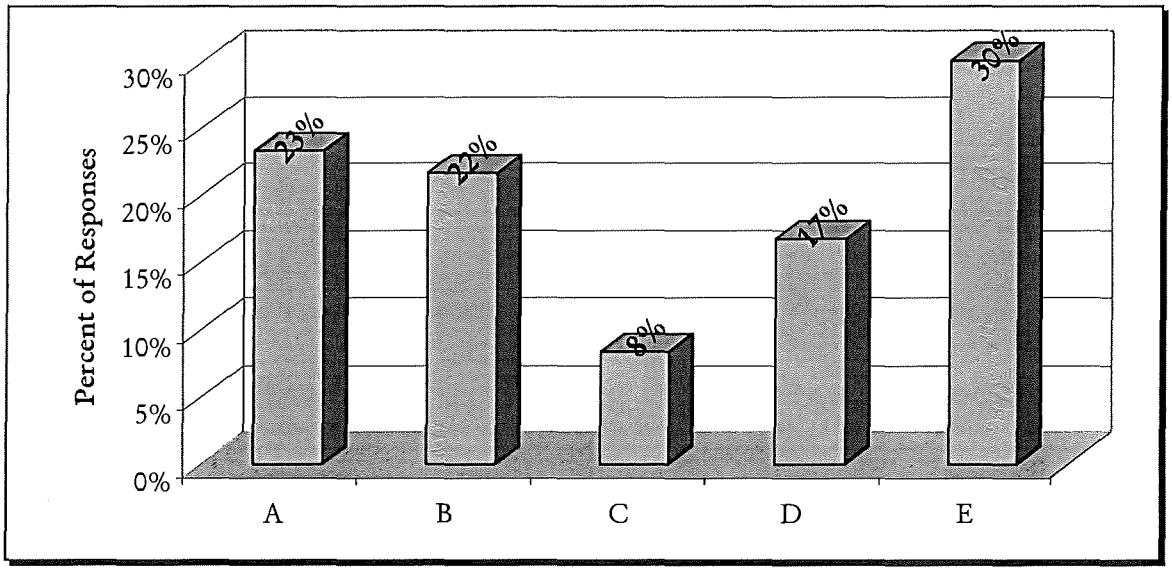
16. **How has aviation activity <u>Increased</u> in your community over the past five years?**

A Scheduled air service has improved
B The quality of airport services have improved
C We have more transportation choices
D Others



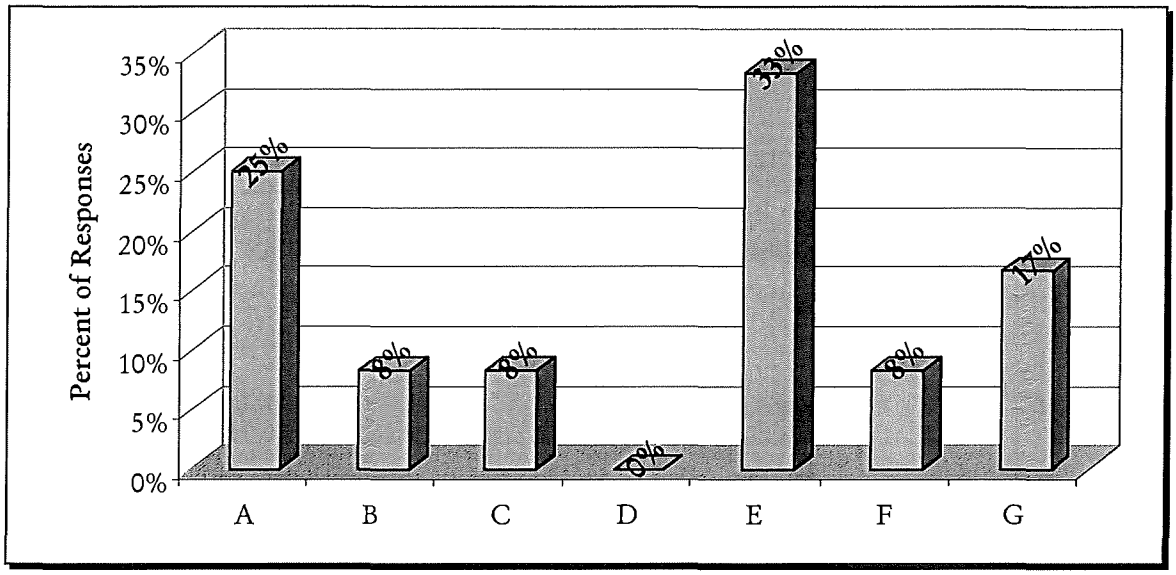
17. **How has <u>increased</u> aviation activity impacted your community?**

A It has created jobs
B It has brought economic investment
C It has been a source of revenue
D Its has been a source of advertisement
E It is a source of community pride



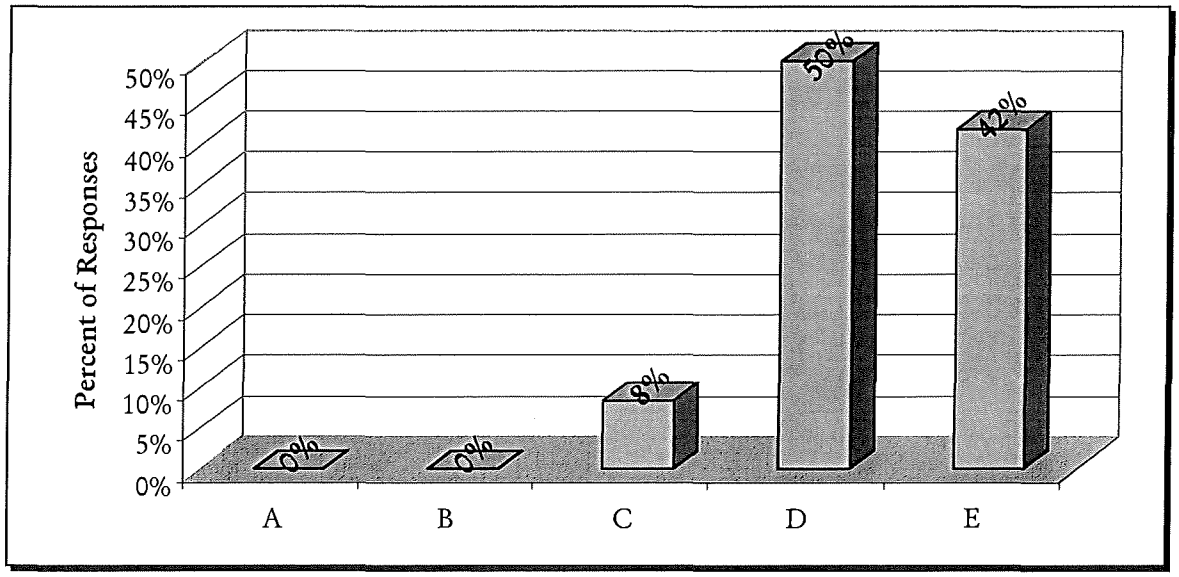
18. How has aviation activity <u>decreased</u> in your community over the past five years?

A Scheduled air service has been reduced
B Scheduled air service has been terminated
C Business on the airport moved elsewhere
D Business on the airport closed
E The airport is in need of repair
F The airport closed
G Others



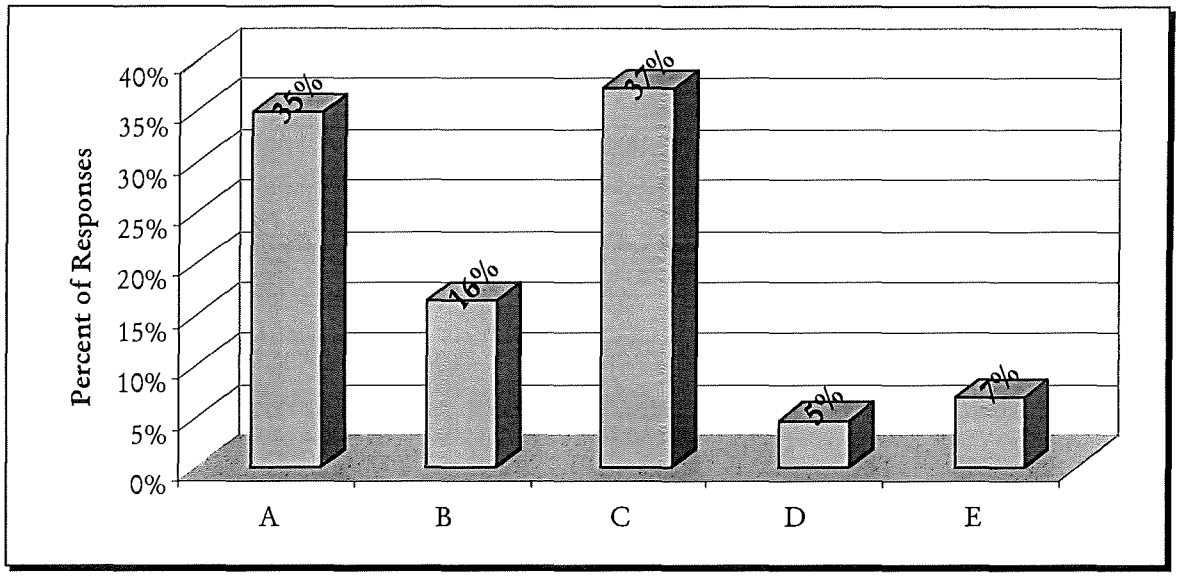
19. How has <u>decreased</u> aviation activity impacted your community?

A Jobs have been lost
B Businesses have moved out of the community
C The community lost a source of revenue
D The impact is difficult to measure
E There has been no impact



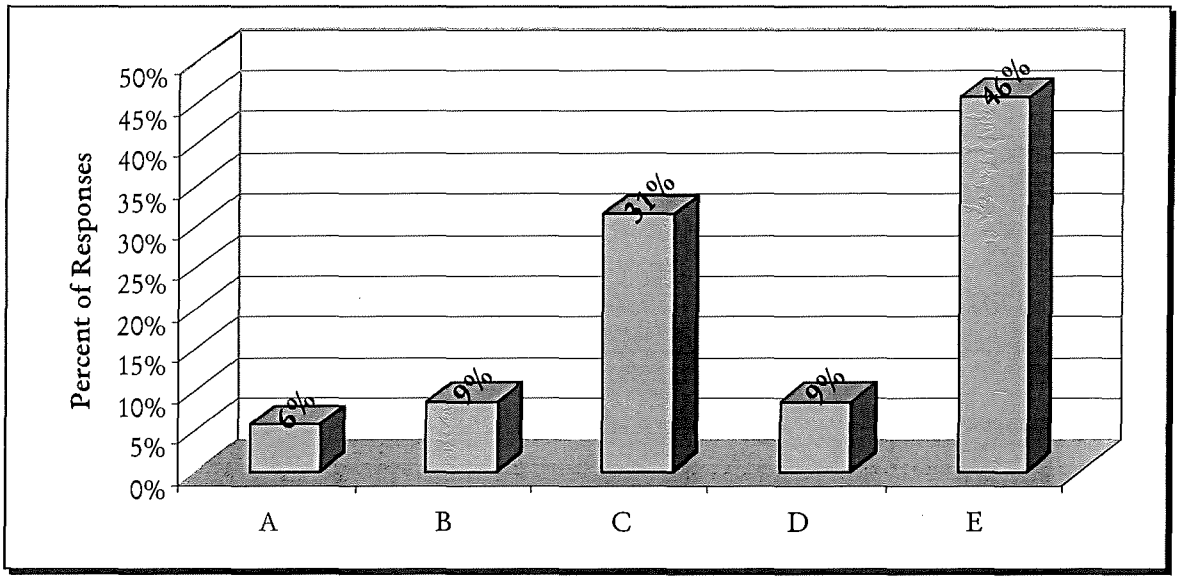
20. Why has aviation activity <u>not changed</u> in your community over the past five years?

A Slow economy
B Competition from other transportation sectors
C Decreasing population
D Changes in regulation
E Others



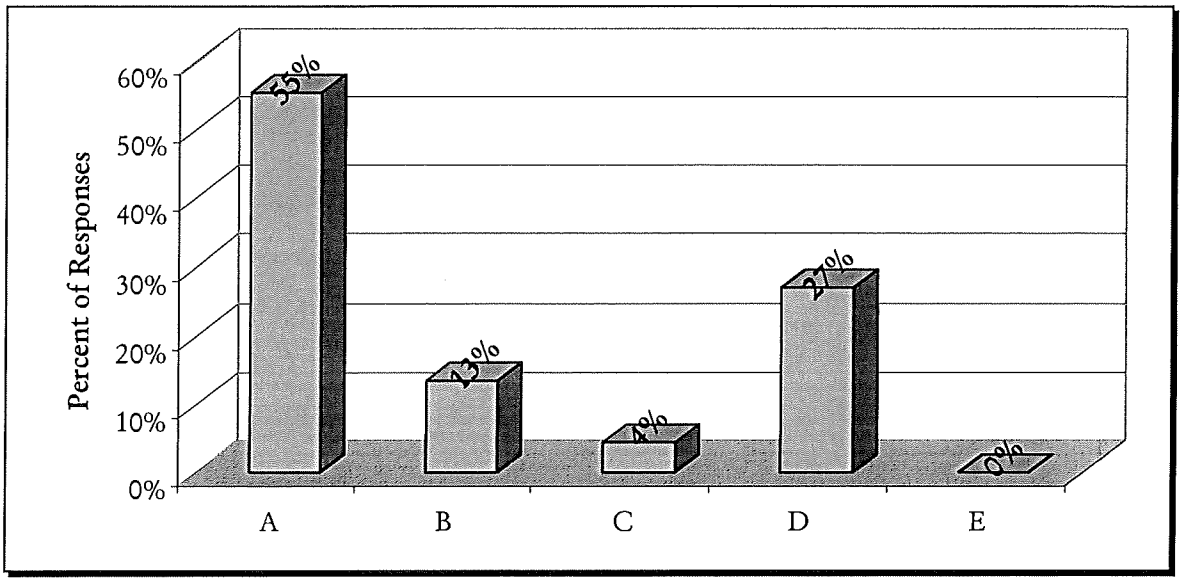
21. How has <u>un-changed</u> aviation activity impacted your community?

A Jobs have been lost
B Revenue from aviation has not increased
C There has been no impact
D Use of the airport has decreased
E The impact is difficult to measure



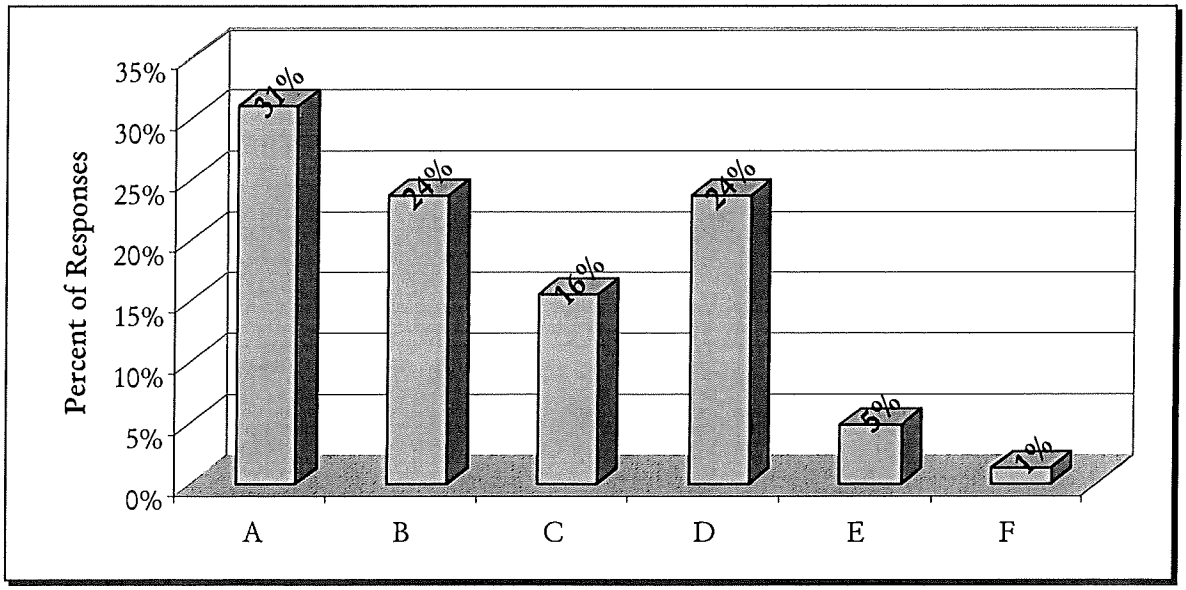
22. **Is your agency planning to <u>increase</u> economic development programs targeted towards aviation businesses or activities?**

A No
B Yes, within the next year
C Yes, within the next 2 to 5 years
D Yes, but not sure when
E Yes, within the next two years



23. **If a research center were established to assist you in developing or improving your economic programs targeted towards aviation-related business or activity, what benefits would you expect from such a center?**

A Assist in acquiring funding for aviation-related economic development programs
B Assist in developing proposals
C Assist in promoting our community airport
D Assist in bringing aviation businesses to our community
E Assist in bringing scheduled air service to our community
F Other



APPENDIX C

	INPUT-OUTPUT COEFFICIENTS FOR NORTH DAKOTA										
	Sector	1	2	3	4	5	6	7	8	9	
1	Ag. Livestock	1.21	0.08	0.04	0.03	0.05	0.04	0.19	0.09	0.06	
2	Ag. Crops	0.39	1.09	0.02	0.01	0.02	0.02	0.65	0.03	0.04	
3	Nonmetallic Mining	0.01	0.01	1.04	0.03	0.01	0.00	0.01	0.00	0.00	
4	Construction	0.07	0.08	0.05	1.05	0.05	0.07	0.06	0.03	0.07	
5	Transportation	0.02	0.01	0.03	0.01	1.01	0.01	0.01	0.01	0.01	
6	Comm. And Public Util.	0.09	0.08	0.16	0.06	0.08	1.10	0.08	0.05	0.13	
7	Ag. Proc. & Misc. Mfg.	0.57	0.16	0.03	0.02	0.03	0.02	1.74	0.05	0.07	
8	Retail Trade	0.71	0.81	0.52	0.41	0.55	0.43	0.61	1.27	0.68	
9	Fin. Ins. Real Estate	0.15	0.17	0.11	0.08	0.12	0.11	0.13	0.06	1.14	
10	Bus. & Per. Services	0.06	0.07	0.04	0.03	0.05	0.04	0.05	0.02	0.08	
11	Prof & Soc. Services	0.07	0.06	0.06	0.04	0.05	0.05	0.05	0.03	0.08	
12	Households	1.05	0.96	0.84	0.61	0.79	0.80	0.79	0.40	1.20	
13	Government	0.10	0.10	0.09	0.05	0.26	0.10	0.08	0.04	0.11	
14	Coal Mining	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
15	Thermal-Elec Generation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
16	Per Exp/Ext.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
17	Per Refining	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Gross Receipts Multiplier	4.49	3.69	3.03	2.44	3.05	2.79	4.45	2.09	3.68	

	Sector	10	11	12	13	14	15	16	17		
1	Ag. Livestock	0.04	0.06	0.07	0.00	0.04	0.03	0.02	0.00		
2	Ag. Crops	0.02	0.02	0.03	0.00	0.03	0.03	0.01	0.00		
3	Nonmetallic Mining	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00		
4	Construction	0.05	0.08	0.09	0.00	0.05	0.03	0.11	0.02		
5	Transportation	0.01	0.01	0.01	0.00	0.01	0.00	0.02	0.01		
6	Comm. And Public Util.	0.11	0.12	0.11	0.00	0.07	0.04	0.05	0.01		
7	Ag. Proc. & Misc. Mfg.	0.02	0.04	0.04	0.00	0.06	0.08	0.01	0.00		
8	Retail Trade	0.45	0.67	0.74	0.00	0.40	0.23	0.18	0.05		
9	Fin. Ins. Real Estate	0.11	0.14	0.17	0.00	0.08	0.10	0.04	0.01		
10	Bus. & Per. Services	1.05	0.05	0.06	0.00	0.03	0.02	0.01	0.00		
11	Prof & Soc. Services	0.05	1.10	0.10	0.00	0.05	0.03	0.02	0.01		
12	Households	0.72	1.04	1.55	0.00	0.66	0.40	0.32	0.08		
13	Government	0.08	0.09	0.11	1.00	0.05	0.04	0.03	0.01		
14	Coal Mining	0.00	0.00	0.00	0.00	1.00	0.16	0.00	0.00		
15	Thermal-Elec Generation	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00		
16	Per Exp/Ext.	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.10		
17	Per Refining	0.00	0.00	0.00	0.00	0.02	0.01	0.00	1.00		
	Gross Receipts Multiplier	2.71	3.42	3.08	1.00	2.55	2.19	1.92	1.29		