

How Important Is Airport Access for Rural Businesses?

Fred Gale
Dennis Brown

Air transportation is becoming essential to American businesses as they strive for greater efficiency and more timely order fulfillment. Air shipment of parts, components, and finished products facilitates increasingly popular “just-in-time” inventory management and flexible, or “lean,” manufacturing. Customers increasingly expect next-day delivery of orders. Advanced technology and equipment—as well as outsourcing of business services—necessitate frequent trips by vendors, consultants, or headquarters personnel, often by air. Thus, poor access to air transportation can handicap many rural communities hoping to attract and retain cutting-edge businesses.

Deregulation in 1978 lifted fare limits and eliminated minimum service requirements for air service in small communities. While deregulation led to generally lower fares and increased air traffic, air carriers cut flights to smaller communities as they concentrated operations around larger hub airports. This led to relatively high fares, infrequent

Poor access to air service is a concern for many rural communities, as evidenced by a nationwide sample of manufacturing businesses. Manufacturers in the most rural areas are more likely than others to say that airport access is affecting their ability to compete. Inadequate airport access is one of the top five problems with location cited by manufacturers in the most rural counties. The use of outside technical expertise and location in the West South Central region also increased the probability of citing access problems.

departures, and use of propeller-driven commuter planes (instead of jet aircraft) for low-volume routes to smaller communities.

Congress established the Essential Air Service Program as part of the 1978 Airline Deregulation Act to ensure that small communities would not lose air service (although it provided no assistance for places without air service that wanted to acquire it). Under this program, the Department of Transportation determines the minimum level of service needed in each eligible community and, where necessary, subsidizes a carrier to ensure adequate service. In 1998, the program received a substantial increase, boosting annual funding to \$50 million. Most benefits go to a few rural communities mostly in the Midwest, Rocky Mountain States, and Alaska.

Concerns about air service for small communities still surface in government reports and the media. States, local governments, and private groups have all undertaken ini-

tiatives to improve or expand service. Decisions about airport construction and improvements also frequently acknowledge the effect of airport access on economic development.

Most Nonmetro Counties Lack Access to Major Airports

The facilities at smaller “general aviation” airports are often inadequate for business needs. For example, a small airport may lack lights and instrument capabilities to facilitate night and all-weather takeoffs and landings. In addition, runways are often too short for jet traffic.

Major hub airports that carry most air passengers are generally located in or near cities, which limits access to rural businesses. There are only 30 “large hub” airports, which account for most passenger traffic, and all are located in large metropolitan areas (see “Federal Aviation Administration Airport Classification,” p. 24). In addition, all 38 medium hub and 73 small hub airports are in metro areas.

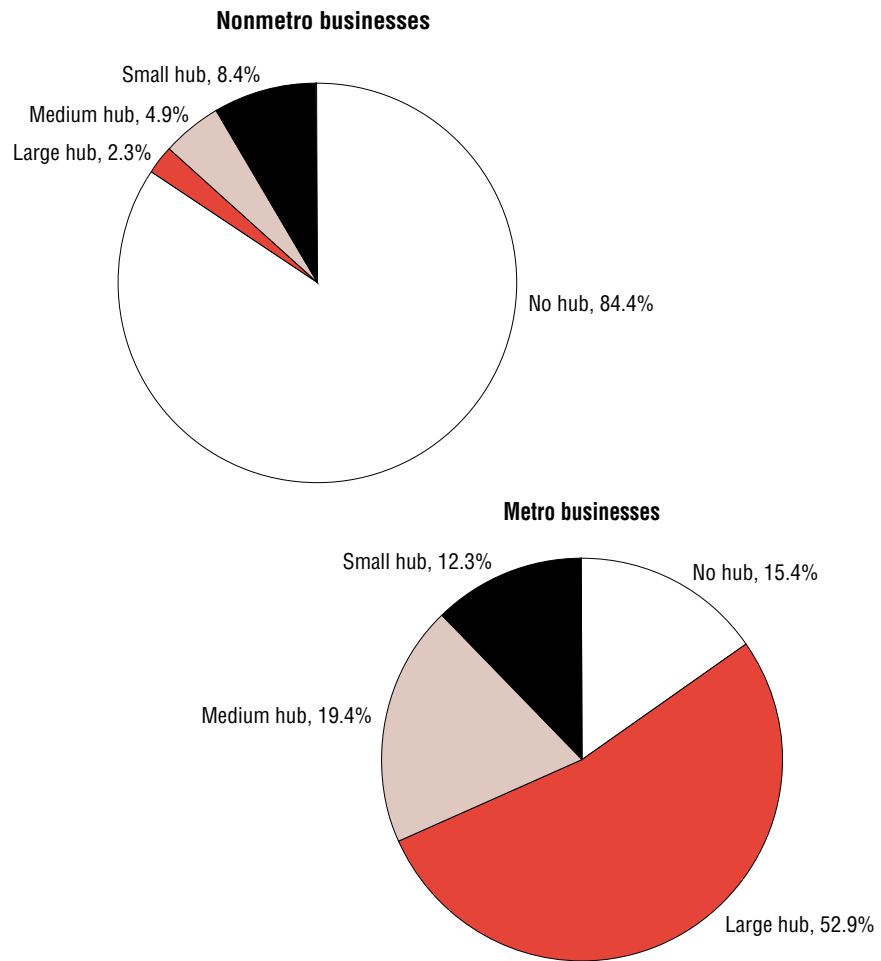
Fred Gale is an economist and Dennis Brown is a regional economist in the Rural Business and Development Policy Branch, Food and Rural Economics Division, ERS.

Over 1,900 nonmetro counties (of nearly 2,300 total) are not within easy commuting distance of a major airport. We identified the largest type of airport contained in each of 740 “commuting zones” (contiguous groupings of counties based on workforce commuting patterns). Forty-three nonmetro counties are in commuting zones that contain a large hub airport, 87 are in zones with a medium hub, and 180 are in zones with a small hub. That leaves over 1,900 nonmetro counties that do not have a hub airport within their commuting zone. Nearly all of those counties do contain smaller nonhub, nonprimary, or general aviation airports, but these smaller airports are generally served by fewer, if any, commercial carriers. They have fewer direct flights and fares are often higher.

Does Limited Airport Access Hamper Rural Businesses?

Most studies of business location choices do not place airport access among the most important factors influencing location decisions (Reeder and Wanek). However, business and community leaders often cite lack of convenient, affordable air service as a disadvantage of rural business locations. For example, an economic development official in Casper, Wyoming, was quoted as saying, “We have...looked at the companies that considered Casper, and air service is always one of the top issues” (Frank Swoboda, “Stranded by Airline Deregulation,” *Washington Post*, Jan. 2, 1999, p. F1). While air service may not be the primary consideration in most business location decisions, it can tip the balance when other factors are equal. Air service is particularly important for attracting manage-

Figure 1
Metro and nonmetro businesses, by size of local airport, 1996
Most nonmetro businesses are in commuting zones without a hub airport



Note: "Hub" airports are defined by the Federal Aviation Administration. "Large hub" airports account for at least 1 percent of national enplanements, "medium hub" airports account for 0.24 - 0.99 percent, and "small hub" airports account for 0.05 - 0.24 percent.

Source: Calculated by ERS from 1996 County Business Patterns and Federal Aviation Administration data.

ment jobs and high-tech and business service industries.

In 1996, 84 percent of nonmetro business establishments were located in commuting zones without hub airports (fig. 1). By comparison, only 15 percent of metro businesses were in commuting zones without a hub airport, and more than half of metro businesses were in commuting zones with a large hub. However, despite limited access to airports, nonmetro

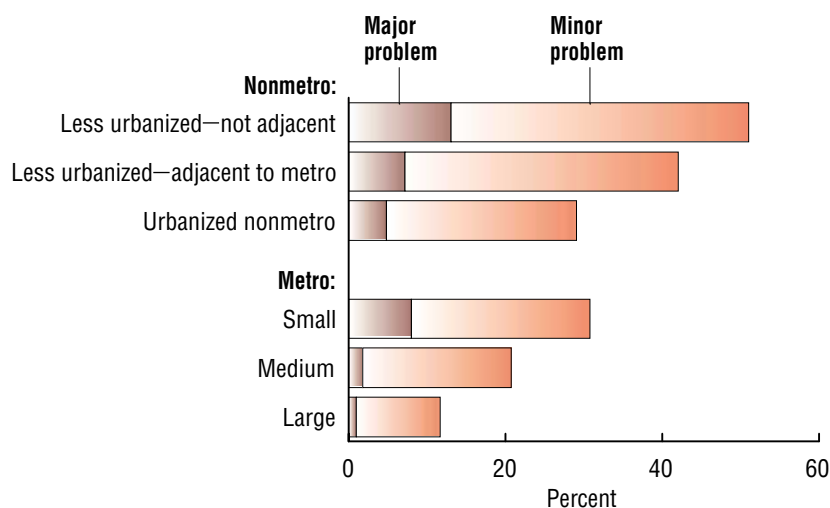
businesses in nonhub commuting zones created jobs at the same rate as nonmetro businesses in commuting zones with hub airports. Between 1991 and 1996, nonmetro employment grew by the same rate (about 17 percent) in commuting zones with and without hub airports.

A 1996 survey of rural manufacturing businesses asked owners and managers to evaluate the importance of access to airports

Figure 2

Problems with airport access reported by nonmetro and metro manufacturers, 1996

Problems were reported most frequently by businesses in rural locations



Note: Chart shows percentage of establishments that said "access to airport facilities and services" was a major or minor problem affecting their ability to compete. "Less urbanized" are nonmetro counties with an urban population of less than 10,000. "Urbanized nonmetro" counties have urban population of 10,000 or more and are outside metro areas. "Small metro" areas have population less than 100,000. "Medium metro" areas have population of 100,000 to 999,999. "Large metro" areas have population of 1 million or more.

Source: Calculated by ERS from Rural Manufacturing Survey data, weighted for stratification.

and air service (see "Rural Manufacturing Survey"). Nine percent of manufacturers cited airport access as a major problem affecting business competitiveness, and 35 percent said it was a minor problem. The number of respondents indicating airport access as a major problem statistically represents 3,300 U.S. manufacturing establishments employing 460,000 workers, which would amount to 11.5 percent of all nonmetro manufacturing jobs in 1996. Thus, while the survey indicates that most rural manufacturing businesses do not view airport access as a problem, a significant minority does.

As might be expected, manufacturers in the most rural places reported airport access problems most frequently. In the most rural counties (urban populations under

10,000 and not adjacent to a metro county), 13 percent of manufacturers said airport access was a major problem, and half reported it as at least a minor problem (fig. 2). Of 21 potential barriers to competitiveness associated with their location, airport access was the fifth most frequently cited major problem—behind local labor quality, environmental regulations, State and local taxes, and attractiveness of the area to managers and professionals—by manufacturers in the most rural counties. Airport access was the ninth most frequently cited major problem by manufacturers in urbanized and less urbanized nonmetro counties adjacent to a metro area. Airport access was also one of the top five barriers cited as a minor problem in each type of nonmetro county. Nonmetro manu-

facturers reported problems with airport access more often than they reported problems with other modes of transportation (access to highways, railroads, and local roads and bridges).

Airport access problems were also frequently reported in small metro areas (population less than 100,000)—8 percent said it was a major problem and 23 percent said it was a minor problem. However, in medium and large metro areas, only 1 percent cited airport access as a major problem, ranking 20th and 21st as potential barriers to competitiveness.

Problems Were Reported in All Regions

Airport access is usually considered a problem primarily in remote areas of the Great Plains and Mountain regions. A 1997 study found that airports in small and medium-sized communities of the East and Upper Midwest had experienced declines in quality and quantity of air service, while large communities in the West and Southwest had experienced increased service and lower fares (U.S. General Accounting Office, 1997). The report attributed regional differences to increased airline entry and competition in areas where economic growth was more rapid.

Nonmetro manufacturers reported airport access problems in every region of the country (fig. 3), with those in the West South Central region (Arkansas, Louisiana, Oklahoma, Texas) most likely to report a major problem (13.5 percent). Two other sparsely populated regions—the West North Central (Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas) and Mountain (Montana, Idaho, Wyoming, Colorado, New

Mexico, Arizona, Utah, Nevada)—were among the most likely to report a major problem (about 10 percent). However, Mountain manufacturers reported minor problems relatively infrequently. East South Central (Kentucky, Tennessee, Alabama, Mississippi) establishments were the most likely to report a minor problem with airport access. As expected, problems were reported least often in the more densely settled Pacific and New England regions.

We also compared the frequency of airport access problems in commuting zones with and without hub airports (fig. 4). Nonmetro manufacturers in commuting zones without a hub airport reported a major problem with airport access

at twice the rate (9.6 percent versus 4.1 percent) of those in commuting zones with a hub airport.

Manufacturers in commuting zones without a hub airport were also more likely to report airport access as a minor problem.

Rural Access Still Worse After Accounting for Business Characteristics

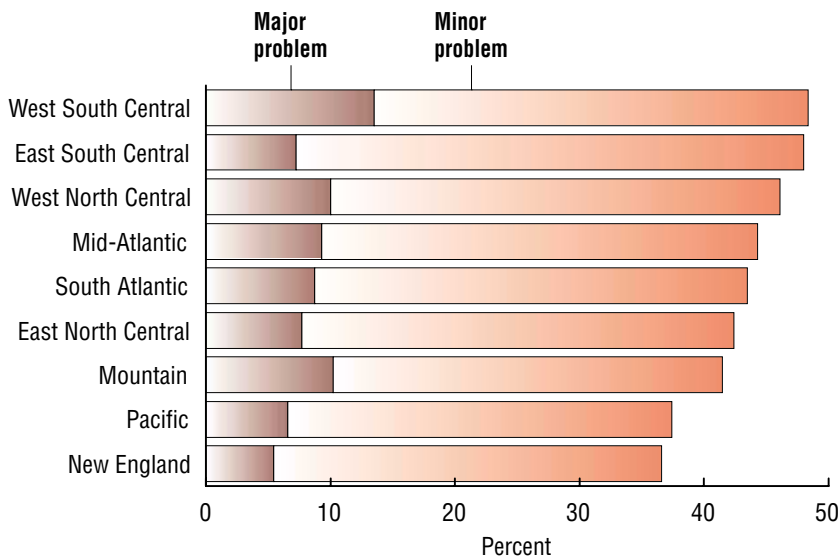
Air service is more critical to some types of firms than it is to others. For example, previous studies have asserted that establishments that are part of larger companies, those that do more business outside of their local area, and those that employ more highly skilled workers are more reliant on air travel. It is important to know

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We estimated a multivariate statistical model using the Rural Manufacturing Survey to investigate how reported airport access problems are related to business and location characteristics of nonmetro manufacturers. A multivariate model allows us to estimate how each characteristic affects the probability that a business reports problems with airport access, while holding other characteristics constant. We hypothesized that the likelihood of an establishment reporting a major or minor problem with airport access depends on its size, the type of plant (headquarters, branch, or single-unit establishment), whether a major expansion or modernization was recently undertaken, whether the plant uses just-in-time production management, the percentage of employees who are managers and professionals, the number of telecommunications technologies used in the plant, and the percentage of business done outside the local region. We also included measures of the “ruralness” of the establishment’s

Figure 3
Nonmetro manufacturers' airport access, by region, 1996
Manufacturers in the West South Central region were most likely to report airport problems

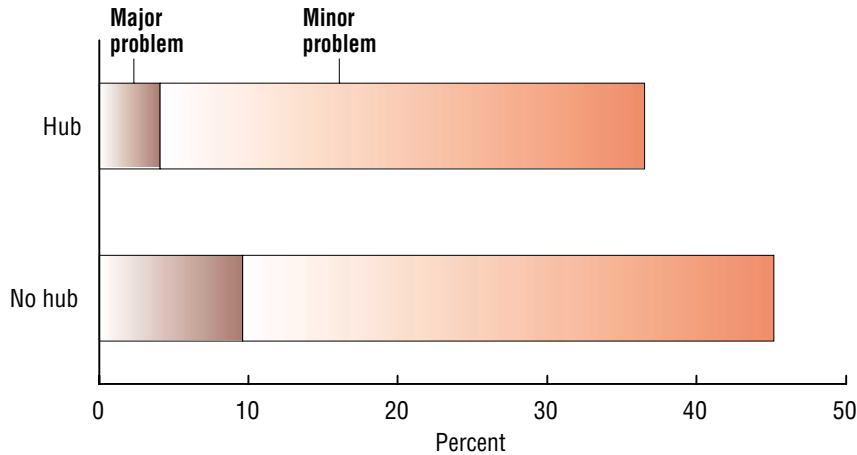


Note: Chart shows percentage of nonmetro establishments that said “access to airport facilities and services” was a major or minor problem affecting their ability to compete.
Regions: New England--ME, NH, VT, MA, RI, CT; Mid-Atlantic--NY, NJ, PA; East North Central--OH, IN, IL, MI, WI; West North Central--MN, IA, MO, ND, SD, NE, KS; South Atlantic--DE, MD, DC, VA, WV, NC, SC, GA, FL; East South Central--KY, TN, AL, MS; West South Central--AR, LA, OK, TX; Mountain--MT, ID, WY, CO, NM, AZ, UT, NV; Pacific--WA, OR, CA, AK, HI.
Source: ERS analysis of Rural Manufacturing Survey, 1996.

Figure 4

Nonmetro manufacturers' airport access, by type of local airport, 1996

Nonmetro businesses without a hub airport in their local area were more likely to report problems with airport access



Note: Figure shows percentage of nonmetro manufacturing establishments that reported access to airport facilities and services as a major or minor problem by type of airport in their multicounty commuting zone. "Hub" airports are the largest 141 airports ranked by annual enplanements.

Source: ERS analysis of 1996 Rural Manufacturing Survey, weighted for stratification.

location, whether it has a hub airport nearby, and its region to determine whether characteristics of a business establishment's location are still important factors after taking into account the characteristics of the establishment.

Several business characteristics have strong statistical associations with the likelihood of reporting airport access problems (table 1). Not surprisingly, establishments that do more business outside of their local area are more likely to report airport access problems. The shares of nonlocal (more than a 1-hour drive) sales, of nonlocal input purchases, and of export sales were associated with greater probability of reporting airport access problems. Manufacturers that used outside experts for technical assistance were also more likely to report airport access problems. Larger establishments (with more employees) and those that had expanded or modernized in the previous 3 years

were also more likely to report airport problems.

Headquarters plants or branch plants of multi-unit companies were no more likely to report airport access problems than were manufacturers with only one location. This contradicts previous studies. Also surprising, the percentage of managers and professionals, the presence of a research and development unit, and the number of telecommunications technologies used was not associated with the likelihood of reporting problems. Previous writings suggested that air travel is more important to high-technology firms with professional employees. Use of telecommunications technologies (Internet, satellite communications, computer links with other companies) suggests stronger links with other companies and perhaps more frequent travel by employees, but telecommunications can also substitute for employee travel. Use of

just-in-time inventory and production management should also be associated with airport access problems because of the importance of regular, frequent shipments, but our model did not find any association.

In addition, we included indicators for 18 broad (2-digit Standard Industrial Classification) manufacturing industry classifications. Holding other business characteristics constant, establishments in the textile, apparel, lumber, furniture, printing and publishing, leather, primary metals, and miscellaneous manufacturing industries were less likely than those in other industries to report airport access problems. Most of these industries tend to be "low-tech" labor-intensive industries, while printing often serves a local clientele. Stone, clay, and glass manufacturers were more likely than other manufacturers to report airport access problems.

Location characteristics are important factors associated with airport problems, even after accounting for the effects of business characteristics. We classified nonmetro counties into four categories of ruralness using a modified version of the ERS Beale codes: county with a large town (county has urban population of 10,000 or more), adjacent or not adjacent to a metro area; and county with a small town (urban population of less than 10,000), adjacent or not adjacent to a metro area. As expected, manufacturers in counties with small towns not adjacent to metro areas were more likely than other nonmetro manufacturers to report airport access problems. The model predicted that an average nonmetro establishment in a county with a small town not adjacent to a metro area had a 10.7-percent chance of reporting a major problem with airport access, compared with 6.7 per-

cent for a similar establishment in a small-town county adjacent to a metro area. Manufacturers in small-town counties adjacent to metro areas were no more likely to report airport access problems than were those in counties with larger towns, whether adjacent or not adjacent to a metro area.

Manufacturers in commuting zones with a hub airport were less likely to report a major problem with airport access than those in commuting zones without a hub airport. West South Central estab-

lishments were more likely than those in other regions to report airport access problems, consistent with survey results. The model found no statistical difference among the other eight regions after accounting for the effects of other characteristics. We did not have enough respondents from Alaska to investigate whether problems were greater in that State, which has many remote areas dependent on air travel and has received a large share of airport spending.

We used the statistical model to calculate the effect of each characteristic on the probability that an average establishment would report a major or minor problem with access to airport facilities and services. This calculation allows us to compare the strength of association between airport access problems and the different characteristics in the model. We compared the

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strength of association between airport access problems and the various business characteristics by changing each characteristic one by one and calculating the resulting change in predicted probability of reporting a major and minor problem. Location characteristics are among the factors most strongly associated with airport access problems. Location in a county with a small town, not adjacent to a metro area, has the strongest effect, increasing the probability of reporting a major problem by 5.2 percent and the probability of a minor problem by 8.6 percent (fig. 5). Location in a commuting zone without a hub airport increased the probability of a major problem by about 3 percent and a minor problem by 5 percent. The effects of using outside technical expertise

Table 1

Business characteristics associated with greater probability of reporting airport access problems

Larger, growing establishments, those that use outside expertise, those that do more business outside their local area, and those located in more rural counties were more likely to report problems with airport access

Characteristics associated with greater airport access problems:

Location in:

- County with small town, not adjacent to metro area
- Commuting zone with no hub airport
- West South Central census division

Larger establishments (more employees)

- Undertook an expansion or modernization within previous 3 years
- Uses outside experts for technical assistance

Purchases a larger share of inputs from outside the local area

- Larger share of sales outside the local area
- Larger share of sales exported

Characteristics not associated with airport problems:

Type of establishment (headquarters, branch, company with single location)

Percent of employees who are managers and professionals

Establishment has a research and development unit

Uses just-in-time management

Uses advanced telecommunications technologies (Internet, satellite communications, intercompany computer links)

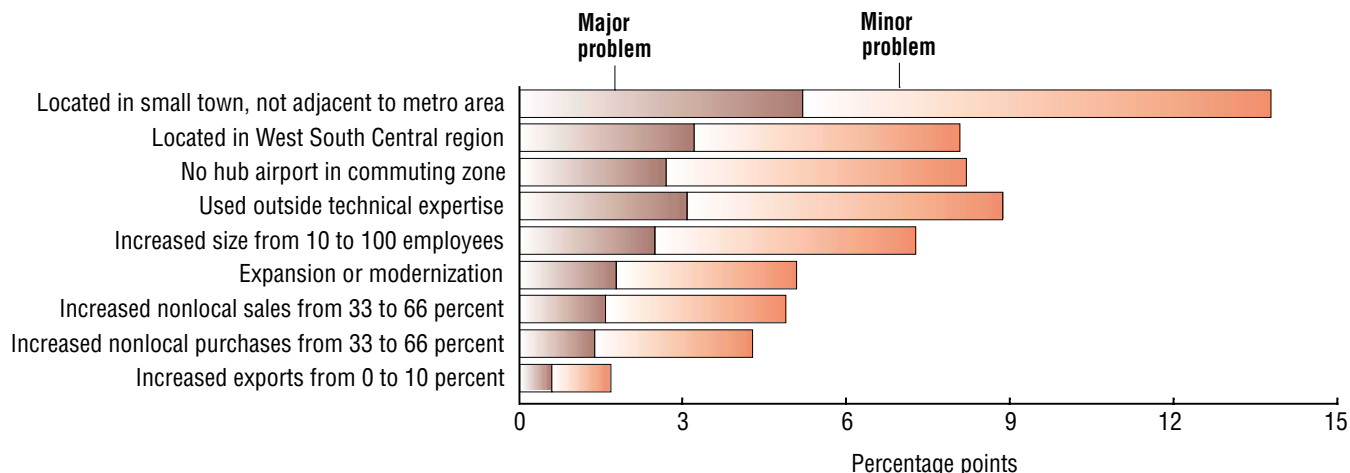
Note: Table is based on a multivariate ordered probit statistical model with dependent variable taking on values of 0, 1, or 2, depending on whether the establishment reported access to airport facilities and services as “not a problem,” “minor problem,” or “major problem,” respectively. The model was estimated with standard statistical procedures using a sample of 2,488 nonmetro manufacturing establishments. Characteristics associated with greater airport access problems had a statistically significant coefficient estimate. Those not associated with airport problems were included in the model, but their coefficient was not statistically different from zero. Indicators for 18 broad manufacturing industries were also included, but effects are not shown here.

Source: ERS analysis of the 1996 Rural Manufacturing Survey, weighted for stratification.

Figure 5

Effects of business characteristics on the probability of reporting problems with airport access, nonmetro manufacturers, 1996

Location in small town, not adjacent to a metro area, had the strongest association with reported airport access problems



Note: Chart shows estimated effects of characteristics on probability that an establishment would report a major or minor problem with access to airports. Estimates are based on an ordered probit model estimated with standard statistical procedures using a sample of 2,488 nonmetro manufacturing establishments. Effects were calculated by computing predicted probabilities of reporting major and minor problems for "low" and "high" values, setting all other variables in the model equal to their mean values.

Source: ERS analysis of the 1996 Rural Manufacturing Survey, weighted for stratification.

Rural Manufacturing Survey

The 1996 Rural Manufacturing Survey asked a nationwide sample of 2,800 rural and 1,200 urban manufacturing establishments to rank 21 factors associated with their location that could affect their business's ability to compete (see Gale and others). The factors included "access to airport facilities and services" as well as access to other modes of transportation, local infrastructure, labor cost and quality, taxes, regulation, and access to customers and suppliers. The survey also asked about important characteristics, such as size, ownership, type of operations, and labor force, technology, marketing, and financing issues.

The interpretation of "airport facilities and services" and what constituted a problem was left up to the survey respondent. Thus, the answers could have varied, and some respondents were more likely to report all kinds of problems than were other respondents. This could have been due to true differences between the locations of the respondents or to differences in respondents' criteria as to what a "problem" is. We are unable to discern between these two. However, additional information can be obtained not only by looking at the frequency with which respondents identified airport access as a problem, but also by looking at the relative frequency with which airport access was reported.

The importance of airport access as a barrier to economic development may be understated by the comparisons in this article due to shortcomings of this survey. Many of the establishments surveyed may have chosen urban locations in order to have good airport access, while airport access may not have been very important to many of those who chose rural locations. This "self-selection" effect may explain why most respondents do not report problems with airport access. The survey does not measure how many urban firms have chosen an urban over a rural location due to better airport access in urban areas.

and location in the West South Central region were of similar magnitude. The effect of increasing establishment size from 10 to 100 employees was slightly smaller, and effects of expansion/modernization and share of nonlocal business were noticeably smaller.

Many Nonmetro Manufacturers Hindered by Airport Access

The reauthorization of air transportation legislation, scheduled for congressional debate in 2000, and decisions about airport construction, improvements, and regulation could guide economic development in rural communities. The rural manufacturing survey data indicate that airport access is a common problem for businesses in the most rural counties, which contain about one-third of nonmetro manufacturing establishments. Air facilities, services, and fares are also important to tourist-related and service businesses in rural areas. While airport access was cited less frequently than labor quality, environmental regulations, taxes, and attractiveness of the area to professional workers (the top five problems for the most rural manufacturers), airport access was cited more frequently than 16 other infrastructure, access, and cost factors (table 2). For rural business locations, airport access seems to be a greater concern than is portrayed in studies of business location decisions, which generally found airports not to be a major concern. This probably reflects an urban bias in most previous studies (most business establishments are in urban areas), since we also found that airport access was one of the least cited concerns of manufacturers in large and medium-sized metro areas.

Table 2

Problems cited by manufacturers in the most rural counties, 1996

Airport access was one of the top five problems associated with business location

Problem	Percent	
	Major problem	Minor problem
Quality of local labor	33	41
Environmental regulations	25	35
State and local taxes	22	41
Attractiveness of area to managers and professionals	18	36
Access to airport facilities and services	13	38
Access to training courses	12	39
Interstates and major highways	11	21
Quality of primary and secondary schools	10	26
Railroad access	9	14
Access to major customers	9	34
Water and sewer systems	9	25
Access to material suppliers	8	36
Cost of facilities and land	8	32
Local roads and bridges	7	27
Local cost of labor	7	28
Access to machinery and equipment suppliers	6	33
Access to information about markets	5	31
Access to financial institutions	4	23
Prevailing local management-labor relations	4	26
Police and fire protection	2	16
Access to legal services	2	24

Note: Table shows data for manufacturing businesses in nonmetro counties with urban population less than 10,000, not adjacent to a metro area.

Source: ERS analysis of the 1996 Rural Manufacturing Survey, weighted for stratification.

While poor airport access may be an important problem for many rural manufacturers, it appears not to be a major constraint on growth of rural businesses. Despite relatively poor airport access in the most rural counties, manufacturers in those counties added employees, undertook expansions or modernizations, and used outside expertise at the same rate as did businesses in metro and more urbanized nonmetro counties. We also found, contrary to expectations, that headquarters and branch plants, those with more management and professional employees, with research

and development units, and those using just-in-time or telecommunications technologies were no more likely to report problems with airport access. Most nonmetro manufacturers with these characteristics were operating in commuting zones without hub airports. These results conflict with previous findings and deserve more study. However, we studied manufacturing businesses only and did not consider other businesses like consulting, legal services, tourism, or other services that may be more reliant upon travel. Also, those businesses for which air service is crucial probably chose

Federal Aviation Administration Airport Classification

The Federal Aviation Administration (FAA) classifies the United States' roughly 18,000 airports into categories based on the type of service available and the volume of traffic. In 1998, 547 airports were classified as offering commercial services, of which 418 were considered primary airports and 141 were classified as small, medium, or large hubs. FAA's definition of a "hub" airport is based only on the volume of traffic. An FAA hub airport is not necessarily a commercial airline "hub," an airport through which a particular airline routes most flights. FAA hubs may or may not be hubs for one or more commercial airlines.

FAA airport classification, 1998

Type of airport	Definition	Airports	Annual U.S. enplanements
		<i>Number</i>	<i>Million</i>
Commercial services	Regularly scheduled service and at least 2,500 annual enplanements		
Primary	At least 10,000 enplanements		
Large hub	At least 1 percent of U.S. enplanements	30	451.7
Medium hub	0.25-0.99 percent of U.S. enplanements	38	130.8
Small hub	0.05-0.24 percent of U.S. enplanements	73	51.4
Nonprimary	Offers regularly scheduled service and 2,500-10,000 annual enplanements	277	21.4
General aviation	Without regularly scheduled service and fewer than 2,500 annual enplanements	17,453 (estimate)	.8

Note: The term "enplanement" refers to a single occurrence of boarding an airplane.
Source: Federal Aviation Administration.

a location with good airport access and would report no problems.

How can access to airport facilities and services be improved in rural areas? Major new airports are large, highly visible, and risky investments, usually unjustifiable in rural areas with limited potential traffic. Air traffic is highly concentrated in a few large airports. Reeder and Wanek suggest carefully targeted maintenance and upgrading of existing smaller local airports. Cost-benefit formulas for airport improvements should incorporate effects on local businesses as well as regulatory decisions that influence the cost, quantity, and quality of service at airports in small communities. Our study does not permit us to quantify the value of airport service to rural businesses, but the results do help show how important airport access is compared with other factors.

Further Reading:

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