United States General Accounting Office

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Report to Congressional Requesters

March 2002

COMMERCIAL AVIATION

Air Service Trends At Small Communities Since October 2000

GAO-02-432

Contents

Tables

Figures

Abbreviations

BTS	Bureau of Transportation Statistics
DOT	Department of Transportation
EAS	Essential Air Service
FAA	Federal Aviation Administration
GAO	General Accounting Office

GAO
Accountability * Integrity * Reliability

United States General Accounting Office
Washington, DC 20548

March 29, 2002

Congressional Requesters:

For the airline industry and air travelers, 2001 was a difficult year. Obviously, the terrorist attacks of September 11 exerted unprecedented effects on the airlines and their passengers. But, the industry's problems preceded those tragedies. Most major U.S. airlines began realizing net operating losses early in the year, and all of the major U.S. passenger carriers except Southwest Airlines reported losses for 2001. United Airlines, American Airlines, and Delta Air Lines each reported losses of more than $1 billion. Delta Air Lines and its passengers experienced a difficult period when the pilots at its regional affiliate Comair went on strike for 89 days, grounding Comair's 815 daily flights. Sun Country Airlines suspended scheduled operations. Travelers throughout the nation shared in the difficulties—passengers at the nation's largest airports did so, as did those at airports serving the nation's small communities.[1]

In recent years, we have reported on the effects of changes in the airline industry on service, including service at small community airports.[2] Concerned about air service to small communities, especially in light of recent events, you asked us to

- describe the overall level of air service at the nation's small communities in 2000 and the main factors that contributed to that service level;
- examine how the nature and extent of air service changed among the nation's small communities in 2001, including a specific accounting for how service changed after the September 11 terrorist attacks; and
- identify key factors that have influenced these changes in air service.

[1] In this report, "small communities" refers to a selected sample of communities served by airports that are defined as "nonhubs" by statute (49 U.S.C. 41731). These small communities include such locations as Altoona, Pennsylvania; Hattiesburg, Mississippi; Salina, Kansas; and Eureka/Arcata, California—communities from which relatively few passengers travel compared with other U.S. airports. The background section of this report discusses the small communities included in this study in more detail.

[2] See, for example, U.S. General Accounting Office, *Airline Deregulation: Changes in Airfares, Service Quality, and Barriers to Entry*, GAO/RCED-99-92 (Washington, D.C.: Mar. 4, 1999) and *Aviation Competition: Regional Jet Service Yet to Reach Many Small Communities*, GAO-01-344 (Washington, D.C.: Feb. 14, 2001). A more complete list of Related GAO Products follows appendix VIII.

Our analysis of air service at these communities is based in part on published airline service schedules for 202 small communities in the continental United States.[3] To assess changes in air service over time, we compared the schedules that the airlines developed for the week of October 15–21, 2000, against two different schedules that the airlines developed for the week of October 15–21, 2001.[4] We assessed general changes in scheduled air service by comparing the October 2000 schedules against schedules for the week of October 15–21, 2001, that the airlines developed before the September 11 attacks. To account more specifically for how service changed in small communities after the September 11 terrorist attacks, we compared the changes in airline schedules against a second set of schedules for the week of October 15–21, 2001, which the airlines developed after the September 11 attacks. We refer to the first as the "original" schedules and to the second as the "revised" schedules.[5] As with our previous reports on changes in airfares and service, we analyzed various changes in service that occurred in these communities such as changes in the number of turboprop and jet departures, changes in the number of carriers providing service, and changes in the number of destinations served with nonstop flights. We recognize that airlines make frequent changes to their service schedules, and that service at these communities may have changed since mid-October, 2001. In addition, we developed an Internet-based questionnaire for managers of small airports we included in the study. This questionnaire allowed the managers to comment on the level of service they were receiving and to provide information to assess factors that might affect schedule changes. We supplemented this work with reviews of other information and interviews with various industry experts and officials. Additional information on the scope and methodology of this report can be found in appendix I.

[3] In addition to the 202 communities we analyzed within the 48 contiguous states, we also analyzed air service at 65 small communities in Alaska and Hawaii. These two states have markedly different patterns of commercial air service from the rest of the United States. To avoid skewing the results, we analyzed them separately. See appendix IV for this discussion. See appendixes I and III for additional information on the communities we studied.

[4] We obtained air service schedule data from the Kiehl Hendrickson Group. The first October 2001 schedule dataset reflected the schedule as of August 30, 2001, and, therefore, does not reflect the airline industry's reaction to the events of September 11. The second schedule dataset for October 15–21 reflected the schedule as of October 12, 2001.

[5] Because our analyses involved a review of "snapshots" in time and the nature of the service may have been fluid, we could not fully measure interim service changes that may have occurred (e.g., carriers initiating service at a community but discontinuing it soon afterwards) within a single time period.

Results in Brief

In October 2000, the typical or median small community in our analysis had service from two airlines, with a total of nine daily departing flights. Forty-one percent of the communities were served by only one airline. Airlines performed the vast majority of these flights—over 80 percent—with turboprop aircraft. The most obvious factor that accounts for the relatively limited level of service at these communities is their size. The median community population was about 120,000, and the median number of daily passenger enplanements in 1999 was about 150. Within the group of 202 communities we studied, those with the smallest populations generally had the lowest levels of service. However, the level of service also varied for two other main reasons. One is the level of local economic activity, as measured by such indicators as employment or per capita income. Small community airports with the highest levels of service tended to be those serving communities with more economic activity, such as Northwest Arkansas Regional Airport (located near the headquarters for Wal-Mart Stores, Inc.) or resort destinations like Key West, Florida. Such communities may have 60 or more scheduled commercial departures per day, while communities at the other end of the scale have only 1 or 2. Another factor that contributes to limited service for many of these communities is their proximity to larger airports. Nearly half of the 202 communities we analyzed are within 100 miles of an airport that serves as a major airline's hub or that is served by a low-fare carrier. This is particularly the case in the eastern half of the United States. Airport directors at many small communities reported that passengers opt to drive to other larger airports for different connections or lower fares from a major airline.

Between October 2000 and October 2001 (revised), the total number of daily departures from these small communities declined by 19 percent. Although carriers had clearly reduced total departure levels at small communities before the September 11 terrorist attacks, airlines made more of the total reduction in departures after September 11. Analyses of industry service levels show that communities of all sizes shared in service reductions. At the typical small community, the number of departures dropped by three flights per day, from nine to six. To the extent that these communities had jet service, it was largely unaffected; nearly all of the decline came in turboprop flights. Service indicators other than the number of departures—such as the number of airlines providing service—also showed general declines, both before and after September 11. For example, the percentage of small communities served by only one airline increased from 41 percent in October 2000 to 47 percent by October 2001, with slightly more of the increase coming before September 11. When one or more carriers pulled out of a community, passengers often lost

connecting service to other destinations. However, while service reductions predominated, airlines initiated service at 14 of the 202 communities. Virtually all of those increases in service had been planned or put in place before September 11.

Because profitability is so critical to the decisions airlines make about what markets they serve and how they serve them, the changes in service levels in small communities can be traced to economic factors. Two such factors—the economic decline that began in early 2001 (according to the National Bureau of Economic Research) and the collapse of airline passenger traffic after September 11—are widely acknowledged as the main contributors to declining profitability in the industry. As the nation's economic performance declined, fewer passengers—especially business passengers who generally pay higher fares—opted to fly, and airline revenues dropped. Carriers sought ways to control costs and did so, in part, by reducing scheduled service to many locations, including small communities. After September 11, passenger traffic and revenues plummeted, exacerbating the situation. As at larger airports, passenger levels at small community airports dropped substantially, according to our survey of small community airport directors. Airlines responded by cutting capacity, partly by reducing the number of flights. Where airlines decided to withdraw altogether from a small community, they most often did so in communities where they were competing with other airlines and had a limited market share. Such competition was more likely to be going on in small communities with populations greater than 100,000; communities with even smaller populations generally already received service from only one airline. As a result, communities with populations above 100,000 tended to see greater service reductions than their smaller counterparts. Besides the economic slowdown and September 11 attacks, airlines' decisions about the makeup and deployment of their fleet also influenced service levels at small communities. For example, some communities lost service when carriers retired certain small types of aircraft.

We provided a copy of the draft report to the Department of Transportation (DOT) for review and formal comment. We also provided sections of our draft report for technical comment to Northwest Airlines, United Airlines, Great Lakes Aviation, and Air Wisconsin. Officials with DOT and the airlines offered only technical comments, which we incorporated into the report as appropriate.

Background

The U.S. air transportation structure is dominated by "hub-and-spoke" networks and by agreements between major airlines and their regional affiliates. Since the deregulation of U.S. commercial aviation in 1978, most major airlines have developed hub-and-spoke systems.[6] For example, Northwest Airlines (Northwest) has hubs in Minneapolis, Detroit, and Memphis. United Airlines (United) has hubs in Chicago (at O'Hare International Airport), Denver, Los Angeles, San Francisco, and Washington, D.C. (at Dulles International Airport). Major airlines provide nonstop service to many "spoke" cities from their hubs, ranging from large cities like Portland, Oregon, to smaller communities such as Des Moines, Iowa, and Lincoln, Nebraska. Depending on the size of those markets (i.e., the number of passengers flying nonstop between the hub and the "spoke" community), the major airlines may operate their own large jets on those routes or use regional affiliates to provide service to other communities, usually with regional jet[7] and turboprop aircraft.

The airports in small "spoke" communities are the smallest in the nation's commercial air system. The Federal Aviation Administration (FAA) and federal law categorize the nation's commercial airports into four main groups based on the number of passenger enplanements—large hubs, medium hubs, small hubs, and nonhubs.[8] Generally, airports in major

[6] For the purposes of this report, major airlines include Alaska Airlines, America West, American Airlines, American Trans Air, Continental Airlines, Delta Air Lines, Northwest Airlines, Southwest Airlines, United Airlines, and US Airways. Seven of these 10 airlines operate hub-and-spoke systems; Southwest, Alaska, and American Trans Air do not. With a hub-and-spoke network, carriers can combine "local" passengers (those originating at or destined to the hub) with "connecting" passengers (those not originating at or destined to the hub but traveling via the hub) on the same flight.

[7] Although regional jets typically seat 32 to 70 passengers, there is no uniformly accepted definition of a regional jet either in the industry or in federal laws and regulations. For example, the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, P.L. 106-181, variously defines a regional jet as having a maximum seating capacity of "not less than 30 nor more than 75" (sec. 210) or "of less than 71" (sec. 231). Within the industry, "regional jet" is sometimes used to describe larger aircraft, such as the Fokker F-100 (107 seats) and Boeing 717 (106 seats), and older-technology aircraft, such as the Fokker F-28 (69 seats) and BAe 146-100 (70-82 seats).

[8] The categories are based on the number of passengers boarding an aircraft (enplaned) for all operations of U.S. carriers in the United States. A large hub enplanes at least 1 percent of all passengers, a medium hub 0.25 to 0.99 percent, a small hub 0.05 to 0.249 percent, and a nonhub less than 0.05 percent. Nonhubs and small hubs are defined in 49 U.S.C. 41731; medium hubs are defined in 49 U.S.C. 41714; and large hubs are defined in 49 U.S.C. 47134. A passenger flying from Baltimore to San Francisco who connects to a different flight in Cincinnati counts as two passenger enplanements. Another passenger who might fly nonstop between Baltimore and San Francisco would represent only a single enplanement.

metropolitan areas—such as Chicago, New York, Tampa, and Los Angeles—are "large hubs." There are 31 large hubs, and they serve the majority of airline traffic, accounting for nearly 70 percent of U.S. passenger enplanements in 1999. At the opposite end of the spectrum are the nonhub airports—the airports for the communities that are the focus of this study. In all, 404 airports were categorized as nonhubs in 1999. As a group, they enplaned only about 3 percent of passengers in 1999. Of those airports, we analyzed 267, which are generally the largest airports within this group.[9] These included 202 small community airports in the continental United States and 65 in Alaska and Hawaii. Table 1 provides more information about the four airport categories, along with an illustration of each type.

[9] We specifically excluded certain nonhub airport communities from our analysis. These included airports where fewer than 2,500 passengers boarded in 1999 (7 per day), along with those that are receiving service subsidized in part by the Department of Transportation's Essential Air Service (EAS) program. For additional information on the EAS program, see U.S. General Accounting Office, *Essential Air Service: Changes in Subsidy Levels, Air Carrier Costs, and Passenger Traffic*, GAO/RCED-00-34 (Washington, D.C.: Apr. 14, 2000). We also excluded nonhub airports located in U.S. territories and those in metropolitan areas with populations of 1 million or more. For additional information on the scope of communities we reviewed, see appendix I.

Table 1: Differences Among Categories of Commercial Airports

Hub category	Number of airports	Percent of total U.S. passengers enplaned 1999	Median number of passenger enplanements, 1999	Example[a]
Large	31	69.7	14,026,868	Lambert-St. Louis International Airport, St. Louis, Mo. 2000 population – 2.6 million[b] 1999 annual enplanements – 15,075,992 number of carriers serving – 18 average daily flights – 560
Medium	37	19.3	3,305,073	Kansas City International, Kansas City, Mo. 2000 population – 1.8 million[b] 1999 annual enplanements – 5,760,037 number of carriers serving – 18 average daily flights – 235
Small	74	7.8	534,218	Springfield-Branson Regional Airport, Springfield, Mo. 2000 population – 326,000[b] 1999 annual enplanements – 349,320 number of carriers serving – 5 average daily flights – 28
Non	404	3.3	20,379	Joplin Regional Airport, Joplin, Mo. 2000 population – 157,000[b] 1999 annual enplanements – 28,877 number of carriers serving – 2 average daily flights – 5

[a] Enplanement data are from 1999. Flight schedule data are for October 15–21, 2001 (revised).

[b] Populations shown are for the metropolitan area.

Source: GAO analysis of enplanement data from FAA, airline schedule data from the Kiehl Hendrickson Group, and population data from the U.S. Census Bureau.

Most Small Communities Had Limited Air Service in October 2000

The typical[10] community of the 202 small communities in our analysis had nine departing flights per day in October 2000, and most had no jet service. They were typically served by two airlines, though 41 percent had service from only one airline. Individually, however, they varied considerably, from having no more than 1 or 2 daily departures to having more than 60. As a group, their limited level of service is related to their small populations. As individual communities, the varied levels of service reflect differences in other factors such as the level of local economic activity and proximity to nearby airports.

[10] In this report, by "typical" community, we mean the "median" community where 50 percent of the communities fall above and 50 percent fall below this midpoint community.

Most Small Communities Had Few Flights and Few Air Carriers, Though Service Levels Varied Considerably

In October 2000, the typical small community among the 202 we analyzed had the following levels of service:

- Service from two different airlines or their regional affiliates, each providing service to a different hub where passengers could make connections to other flights in the airline's hub-and-spoke system. However, a substantial minority of the communities—41 percent—had service from only one airline.
- Nine departing flights a day, most if not all of them turboprops rather than jets. In all, only 67 of the 202 communities had any jet service.[11]

The level of service varied significantly from community to community. At the higher end were airports serving resort destinations like Key West, Florida, where five different carriers operated 44 average daily departures to six nonstop destinations, and communities such as Fayetteville and Bentonville, Arkansas (the headquarters for Wal-Mart Stores, Inc.), near the Northwest Arkansas Regional Airport, where five air carriers scheduled 42 average daily jet and turboprop departures to seven nonstop destinations. The highest number of daily departures—62—was for Nantucket, Massachusetts, a resort community served by turboprop and even smaller piston aircraft. At the other extreme were communities such as Hattiesburg, Mississippi, and Thief River Falls, Minnesota, with an average of 3 and 1 daily departures, respectively. In total, the 10 small communities with the most air service typically had more than 38 scheduled departures per day, while the 10 small communities with the least air service typically had fewer than 3 scheduled departures per day.[12] Table 2 summarizes the range of air service that was available at the 202 small community airports in October 2000.

[11] In this report, we commonly discuss air service at small communities in terms of average daily departures. We calculated those averages by determining the total number of departures scheduled for the entire week and dividing by seven. We stated daily averages then by rounding to the nearest integer.

[12] Two communities had no service scheduled during the week of October 15–21, 2000. For purposes of discussing the range of scheduled service in this paragraph, we excluded those communities.

Table 2: Summary of Air Service at Small Communities, October 2000

Air service dimension	Median	Range[a]
Number of carriers	2	0-6
Number of daily nonstop destinations	2	0-12
Number of daily turboprop flights[b]	8	0-62
Number of daily jet flights[c]	0	0-26
Total number of daily flights	9	0-62

[a]The lower end of the range for each air service dimension was 0 because two communities—Marquette, Michigan, and West Yellowstone, Montana—had no service for the week of October 15–21, 2000.

[b]Includes flights by some piston aircraft at some communities.

[c]Of the 202 small communities, 135 had no jet service in October 2000, which is why the median, or midpoint, community had 0 daily jet departures. Of those 67 small communities that had jet service, the median community had six daily jet departures. This explains in part why the median for total daily departures does not simply equal the sum of the daily turboprop and jet departure median values.

Source: GAO analysis of data from the Kiehl Hendrickson Group.

For purposes of comparison, appendix II provides additional information on key differences in the scope of air service that airlines scheduled at nonhub and small hub communities. Small hub airports tend to serve somewhat larger communities and have significantly more commercial air service than do the 202 nonhub airports in the continental United States.

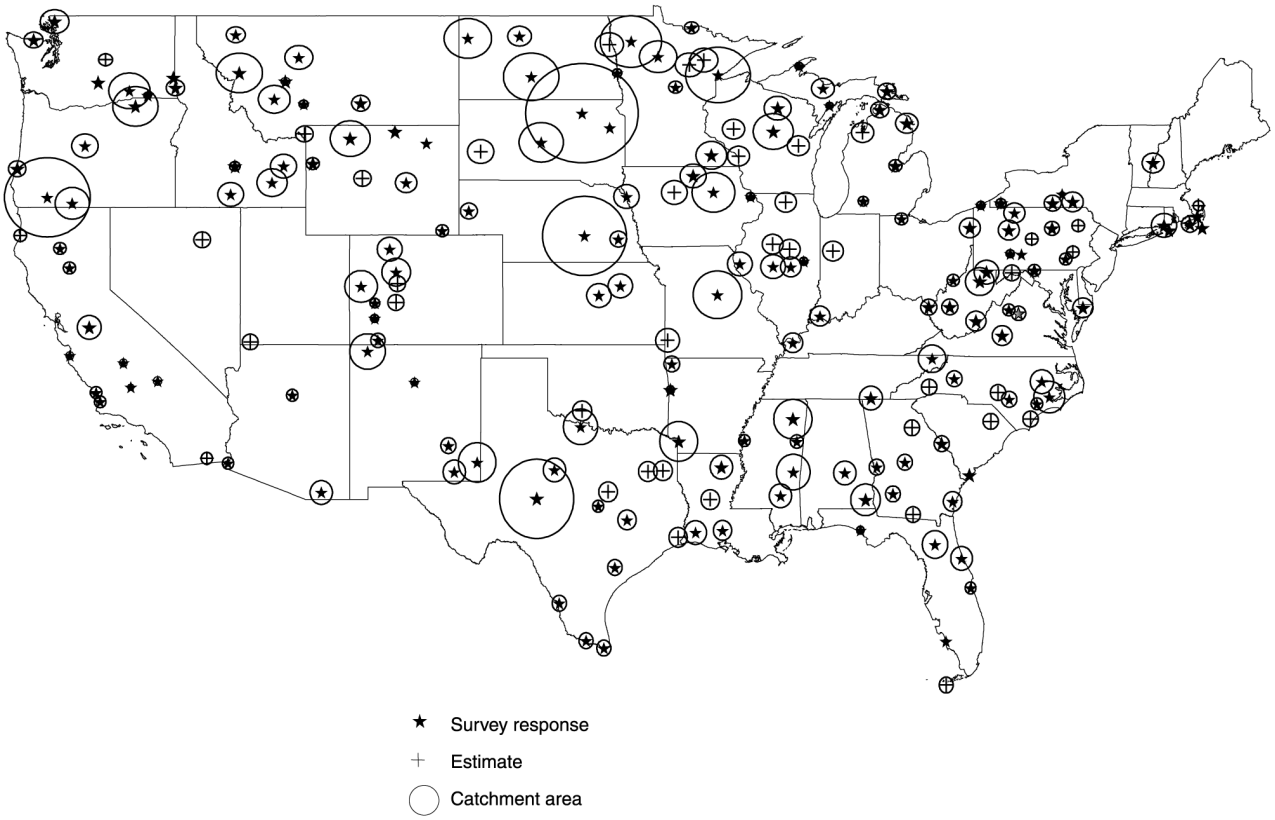
Overall Limited Level of Service Reflects Communities' Small Size

The most obvious reason for the generally limited level of service at these small communities is their small size. As a whole, the 202 airports served a small portion of the U.S. population and geographic territory. In 2000, the median population of the 202 nonhub airport communities in our analysis was about 120,000, and the median number of daily passenger enplanements in 1999 was about 150.[13] However, airports typically serve populations and businesses in a larger surrounding area—typically referred to as a "catchment area." An airport's catchment area is the potential geographic area for drawing passengers. The geographic size of a catchment area varies from airport to airport depending on such factors as how close an airport is to other airports and whether the airport is served by a low-fare airline (and, therefore, attractive to passengers from farther away). Catchment area size estimates provided by the airport directors we surveyed showed that these airports potentially serve a total population of

[13] 1999 is the most recent year for which enplanement data was available.

about 35 million (about 12 percent of the continental U.S. population).[14] Figure 1 shows the location and catchments areas of the 202 airports in our analysis as estimated by airport directors responding to our survey and our estimates of catchment areas for those who did not respond to the survey.

Figure 1: Location and Estimated Catchment Areas of 202 Small Community Airports in the Continental United States



Source: GAO analysis of information from the FAA, Census Bureau, and survey of small community airport directors.

[14] Our representation of airports' catchment area sizes and populations are based on survey respondents' estimates of their own catchment areas. We then used data from the U.S. Bureau of the Census to estimate the population for that particular geographic territory. For airports that did not respond to the survey, we estimated the geographic size of their catchment areas using the mean distance for small community airports in the same geographic region as small community airports that did respond. We then calculated the populations for these areas using the same procedures noted above.

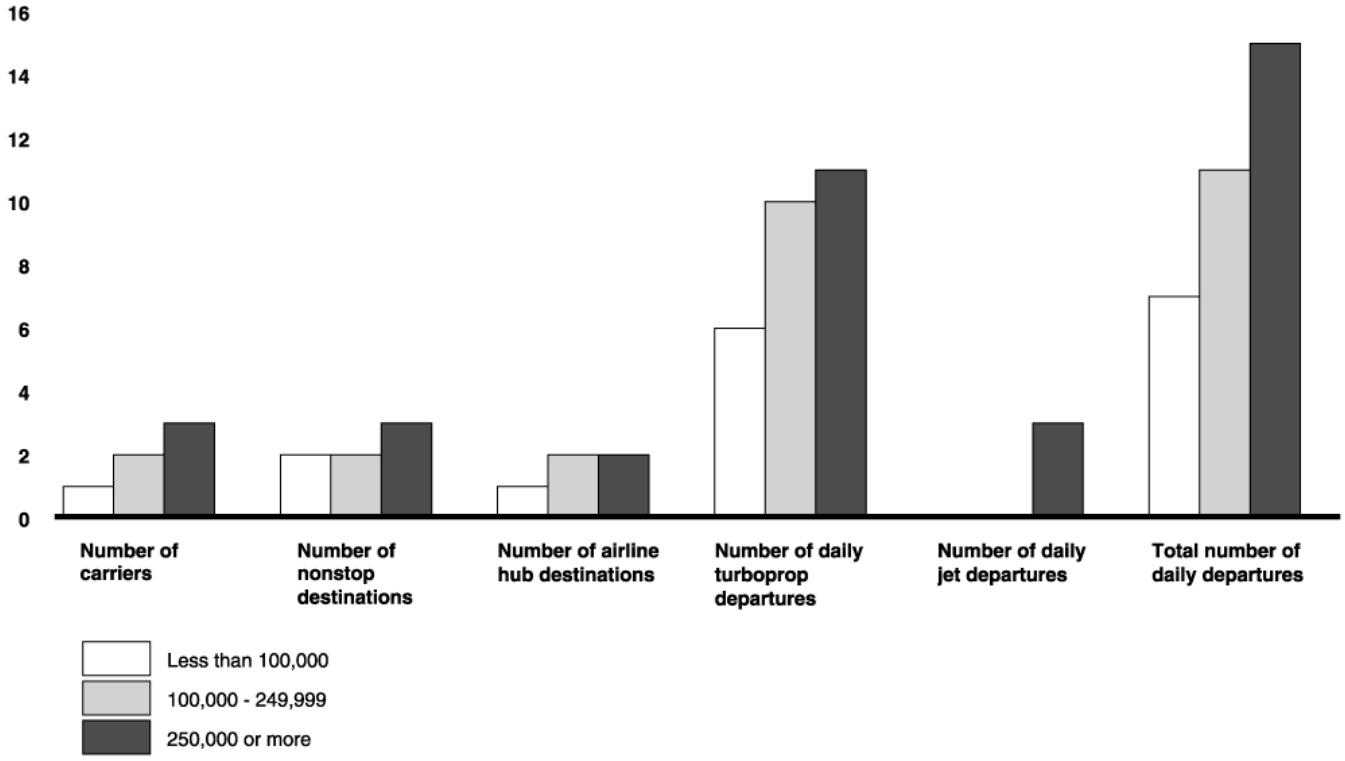
The small size of these markets greatly affects the level of service because airlines' decisions about offering service are motivated primarily by the need to maintain profitability. An airline's profitability generally depends on its ability to generate revenues in a given market while managing its costs. The airline industry is capital- and labor-intensive and is largely dependent on passenger traffic for its revenues. The airlines use sophisticated computer models to help them identify whether certain markets can be served profitably.[15] The limited amount of passenger traffic from many of these communities limits the number of flights airlines provide. It is also not surprising that turboprops have typically provided most service to these communities, because turboprop aircraft are generally the least expensive type of aircraft to buy and operate.[16]

The role of size in limiting a small community's service can be seen by stratifying the small communities into population groups. As part of our analysis, we separated the 202 small communities into three groups—those smaller than 100,000, those with populations of 100,000 to 249,999, and those with populations of 250,000 and greater. As figure 2 shows, the "smallest of the small" typically had lower median levels of service as measured by such indicators as number of daily departures (both turboprop and jet) and service from more than one airline.

[15] These proprietary models take into account such considerations as the carrier's operating costs, estimated passenger traffic, and competition in the market (including the type of aircraft competitors used, the number of daily flights they scheduled, and the fares they charged).

[16] We reported in February 2001 that of the 157 U.S. cities that air carriers served with regional jets in October 2000, only 13 (8 percent) were communities with populations under 100,000. Because regional jets are generally more expensive to purchase and operate than turboprop aircraft, and because air carriers' regional jet deployment strategies are profit driven, the amount of high-yield business traffic is a key factor in those deployment decisions. See U.S. General Accounting Office, *Aviation Competition: Regional Jet Service Yet to Reach Many Small Communities*, GAO-01-344 (Washington, D.C.: Feb. 14, 2001).

Figure 2: Comparison of Air Service Indicators Across Small Communities by Population Category, October 2000 (Median Service Levels)



Source: GAO analysis of airline schedule data from the Kiehl Hendrickson Group.

Variation in Air Service Is Related to Level of Local Economic Activity

Besides population, a variety of other factors may influence how much service an individual community receives. In our analysis, two such factors stood out. One of these was the level of economic activity. The airline industry is highly sensitive to the business cycle, and its economic performance is strongly correlated with fluctuations in personal disposable income and gross domestic product. When the economy is growing, the demand for air transportation grows, allowing carriers to raise yields (prices) and profitability. When the economy falls into recession, unemployment grows, individuals postpone discretionary

travel, and airline yields and profitability decline.[17] In particular, a key element to the profitability of an airline's operation in a given location is the availability of high-yield passenger traffic—that is, business travelers who are more likely to pay higher airfares than leisure travelers. Communities with greater amounts of local business activity may have more (and different) air service than communities with less economic activity. Of course, the reverse may also be true—that local economic activity cannot improve without enhanced air service. Thus, the presence or absence of air service may also positively or negatively affect local economic activity, rather than local economic activity dictating the amount and type of air service.

Our analysis showed a statistically valid relationship between the economic characteristics of small communities and the amount of air service that they received. Economic principles led us to expect that passenger demand for air service would be greater in communities with more jobs and higher incomes. Our results were consistent with these expectations. Larger communities with more income and "regional product"[18] had service from more major carriers and had more weekly departures.[19] For example, for every additional 25,000 jobs in a county, a community received 4.3 more jet departures per week and 4.8 more turboprop departures per week. Similarly, for every additional $5,000 in per capita income, a community received 3.3 more jet departures per week and 12.7 more turboprop departures per week.[20] In other words, if two small communities, A and B, were similar except that Community A had

[17] For an overview of the relationship between overall economic activity and the demand for air transportation, see, for example, Paul Stephen Dempsey and Laurence E. Gesell, *Airline Management: Strategies for the 21st Century*, Coast Aire Publications, 1997.

[18] Regional product is a concept similar to gross domestic product (i.e., the output of goods and services produced by labor and property located in the United States), only measured at the regional level.

[19] We obtained the data used to measure the characteristics of a small community from the Regional Economic Information System database, which is produced by the Bureau of Economic Analysis. These data are somewhat imperfect measures of economic activity at individual communities, in part because they are available only by county, not city. We defined a community's size in terms of both total full- and part-time employment and population, and we defined a community's wealth as per capita income. We used manufacturing earnings as a proxy measure of regional product. We defined the level of service received by small communities as both the number of departures per week (jet and turboprop aircraft) and as the number of major carriers serving a community. See appendix V for a more detailed discussion of this analysis.

[20] These results are statistically significant at the 95-percent level.

$5,000 more in income per capita than Community B, Community A would have had 16 more departures per week than Community B.[21]

Variation Is Also Related to Proximity to Larger Airports

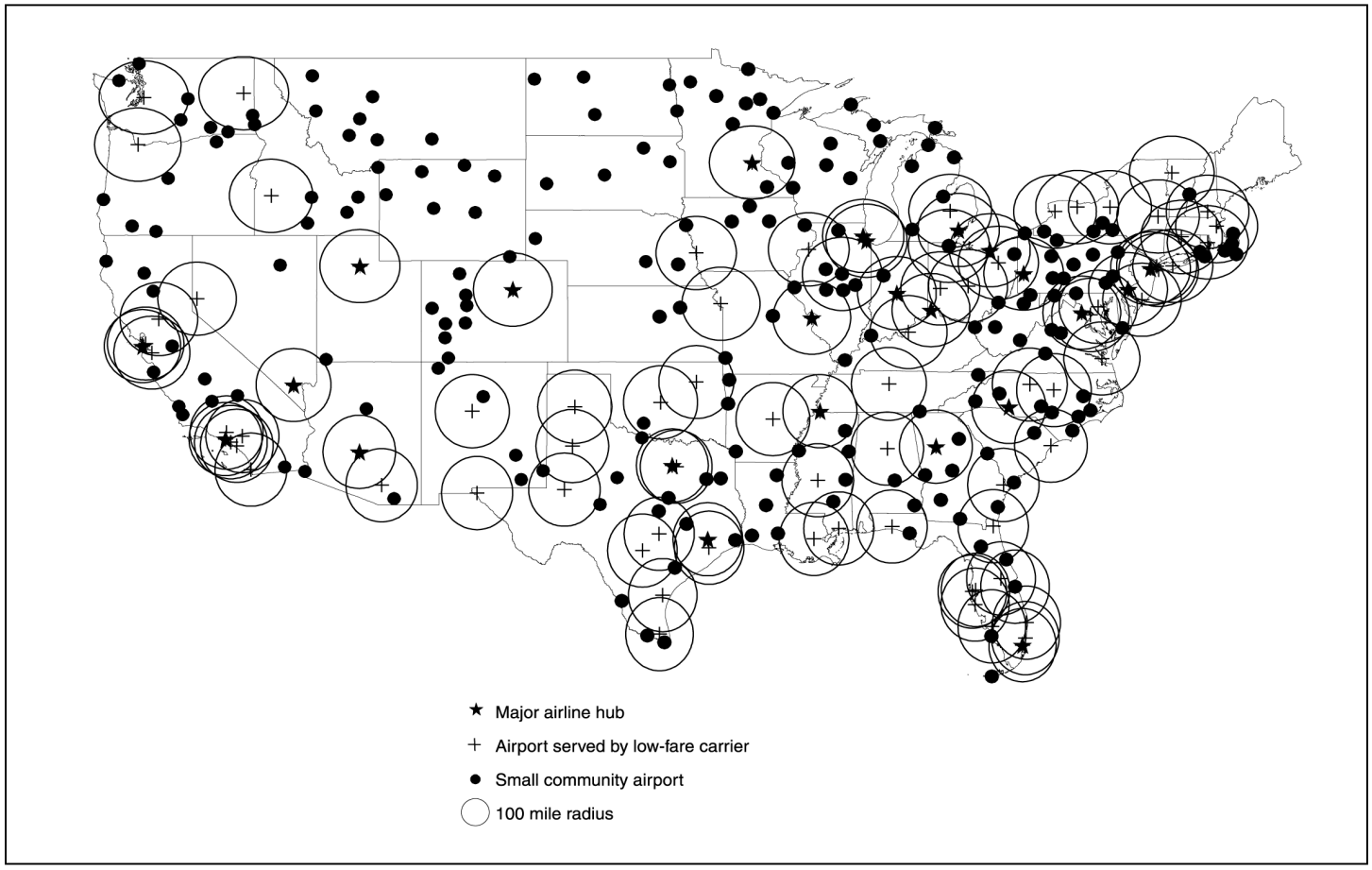
A third main factor that stood out as helping to explain the variation in service levels between small communities, in addition to relative size and economic activity, was the community's relative proximity to larger airports. If a small community is located within relatively close driving distance of another commercial airport, passengers may drive to the other airport, rather than fly to or from the local community airport. This tendency to lose passengers to other airports is referred to as "leakage." Of the 202 small communities in our study, 94 (47 percent) are within 100 miles of an airport that is served by a low-fare airline[22] or that serves as a hub for a major airline.[23] Figure 3 shows circles with 100-mile radiuses around those hub or low-fare carrier airports, and thus the number of small communities that are within 100 miles of those alternative airports. As figure 3 also shows, the concentration of nonhub airports that are close to larger airports is much greater east of the Mississippi River than west of the river. Over 70 percent of the eastern small communities are within 100 miles of a hub or low-fare airport, compared with 26 percent of the western small communities.

[21] The regression model holds other factors constant between the hypothetical communities A and B: population, manufacturing earnings, and distance from an airport served by a low-fare carrier. See appendix V for additional information.

[22] We adopted the Department of Transportation's (DOT) definition of a low-fare airline and included AirTran, American Trans Air, Frontier, JetBlue, Southwest, Spirit, and Vanguard.

[23] Distance between airports was measured in statute (air) miles. Driving distances are thus greater. We used a 100-mile radius to approximate the distance that passengers may travel to reach an alternative airport because officials from one large low-fare carrier have reported drawing passengers from this distance. We also examined the number of small community airports within 50 statute miles of one of these alternative airports. We used 50 statute miles to approximate 70 highway miles, which was the statutory minimum distance used in the EAS program. Small community airports within 70 highway miles from the nearest medium or large hub airport were traditionally ineligible for subsidized air service. Of the 202 small community airports, 10 percent are within 50 statute miles of an airline hub or airport served by a low-fare carrier.

Figure 3: Proximity of Small Community Airports to Other Airports Either Served by a Low-fare Airline or Serving as a Major Airline's Hub



Source: GAO analysis.

Our survey of small community airport officials confirmed the likely effect of being close to alternative airports. When asked whether they believed local residents drove to another airport for airline service (prior to September 11), over half of them said that they believed this occurred to a great or very great extent. Eighty-one percent of them attributed the leakage to the availability of lower fares from a major airline at the alternative airport. According to the results of our survey of airport directors, more small community airports that are closer to other larger

airports experience a greater extent of passenger leakage than small community airports that are farther away from other larger airports.[24]

We were not able to obtain and analyze certain key data that might explain in detail why passengers might opt to use different airports rather than their local facility. In particular, we were not able to obtain information on the differences in airfares among competing airports.[25] However, prior GAO reports indicate that fares at small community airports tend to be higher than fares at larger airports.[26] While choosing to drive to other airports in the vicinity that offer service from other airlines may allow passengers to gain the flight options and fares they want or need—a clear benefit to the individual traveler—it likely affects the local community's ability to attract or retain other competitive air service. In addition, there may be other factors that influence the amount and type of service that air carriers can provide at small communities. As agreed, we intend to examine possible approaches to enhancing air service to these communities in a subsequent report.

[24] Of airport managers at communities more than 100 miles from another airport, 68 percent report that passengers drive to the other airport. Of airport managers at communities less than 100 miles from another airport, 76 percent report that passengers drive to the other airport.

[25] Data on airfares for the quarter including October 2001 would not be available from the Bureau of Transportation Statistics until late February or early March 2002. Additionally, there is a lack of complete and representative fare data for small communities, especially for local passengers who do not connect to large carrier services. This is because public data on airfares is developed from a 10-percent sample of tickets collected from large air carriers, which comprises DOT's "Passenger Origin-Destination Survey" (O&D Survey). Small certificated air carriers and commuter carriers do not participate in the O&D Survey. Thus, there are inherent statistical sampling limitations in the O&D Survey data.

[26] See, for example, U.S. General Accounting Office, *Airline Deregulation: Changes in Airfares, Service Quality, and Barriers to Entry*, GAO/RCED-99-92 (Washington, D.C.: Mar. 4, 1999) and Department of Transportation, *Domestic Airline Fares Consumer Report: Third Quarter 1998 (Special Feature: Fare Premiums by City)*, (Washington, D.C.: April 1999).

Airline Service at Small Communities Declined Between October 2000 and October 2001

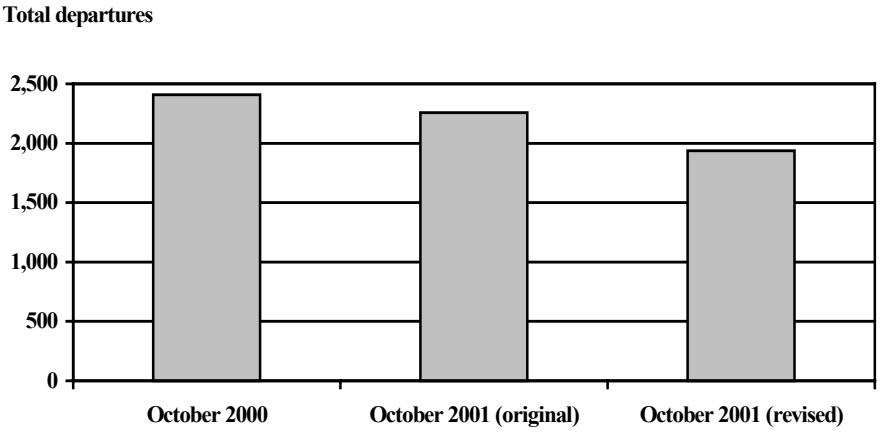
Between October 2000 and October 2001 (revised), the number of total daily departures in small communities dropped by 19 percent. Airlines planned part of these decreases before September 11 (a 6 percent reduction) but made even steeper reductions (13 percent) afterward. In 36 communities, at least one of the airlines providing service withdrew entirely from the market, with most of these withdrawals coming before September 11. The number of communities with service from only one airline grew by 12, raising the percentage of communities with one-airline service to 47 percent. While many communities lost service, carriers initiated service at 14 communities. Nearly all of these gains occurred prior to September 11.

Air Service Levels in Small Communities Declined Both Before and After September 11 Attacks

Airlines substantially reduced total scheduled departures at the 202 small communities we reviewed between October 2000 and October 2001. As figure 4 shows, airlines scheduled an average of 2,406 departures daily during the week of October 15–21, 2000. In their original schedules for the week of October 15–21, 2001 (that is, the schedules prepared before September 11), airlines had planned to operate an average of 2,257 departures per day, a reduction of 6 percent from the October 2000 level. Airlines made further—and sharper—service reductions following September 11. According to our analysis of the airlines' revised schedules for October 2001, the average number of scheduled daily departures from smaller communities dropped to 1,937, or about 320 (13 percent) fewer departures than originally planned. Combined, these schedule changes amounted to a total reduction of about 19 percent from October 2000's flight schedule. The median community in our group of 202 had nine daily departures in October 2000. After the combined drop that was planned both before and after September 11, the median community had six daily departures in October 2001.[27]

[27] To determine if the November 2001 schedule showed any significant change from the revised October 2001 level, we analyzed the airlines' schedules for that month as well. Our analysis showed that the total number of daily departures for November 2001 was essentially the same as that scheduled for October 2001. We recognize that the airlines make frequent adjustments to their schedules and that overall service levels may have changed since then.

Figure 4: Change in Total Daily Departures for Small Communities, October 2000–October 2001



Source: GAO analysis of airline schedule data from the Kiehl Hendrickson Group.

Other industry data regarding service decreases was consistent with the decreases identified in our 202 small communities. According to one industry analysis, the changes in daily scheduled seats from U.S. airports were generally comparable across airports of all sizes. Small hubs experienced a greater relative decrease in service (-15.5 percent) compared to nonhubs (-13.5 percent). Large hubs had the greatest relative decrease in total available seats (-16.3 percent), and medium hubs had a smaller decrease (-12.4 percent).

The 19-percent drop in average daily departures came almost exclusively on turboprop flights. In October 2000, 67 of the 202 communities had some jet service. Airlines tended not to reduce jet flights in those locations where they already were in place. Overall, there were slightly more jet departures in October 2001 than in October 2000. As table 3 shows, median daily turboprop departures dropped from 8 to 6 before September 11 and from 6 to 5 afterward.[28] On other service measures—number of airlines

[28] According to industry sources, some of the decline in turboprop flights and gain in jet flights can be attributed to strategies that carriers adopted in recent years to phase out turboprop aircraft and replace them with regional jets. For example, Atlantic Coast Airlines, Inc., which operates as a United Express and as a Delta Connection carrier, is planning to become an "all-jet" carrier by the end of 2003. More specific information about this strategy is discussed later in this report.

providing service and number of nonstop departures—the median for these communities remained the same.

Table 3: Range of Service Levels Among Small Community Airports, October 2000–October 2001

	October 2000		October 2001 (original)		October 2001 (revised)	
Air service dimension	**Median**	**Range[a]**	**Median**	**Range[a]**	**Median**	**Range[a]**
Number of carriers	2	0-6	2	0-6	2	0-5
Number of daily nonstop destinations	2	0-12	2	0-12	2	0-12
Number of daily turboprop departures	8	0-62	6	0-66	5	0-62
Number of daily jet departures[b]	0	0-26	0	0-32	0	0-29
Total number of daily departures	9	0-62	8	0-66	6	0-62

[a]Some communities had no service scheduled for the week we analyzed; thus, all of the low-range numbers are zeros.

[b]Of the 202 small communities, 135 had no jet service in October 2000, which is why the median, or midpoint, for daily jet departures is 0. Of those 67 small communities that had jet service, the median value for the number of daily jet departures was 6. This explains, in part, why the median for total daily departures does not simply equal the sum of the daily turboprop and jet departure median values.

Source: GAO analysis of airline schedule data from the Kiehl Hendrickson Group.

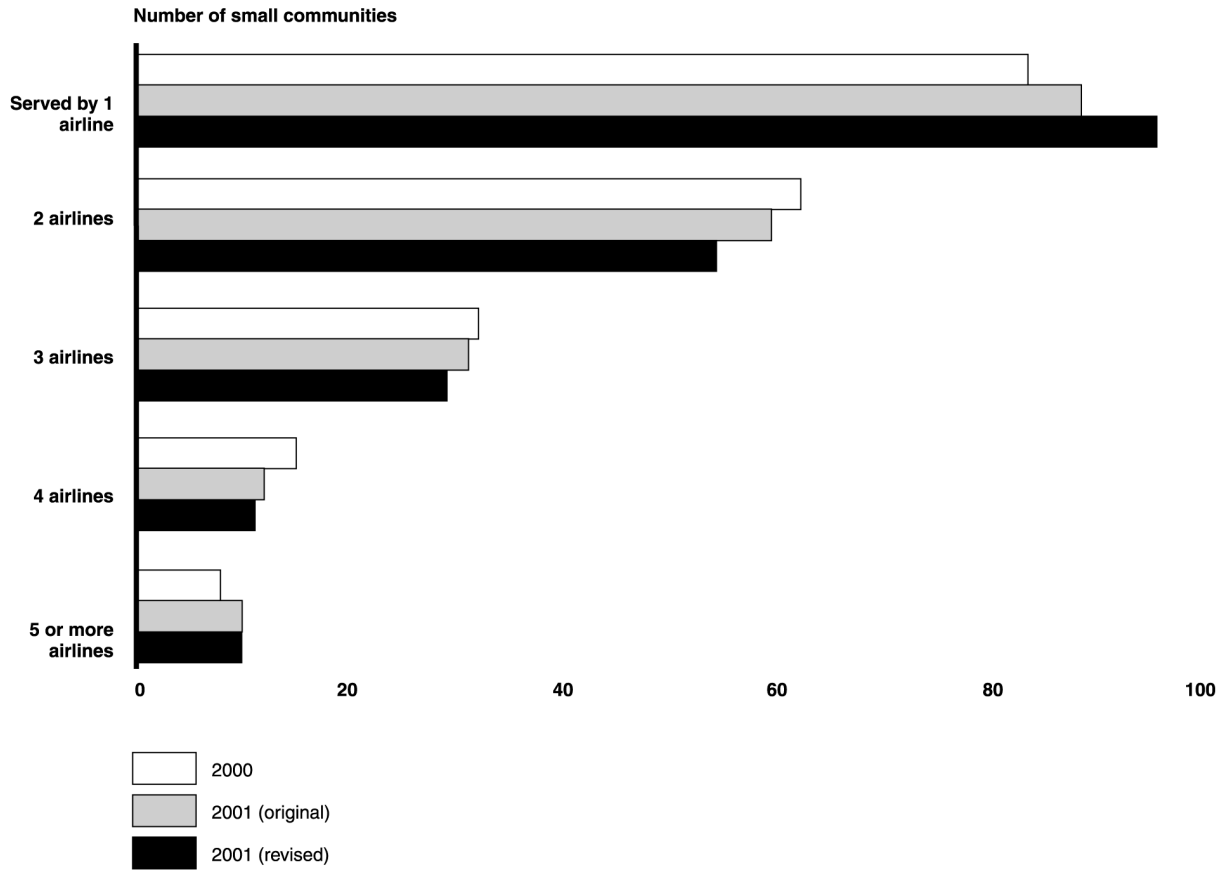
Communities Saw Net Decline in Number of Airlines Providing Service

While the typical small community had the same number of airlines—two—providing service both in October 2000 and October 2001, a number of communities gained or lost a carrier. In the aggregate, the movement was downward, with 36 communities experiencing a net decline in the number of airlines providing service and 14 communities experiencing a net increase. For the 36 communities that lost airlines, most lost them as a result of airline decisions made prior to September 11. Likewise, communities that experienced net gains in the number of carriers did so primarily as a result of airline decisions made before September 11. Among communities that lost airlines, two (Cumberland, Maryland, and Rockford, Illinois) lost service altogether.[29]

The overall effect of these gains and losses was a decrease in the number of communities served by four, three, and two airlines and an increase in the number of communities served by only one airline (see fig. 5). In all, the number of communities served by only one airline increased from 83 (41 percent) to 95 (47 percent) of the 202 communities in our review.

[29] Cumberland, Maryland, has since received service from a different carrier under a state-funded subsidy program.

Figure 5: Change in the Number of Carriers Serving Small Communities, October 2000–October 2001



Source: GAO analysis of airline schedule data from the Kiehl Hendrickson Group.

At a minimum, communities that lost an airline were at risk of losing connecting service to some destinations. Of the 36 communities that lost service from an airline, 5 lost the services of a carrier but did not lose access to other destinations, but 31 lost connecting service to other destinations. For example, when Abilene, Texas, lost its service from one of the two airlines that had been providing service, it lost one-stop connections to 14 destinations. Excluding the 2 communities that lost all service, the other 34 communities lost an average of 12 one-stop connections when one of the carriers discontinued flight operations there.

Service changes at Lake Charles, Louisiana, illustrate what happens when an airline withdraws from a market. In October 2000, Continental Express and American Eagle both served Lake Charles Regional Airport. Continental Express was the dominant carrier, providing 40 weekly flights (57 percent of the total capacity, as measured by the number of available seats on departing flights). After September 11, American Eagle discontinued its 27 weekly flights from Lake Charles to Dallas-Fort Worth. Continental Express continued to fly, offering 38 weekly flights (2 fewer) to Houston. The loss of American Eagle's service also meant that Lake Charles's passengers could no longer reach 13 other destinations via one-stop connections at Dallas—destinations that Continental did not serve.

It is difficult to assess the effect of losing a carrier on competition at a particular community. For one thing, the number of carriers providing service to a small community is an imperfect measure of competition. In the airline industry, competition is normally defined in terms of the number of different carriers serving the same city-pair market—that is, the route between the same two cities. Most small communities that received service from two or more carriers had nonstop flights to two or more airlines' hubs. In the nonstop markets between the small community and those hubs, there was probably little direct competition initially; passengers, therefore, experienced little if any loss of competition on those routes if one of the carriers discontinued service.[30] However, if the passenger's final destination was not an airline hub city, then different airlines may compete directly in offering connecting service to the same destination city but through their different respective hubs. In such cases, the loss of an airline's service at a small community means the loss of a competitive choice. Where competition is lost, the risk that consumers may be subject to higher airfares increases.[31]

[30] An airline may be able to carry passengers to another airline's hubs with connecting service over the first airline's hubs. That connecting service may exert some competitive restraint on prices. However, connecting service does not always represent an adequate substitute for nonstop service, especially for business travelers.

[31] A number of studies—including our own—have shown that markets with fewer competitors, especially those dominated by a single carrier, have higher fares. See, for example, Steven A. Morrison, "New Entrants, Dominated Hubs, and Predatory Behavior, " Statement before the Subcommittee on Antitrust, Business Rights, and Competition, Committee on the Judiciary, United States Senate (Apr. 1, 1998). See also U.S. General Accounting Office, *Airline Competition: Higher Fares and Less Competition Continue at Concentrated Airports*, GAO/RCED-93-171 (Washington, D.C.: July 15, 1993). And as noted earlier, prior GAO reports indicate that fares at small community airports tend to be higher than fares at larger airports.

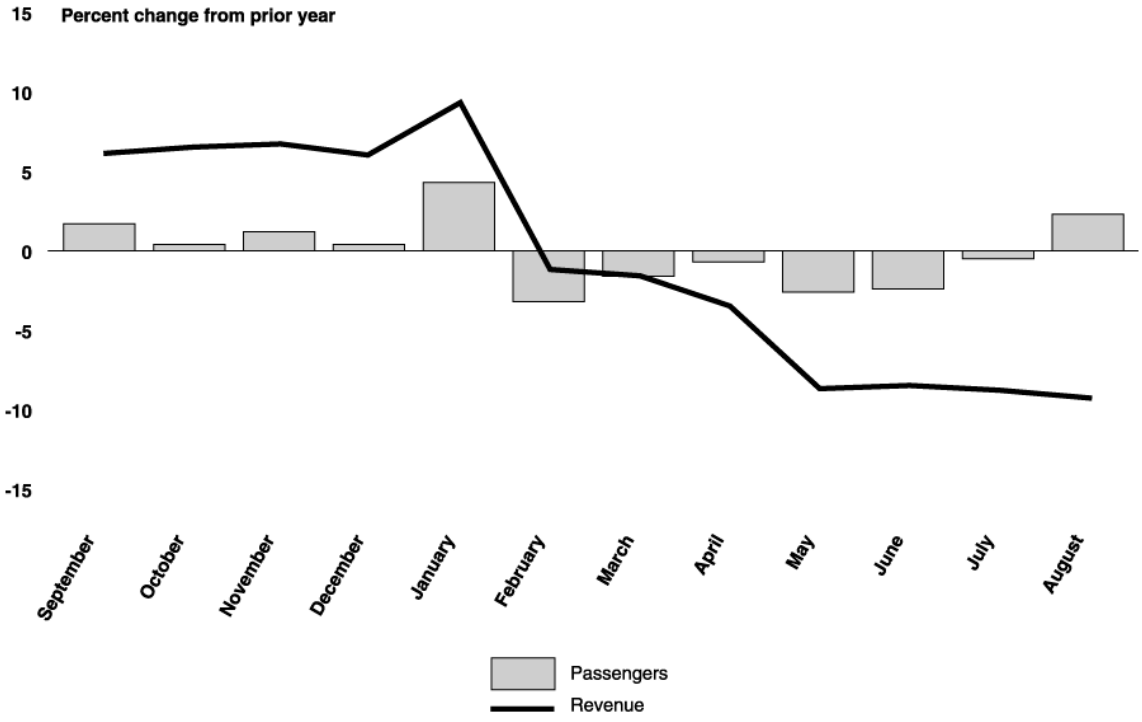
National Economic Decline and September 11 Attacks, Along with Airlines' Strategic Decisions, Underlie Shifts in Air Service

Two primary external events that occurred since October 2000—the economic decline that began in early 2001 and the collapse of airline passenger traffic after September 11—significantly affected carriers' financial conditions and thus influenced decisions about service throughout their networks, including service to small communities. As the nation's economic performance declined, fewer passengers opted to fly. Consequently, airline revenues dropped, and airlines sought ways to control costs. They did so, in part, by reducing scheduled operations. In many small communities, they reduced the number of flights they were providing, and in some communities where they had a small portion of the market, they pulled out altogether. After September 11, passenger traffic and revenue plummeted, exacerbating the situation. Beyond their reactions to the economic slowdown and the events of September 11, airlines also made some changes on the basis of long-range decisions about the composition and deployment of their fleets—decisions, generally, to reduce turboprop operations and increase regional jet service. Some communities lost service as carriers retired certain types of small aircraft.

Broad National Economic Decline and September 11 Attacks ad Significant Effects on Airline Service Levels Nationwide

Nationally, the U.S. economy slowed down during 2001 and moved into its first recession (as defined by the National Bureau of Economic Research) since 1991. This change in the national economy is reflected in airline passenger and revenue data. In the latter parts of 2000, monthly airline passenger traffic and revenue were still growing compared with the same periods in 1999. But beginning in February 2001, passenger traffic generally declined. Additionally, reflecting a drop in high-yield business traffic, total passenger revenues decreased at a steeper rate than passenger traffic, as shown in figure 6. For the U.S. airline industry as a whole, data from the Bureau of Transportation Statistics (BTS) indicate that airlines' net income turned negative in the second quarter of 2001. Simultaneously across the industry, airline costs were rising. Carriers began efforts to control costs, in part by reducing service. As the economy slowed down, industry analysts projected that U.S. commercial airlines would lose over $2 billion in 2001.

Figure 6: Change in Total U.S. Passenger Enplanements and Revenue, September 2000–August 2001

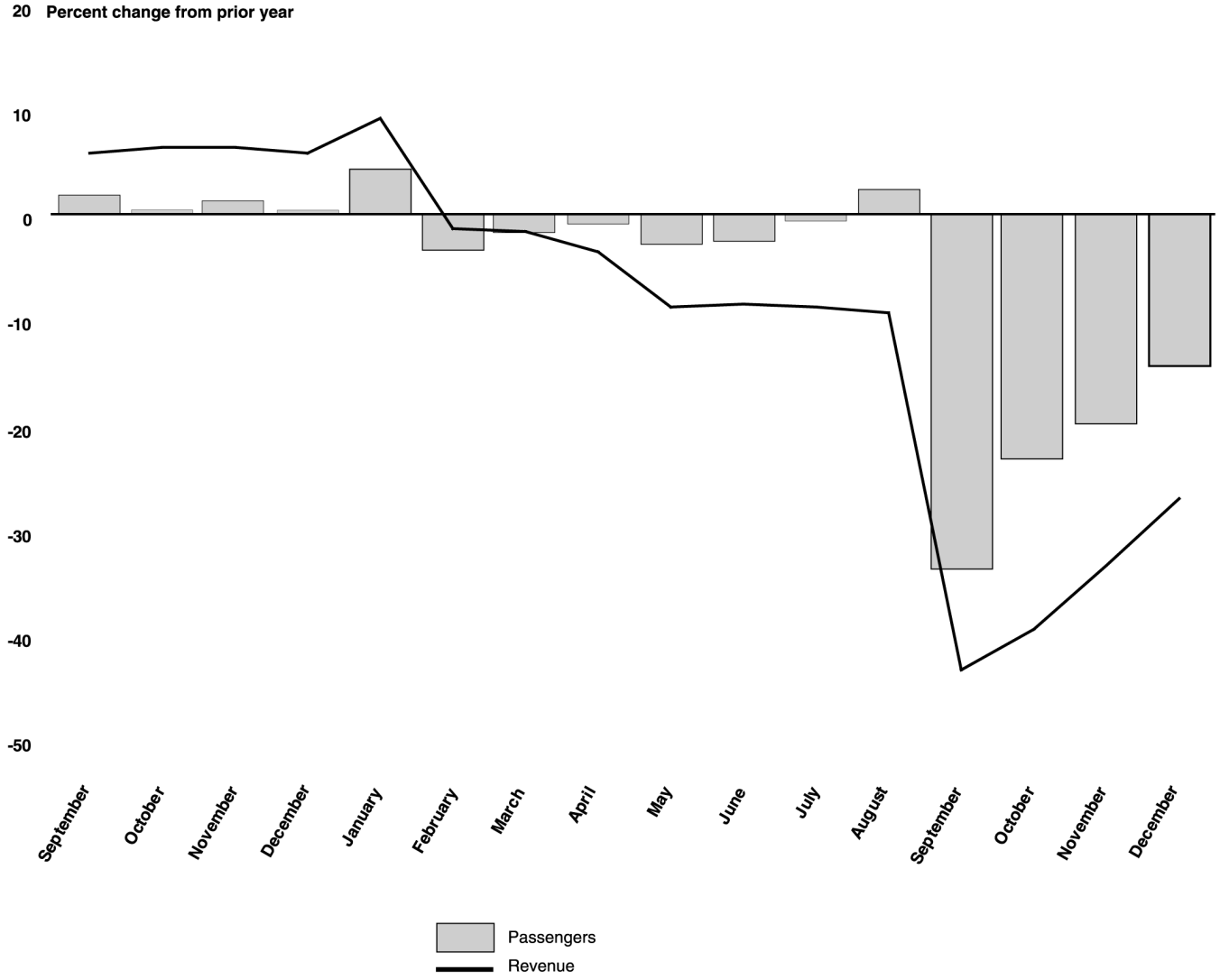


Source: GAO presentation of data from the Air Transport Association.

The events of September 11 accelerated and aggravated negative financial trends already evident in the airline industry. In response to significant losses experienced by the carriers stemming from the temporary shutdown of the nation's airspace and the drop in passenger traffic, the president signed the Air Transportation Safety and Stabilization Act, which provided up to $4.5 billion in emergency assistance to compensate the nation's passenger air carriers for these losses. [32] The change in the airlines' financial condition may be attributable to both the continued deterioration of passenger revenues and the inability of airlines to cut their expenses proportionately. Figure 7 shows the significant drop in passenger traffic after September 11. Data from BTS indicate that passenger enplanements between September 2000 and September 2001 on large air carriers dropped by over 34 percent nationally.

[32] P. L. 107-42. The act also provided up to $500 million in grants to all-cargo airlines.

Figure 7: Passenger Traffic and Revenues Before and After September 2001



Source: GAO presentation of data from the Air Transport Association.

As passenger traffic and revenues plummeted, carriers' efforts to control costs included significant reductions in total capacity—in other words, service reductions. These reductions were dramatic. According to data from BTS, carriers flew 20 percent fewer departures in September 2001 than in September 2000. Different airlines approached such cost-cutting in different ways. For example, US Airways retired 111 older aircraft from its fleet, eliminating its Boeing 737-200s, MD-80s, and Fokker F-100s. Some

carriers also replaced service from their large mainline jets with smaller aircraft operated by regional affiliates to better match capacity with passenger demand, as United did in some markets. In addition, United reduced the total number of departures in its system from about 2,400 before September 11 to 1,654 by October 31, in part by reducing early morning and late evening flights. Service to smaller communities was affected as part of the overall decrease in operations.

Service Decisions for Small Communities Reflect Airlines' Attempts to Adjust to the National Downturn

These two factors—the economic downturn and aftermath of September 11—played out in small communities as well as in larger markets. As with the nation as a whole, small communities saw dramatic decreases in passenger traffic. According to our survey of airport officials, passenger traffic at small communities fell by 32 percent between September 2000 and September 2001—about the same percentage that, according to BTS data, passenger traffic decreased throughout the country. Over 80 percent of the airport managers we surveyed reported that passenger fear (that is, general apprehension related to the events of September 11, 2001) was a key factor in decreased enplanements at their airport since September 11. Airport directors also reported that passenger enplanements dropped because of air carrier service changes (e.g., fewer departures, smaller aircraft, or fewer carriers). In addition, managers indicated that basic economic conditions and post-September 11 airport security requirements reduced enplanements. Thus, the general reductions in service that occurred at small communities can be seen as reflecting airlines' overall response to these factors.

Another way that these factors can be seen at work in small communities is in the decisions airlines made to withdraw from a community. In most cases, when an airline withdrew entirely from a community, it was a community in which the airline was competing with other airlines and had only a limited market share. More specifically, of the 36 small communities that lost a carrier between October 2000 and October 2001, there were only six instances in which the carrier that discontinued operations was the largest service provider at the community.

The effect of these decisions to withdraw from multiple-carrier markets can be seen in one characteristic we observed in the airline schedule data we analyzed: Among the 202 communities we analyzed, service reductions tended to be greater in those communities with populations above 100,000 than in communities with populations below 100,000. This was true across several types of service indicators, such as number of carriers, total number of daily departures, and number of nonstop flights to more than

one destination. Across all these indicators, communities with populations below 100,000 typically had lower levels of service than their larger counterparts both in October 2000 and October 2001, but compared with these larger communities, they lost less of that service during the 1-year period we measured. One reason may be that over half of small communities with populations less than 100,000 were served by only one airline, both in October 2000 and in October 2001. Thus, airlines' decisions to withdraw from multiple-carrier markets had little effect on them.

Internal Airline Strategies Dictated Other Schedule Changes

While the economic downturn and the events of September 11 were potent factors in shaping airline service to small communities, some of the changes that were occurring reflected airline efforts on other fronts. The number of departures or available seating capacity at some small community airports changed when some major airlines directed their regional affiliates to shift some of their aircraft fleets to operate at different hubs in their systems.[33] Similarly, changes in the number of departures or available seating capacity at some small community airports reflected strategic decisions that carriers had made about the composition and deployment of their fleets—decisions to replace their turboprop aircraft with regional jet aircraft. These decisions were made with the concurrence of the regional carriers' mainline partners. Three examples illustrate how such restructurings often affected service to some small communities.

Northwest's Restructuring with Regional Affiliates

According to a Northwest official, the carrier began restructuring parts of its Northwest Airlink regional fleet in 2002. Northwest began retiring turboprops at its wholly-owned affiliate, Express Airlines I, while increasing the number of regional jets in that carrier's fleet and deploying them at all three of its hubs—Detroit, Minneapolis/St. Paul, and Memphis. Northwest decided that its other regional carrier, Mesaba Airlines, would become the sole operator of turboprops at its hubs beginning in February 2002. Mesaba also operates 69-seat regional jets.

[33] The relationship between the mainline carrier and regional affiliate can take several forms, varying from outright ownership by the major airline, to partial ownership by the major airline, to a marketing alliance devoid of any ownership by the major airline. For example, American Eagle airlines is a wholly owned regional carrier subsidiary of AMR Corp. (the parent company of American Airlines), Mesaba Airlines is partially owned by Northwest, and United contracts with several airlines to operate as its regional carrier, United Express, in certain markets.

According to our analysis, between October 2000 and October 2001, Express Airlines I and Mesaba altered service at 60 small communities. Overall, more small communities lost service than gained service from these carriers during this period. A total of 49 small communities lost some capacity (e.g., through a reduction in flight frequency or use of smaller aircraft) from these carriers, with four of them losing service from Express Airlines I and Mesaba entirely because, according to a Northwest official, they were no longer profitable.[34] On the other hand, 11 communities gained service—9 of them gaining additional flights or extra capacity through larger aircraft, and 2 gaining start-up service from the two airlines. Appendix VI provides more information about the small community service changes made by Express Airlines I and Mesaba between 2000 and 2001.

United's Contract Renegotiation with One of Its Regional Affiliates

Service changed at some communities when United renegotiated the contract with one of its regional carriers—Great Lakes Aviation. In 2000, both Great Lakes and Air Wisconsin served as United Express carriers operating between United's Chicago and Denver hubs. However, beginning in May 2001 under a revised contract, Great Lakes no longer operated as a United Express carrier and instead continued in a "codesharing"[35] relationship with United. Under this new arrangement, Great Lakes could decide which markets it served, but United was free to decide whether or not to codeshare on those routes. Furthermore, United expanded the amount of service Air Wisconsin (as a United Express carrier) provided to many of these communities.

Of the 202 communities in our study, 16 were served by Great Lakes, 15 by Air Wisconsin, and 9 by both. Between October 2000 and October 2001, United's changes altered air service between 39 of the 40 communities served by one of these carriers. Of the 39 communities with service changes, Great Lakes pulled out completely from 4. Either Great Lakes or Air Wisconsin decreased capacity at another 30 communities. Five

[34] Of the four communities that lost service from Express Airlines I and Mesaba, Northwest continued to serve one (Bismarck, North Dakota) with mainline operations.

[35] Codesharing allows an airline to sell seats on its partner's plane as if they were its own, enabling the airline to expand its route network without adding any planes. For example, if United and Great Lakes have a codesharing agreement and United flies from Chicago to Denver (and Great Lakes does not), and Great Lakes flies from Denver to Cody, Wyoming (and United does not), then United could sell tickets from Chicago to Cody as its own flight, and the computer reservation system would indicate that United provides seamless ("on-line") service to these cities.

communities gained new service or additional capacity. Appendix VII provides more information about the communities and how they were affected.

Some Regional Carriers Adopt "All-Jet" Strategies

According to industry sources, some of the decline in turboprop flights and gain in jet flights can be attributed to strategies that some carriers adopted in recent years to phase out turboprop aircraft and replace them with regional jets.

For example, Atlantic Coast Airlines, Inc., which operates as a United Express and as a Delta Connection carrier, is planning to become an "all-jet" carrier by the end of 2003. In October 2000, Atlantic Coast operated 87 aircraft, including 34 regional jets and 53 turboprops, to 51 destinations from Washington Dulles and Chicago O'Hare. Of those 51 markets, 21 were served exclusively with turboprops. In October 2001, Atlantic Coast operated 117 aircraft, including 81 regional jets and 36 turboprops, to 60 destinations. Of those 60 markets, 15 were served exclusively with turboprops. By December 2001, Atlantic Coast had retired all of its 19-seat turboprop aircraft and ended service to two small communities—Lynchburg and Shenandoah Valley, Virginia—when it did so. Other regional carriers, such as American Eagle and Continental Express, have also decided to become "all-jet" carriers.

Concluding Observations

It is not surprising that most small communities have fewer carrier options and less competition than larger communities. The economics of airline operations—that is, the need to cover the cost of operating turboprop or jet service with sufficient passenger revenue—mean that small communities that generate relatively little passenger traffic make profitable operations difficult. Because small communities generate relatively little passenger traffic (especially high-fare business traffic), they tend to have more limited air service than larger communities. As a result, passengers who use these communities' airports often have less service: fewer nonstop flights to fewer destinations.

The declines in air service at small communities in 2001 generally paralleled declines at larger airports. However, because small community airports had much more limited service initially, such decreases may subject passengers to or from those communities to significant effects. For example, when small communities lose a competitive air carrier choice, they may lose access to many destinations through one-stop connecting service. Similarly, although we were unable to analyze how airfares changed when the number of carriers serving a community changed,

travelers to or from those communities that lost service from one or more carriers may be more vulnerable to noncompetitive pricing and service patterns.

The number of communities subject to this vulnerability increased during 2001. Because of the relationship between economic activity and air service, airlines may restore some air service at small communities when local economic conditions improve. However, trends in the industry—such as the replacement of some turboprop aircraft with regional jets—may make it increasingly difficult for air carriers to operate competitive and profitable air service to some small communities.

Agency Comments

We provided a copy of the draft report to DOT for review and formal comment. We also provided sections of our draft report for technical comment to Northwest Airlines, United Airlines, Great Lakes Aviation, and Air Wisconsin. Officials with DOT and the airlines offered only technical comments, which we incorporated into the report, as appropriate.

We are sending copies of this report to the Honorable Norman Y. Mineta, secretary of transportation; United Airlines; Northwest Airlines; the Regional Airline Association; and other interested parties. We will also send copies to others upon request.

If you or your staffs have any questions about this report, please contact me, HeckerJ@gao.gov, or Steve Martin at (202) 512-2834, MartinS@gao.gov. Other key contributors to this report are listed in appendix VIII.

JayEtta Z. Hecker
Director, Physical Infrastructure Issues

List of Congressional Requesters

The Honorable John Rockefeller, IV
Chairman, Subcommittee on Aviation
Committee on Commerce, Science, and Transportation
United States Senate

The Honorable Don Young
Chairman
The Honorable James Oberstar
Ranking Minority Member
Committee on Transportation and Infrastructure
House of Representatives

The Honorable John Mica
Chairman
The Honorable William Lipinski
Ranking Minority Member
Subcommittee on Aviation
Committee on Transportation and Infrastructure
House of Representatives

The Honorable Olympia Snowe
The Honorable Ron Wyden
United States Senate

The Honorable John Peterson
House of Representatives

Appendix I: Objectives, Scope, and Methodology

This report examines the changing air service conditions in small communities. Our work focused on three objectives: (1) describing the overall level of air service at the nation's small communities in 2000 and the main factors that contributed to that service level; (2) examining how the nature and extent of air service changed among the nation's small communities in 2001, including a specific accounting for how service changed after the September 11 terrorist attacks; and (3) identifying key factors that have influenced these air service changes.

To analyze the overall level of service in 2000 and how the nature and extent of air service at small communities changed in 2001, we first defined the universe of small communities. We began by including all nonhub and small hub airports, which various statutes define as small communities.[36] We then narrowed that definition by including only those nonhub and small hub airports included on the Air Carrier Activity Information System (ACAIS) that supports the Federal Aviation Administration's (FAA) Airport Improvement Program (AIP) entitlement activities. The ACAIS database contains data on cargo volume and passenger enplanements submitted by air carriers to the Department of Transportation (DOT).

The ACAIS database categorizes airports by the number of annual enplanements. According to a DOT official, there are three categories:

- Primary: Public airports with scheduled, commercial air service with at least 10,000 annual enplanements. These airports are eligible for a minimum entitlement AIP funding of between $650,000 and $1 million.[37]
- Nonprimary: Public airports with scheduled, commercial air service with annual enplanements between 2,500 and 9,999. These airports are not

[36] For example, the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (AIR-21), P.L. 106-181, defines small communities as including both nonhub and small hub community airports. The categories of airports—large hub, medium hub, small hub, and nonhub—are defined by statute. Nonhubs and small hubs are defined in 49 U.S.C. 41731; medium hubs are defined in 49 U.S.C. 41714; and large hubs are defined in 49 U.S.C. 47134. The categories are based on the number of passengers boarding an aircraft (enplaned) for all operations of U.S. carriers in the United States. A large hub enplanes at least 1 percent of all passengers, a medium hub 0.25 to 0.99 percent, a small hub 0.05 to 0.249 percent, and a nonhub less than 0.05 percent. In 2000, there were a total of 546 airports: 31 large hubs, 37 medium hubs, 74 small hubs, and 404 nonhubs. The Federal Aviation Administration (FAA) sometimes defines hubs as geographic areas rather than as airports. In this report, however, when we discuss hubs, we are referring to airports.

[37] 49 U.S.C. 47114(c)(1)(B).

eligible for AIP entitlement funds, but are eligible for "commercial service funds," which are discretionary AIP funds.

- Other: Airports that have scheduled service, but not necessarily commercial service and have less than 2,500 enplanements.

To limit the scope of our research, we included only those airports that had more than 2,500 annual enplanements (approximately 7 passengers enplaning per day) in 1999. From this list, we eliminated airports that were located in territories, those at which commercial service was subsidized through DOT's Essential Air Service (EAS) program as of July, 2001,[38] those for which our data indicated that carriers had scheduled no service at any time between June 2001 and July 2002, and those nonhub airports that were located in metropolitan areas with populations of one million or greater (e.g., Meigs Field in Chicago). We eliminated the latter group of airports because travelers in those metropolitan areas are not limited to air service from the small airport; rather, they have a choice of other larger airports in the immediate area.

We then compared various aspects of air service at the nonhub and small hub airports to see if there was a significant difference between the two. Based on that analysis and agreement with the requesters' staffs, we defined small communities as those served by nonhub airports that met the above-mentioned conditions. Table 4 summarizes the number of nonhub airports affected by each of these filters.

[38] We agreed with requesting members' staffs to exclude communities that received subsidized service from the Essential Air Service (EAS) program because of the inherently different situation with commercial air service in those locations. The Airline Deregulation Act of 1978 guaranteed that communities served by air carriers before deregulation would continue to receive a certain level of scheduled air service. Under the EAS program, the federal government subsidizes air carriers to provide service to certain small communities. For additional information on the EAS program, see U.S. General Accounting Office, *Essential Air Service: Changes in Subsidy Levels, Air Carrier Costs, and Passenger Traffic*, GAO/RCED-00-34 (Washington, D.C.: Apr. 14, 2000). In addition, GAO is initiating a separate review of the EAS program in early 2002.

Table 4: Number of Nonhub Airports Eliminated by Various Selection Criteria

Selection criteria	Nonhub airports
Initial number of airports	404
Airports in U.S. territories	(12)
Airports had no scheduled service from June 2001 to July 2002	(41)
Airports receiving EAS-subsidized service[a]	(61)
Airports in metropolitan areas of 1 million or more[a]	(23)
Total airports analyzed	**267**

[a]Some airports fell into multiple categories and thus may have already been excluded from an earlier filter. We did not double count airports.

Source: GAO's analysis.

As part of our analysis, we also grouped the nonhub airports based on the size of the surrounding areas' populations. Because many of these airports are within metropolitan statistical areas (MSAs), we used those population totals.[39] If an airport was not located within an MSA, we used the county population.

To determine what overall level of service airlines provided at the nation's small communities in 2000, we examined air service schedules published by the airlines for the week of October 15–21, 2000. As with our previous reports on changes in air fares and service,[40] the types of service we focused our analysis on were: the number of carriers serving the airport, if the airport was dominated by a single carrier,[41] the number of nonstop destinations served out of the airport, the number of hubs served out of the airport, the number of turboprop and jet departures per week out of the airport, and the types of aircraft serving the airport. We determined these air service dimensions using airline flight schedule information submitted by all U.S. airlines that we purchased from the Kiehl

[39] An MSA is a geographic entity designated by the federal Office of Management and Budget for use by federal statistical agencies. In general, an MSA is a metropolitan area with a population of 100,000 or more, often defined in terms of counties, except in New England, where MSAs are defined in terms of county subdivisions (primarily cities and towns).

[40] See, for example, U.S. General Accounting Office, *Airline Deregulation: Changes in Airfares, Service Quality, and Barriers to Entry*, GAO/RCED-99-92 (Washington, D.C.: Mar. 4, 1999). A more complete list of related GAO Products follows appendix VIII.

[41] A dominated airport was one in which a single carrier provided more than 50 percent of the total capacity at the airport (measured in terms of seats available for sale).

Hendrickson Group, an aviation consulting firm. We did not independently assess the reliability of the Kiehl Hendrickson Group's data, which it purchases from another vendor, Innovata, LLC. According to the Kiehl Hendrickson Group, Innovata employs numerous proprietary quality assurance edit checks to ensure data integrity.

To determine factors associated with those service levels, we reviewed available literature on air service and local economic development, and we interviewed industry officials, consultants, academic experts, and airport officials. Based on that information, we identified a number of factors that relate air service levels with various aspects of small communities. Among the elements identified were the population of those small communities and the proximity of small community airports to other larger airports, many of which served either as a hub for a major airline or which was served by a low-fare carrier. [42] We obtained community population data from the U.S. Bureau of the Census. In addition, we asked the airport directors at the small community airports to estimate the size of their airport's "catchment area." An airport's catchment area is the geographic area from which it draws passengers. For those who did not respond to the survey, we estimated the size of their catchment areas based on the average size of the catchment area for other small community airports in the same geographic region. We then calculated the total population living within the catchment areas using 2000 census tract population data. For each small community airport, we also identified the nearest major airline hub facility and nearest airport served by a low-fare carrier and determined the distance between those airports to the small community airport. We statistically analyzed the extent to which some of the identified factors contributed to overall service levels. That analysis is described in greater detail in appendix V.

To determine how air service has changed at small communities over time, we analyzed changes in scheduled air service for different time periods. We used our analysis of air service for the week of October 15–21, 2000 as a baseline for comparison. To minimize the possible effects of seasonality in air service, we then examined air service schedules for the week of

[42] We adopted DOT's definition of a low-fare airline and included AirTran, American Trans Air, Frontier, JetBlue, Southwest, Spirit, and Vanguard.

October 15–21, 2001.[43] To identify the service changes at small community airports that might be separately attributable to the 2001 economic downturn and the September 11 terrorist attacks, we examined two different sets of airline schedule data for October 15–21, 2001: those that airlines had published prior to September 11, 2001, and those published by the airlines following September 11, 2001. The first October 2001 schedule dataset reflected the schedule as of August 30, 2001, and is, therefore, not reflective of the airline industry's reaction to the events of September 11. The second schedule dataset for October 15–21 reflected the schedule as of October 12, 2001. Finally, to determine if airlines continued to make substantial changes to their scheduled service, we also analyzed their schedules for the week of November 1-7, 2001. We recognize that airlines make frequent changes to their service schedules, and that service at these communities may have changed since then. We analyzed the same service elements as for the week of October 15–21, 2000.

To determine factors associated with the changes in service at small community airports, we surveyed airport directors at nonhub and small hub airports. We also interviewed officials from major and commuter airlines, FAA and DOT, and industry experts. The survey responses helped us to identify the individual airport perspectives on how their service has changed and the impact of those changes, as well as the major factors affecting the service changes. We interviewed airline officials to understand how and why the major airlines were reducing and/or transferring small community airport routes to commuter carriers and how the different types of contractual relationships affect the route changes. In addition, airline officials described why many airlines are moving away from turboprop to regional jets. FAA and DOT officials, and industry experts provided further information on the state of the airline industry, particularly the vulnerability of small community airports.

Internet Survey of Airport Directors

To collect information on the operational activities of small and nonhub airports, and the opinions of their managers on a variety of issues, we conducted a Web questionnaire survey of 280 U.S. airports from December 10, 2001, through January 29, 2002.

[43] Analyses of airline service often uses data on airline schedules or operations during the months of either May or September, because those months are considered to be free of the effects of summer vacation travel or lessened travel during winter months. We could not use September data because of the effects of September 11, and we considered data for May 2001 to be too dated for our purposes.

Using data from the FAA, Kiehl Hendrickson Group, American Association of Airport Executives (AAAE), and the State of Alaska, we developed a sample of 280 small and nonhub airports. We did not survey the airport directors of all nonhub and small hub airports. Because of the special circumstances (e.g., unique remoteness) of smaller Alaska airports, we included another criterion for incorporating them into our database: We only included Alaska small and nonhubs that, in addition to meeting the prior criteria, were Part 139 certified.[44] This additional criterion resulted in a total of 20 Alaska airports being included in our survey.

We developed our survey instrument in consultation with AAAE officials, who reviewed our draft questionnaire and made suggestions about content and format. We also pretested the draft questionnaire at four airports in our study population. These airports were Bellingham International and Spokane International (Washington) and Hagerstown, Maryland, and Richmond, Virginia. We chose these airports because they represented—in terms of annual enplanements, location, and airport type—the kinds of airports that would be asked to complete our final questionnaire. We incorporated changes into our survey instrument as a result of these pretests. The final questionnaire was posted on the World Wide Web for respondents to complete. A complete reproduction of the Web survey can be viewed in Adobe Acrobat pdf format at www.gao.gov/special.pubs/d02432sv.pdf.

We sent e-mail messages or otherwise contacted airports in our survey database in late November 2001 to notify them of our survey. We then sent each airport representative a unique username and password and invited them to fill out an automated questionnaire posted on the World Wide Web in early December of 2001. About 12 percent of the airport representatives completed a paper version of the questionnaire in lieu of completing the survey on-line.

During the survey fieldwork period, we made at least three follow-up contacts with each airport that had not yet responded to ask them to participate. We used all completed responses received by January 29, 2002, in the analysis for this report. We received responses from 207 airports in which the respondent had indicated that they had completed their

[44] These regulations prescribe rules governing the certification and operation of land airports which serve any scheduled or unscheduled passenger operation of an air carrier that is conducted with an aircraft having a seating capacity of more than 30 passengers.

questionnaire and that GAO could use the data (a 74 percent response rate). Response rates did not vary appreciably across small hub and nonhub airports and results of the follow-up efforts showed no evidence that our survey results were not representative of the actual study population. Some questions in our survey instrument were not answered by all of the airports completing a useable questionnaire, but this rate of item nonresponse was generally low.

In addition to any systematic bias or random error in our survey results that may have been caused by our inability to obtain answers from all of the airports in the population on all of our questions (nonresponse error), estimates from questionnaire surveys may be subject to other sources of error. We took steps to limit these errors. We checked our sample list of airports against other sources to help ensure its completeness, we pretested our questionnaire and had experts review it, and we checked our analysis for programming errors. We did not, however, verify the answers reported by airport directors.

Other Data Limitations to Our Work

Other important issues may be relevant to an analysis of the service changes at small community airports. However, a lack of detailed information on these factors limited the scope of this review. For example, we were not able to obtain information on the differences in airfares at small communities and at competing airports. Airfare data for the quarter including October 2001 would not be available from the Bureau of Transportation Statistics until late February or early March 2002. Additionally, there is a lack of complete and representative fare data for small communities, especially for local passengers who do not connect to large carrier services. This is because public data on airfares is developed from a 10 percent sample of tickets collected from large air carriers, which comprises DOT's "Passenger Origin-Destination Survey" (O&D Survey). Small certificated air carriers and commuter carriers do not participate in the O&D Survey. Thus, there are inherent statistical sampling limitations in the O&D Survey data. In addition, airlines' decisions about profitability of operations in certain markets are proprietary confidential.

We conducted our work from April 2001 through March 2002 in accordance with generally accepted government auditing standards.

Appendix II: Small Hub Airports Tend to Have More Commercial Air Service and Were Less Affected by Airline Service Reductions

Small hub airports, the closest point of comparison to nonhubs, tend to serve somewhat larger communities and have significantly more commercial air service than do the 202 nonhub airports in the continental United States included in our analysis. The median population for small hub communities included in our analysis was about 417,000. As table 5 shows, only about 2 percent of small hub communities had service from two or fewer major carriers; the other 98 percent had service from more carriers. Additionally, only about 2 percent of small hub communities had service to three or fewer nonstop destinations; the other 98 percent had nonstop service to more locations. In addition, almost two-thirds of their nonstop destinations were into major airline hubs, and the majority of their flights were on jet aircraft (as opposed to turboprop or piston aircraft).

Table 5: Characteristics of Air Service at Nonhub and Small Hub Airports (October 2000)

Airports with:	Nonhubs	Small hubs
Service from two or fewer major carriers	72.8%	1.9%
Dominated by one carrier	84.2%	37.7%
Service to three or fewer nonstop destinations	70.7%	1.9%
Percent of total nonstop destinations that are to major airline hubs	58.7%	64.4%
Percent of daily flights that are on turboprop or piston aircraft	81.4%	37.5%

Source: GAO analysis of data from the Kiehl Hendrickson Group.

Compared to small communities with nonhub airports, the communities with small hub airports had much greater daily air service. As table 6 shows, on average, small hubs had significantly more carriers, more jet and turboprop flights, and more nonstop destination options. For example, the median small hub airport community was served by six airlines, compared with two airlines for the small communities in our analysis, and the median number of daily departures was 45, compared with 9 for small communities. Table 6 provides additional information regarding small hubs and compares key differences in the scope of air service that airlines scheduled at these two airport categories.

Table 6: Median Airline Service Levels at Nonhub and Small Hub Airports, October 2000

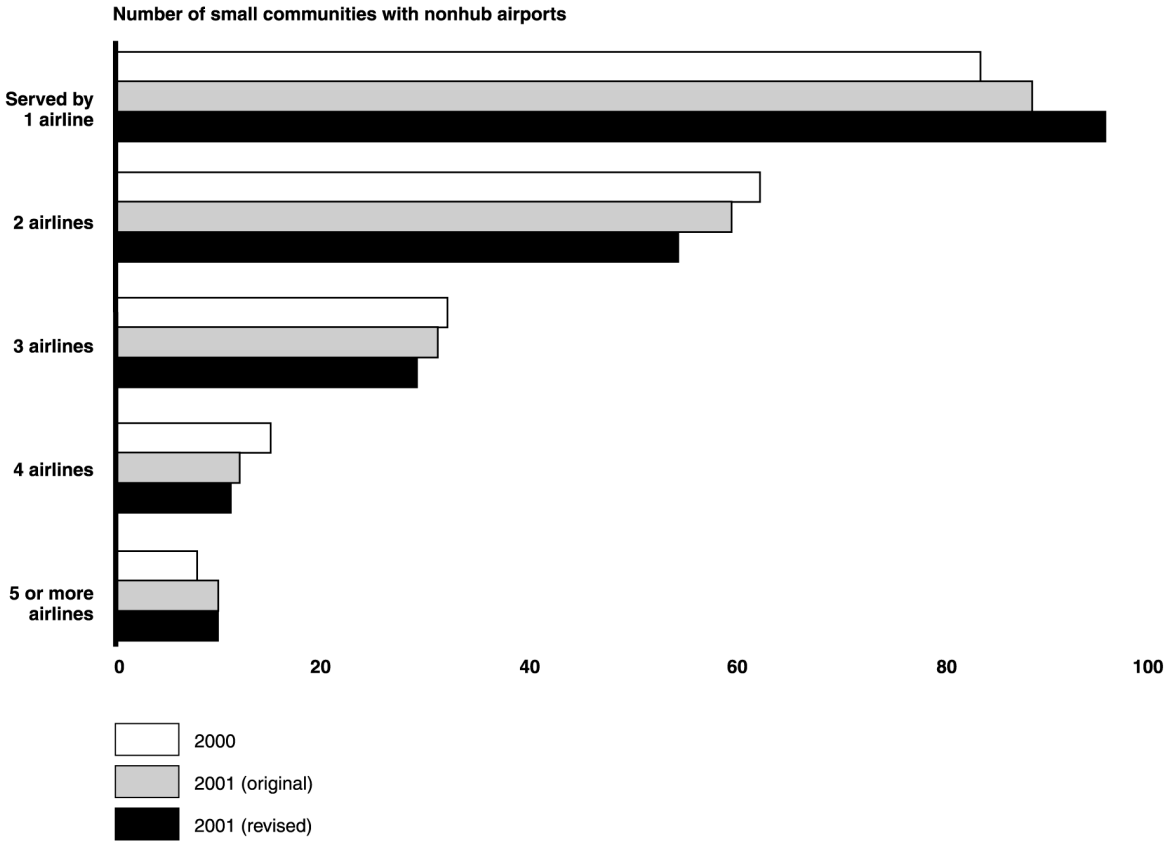
Air service dimension	Small communities (nonhub airports)	Communities with small hub airports
Airlines providing commercial service	2	6
Daily nonstop destinations	2	10
Daily nonstop destinations that are airline hubs	1	7
Daily turboprop departures	8	16
Daily jet departures	0	25
Total daily departures	9[a]	45

[a]The median number of total daily departures does not necessarily equal the sum of the median number of daily turboprop departures and the median number of daily jet departures because the median values are calculated separately for each air service dimension, and because the distribution of values in each category may not be identical.

Source: GAO analysis of data from the Kiehl Hendrickson Group.

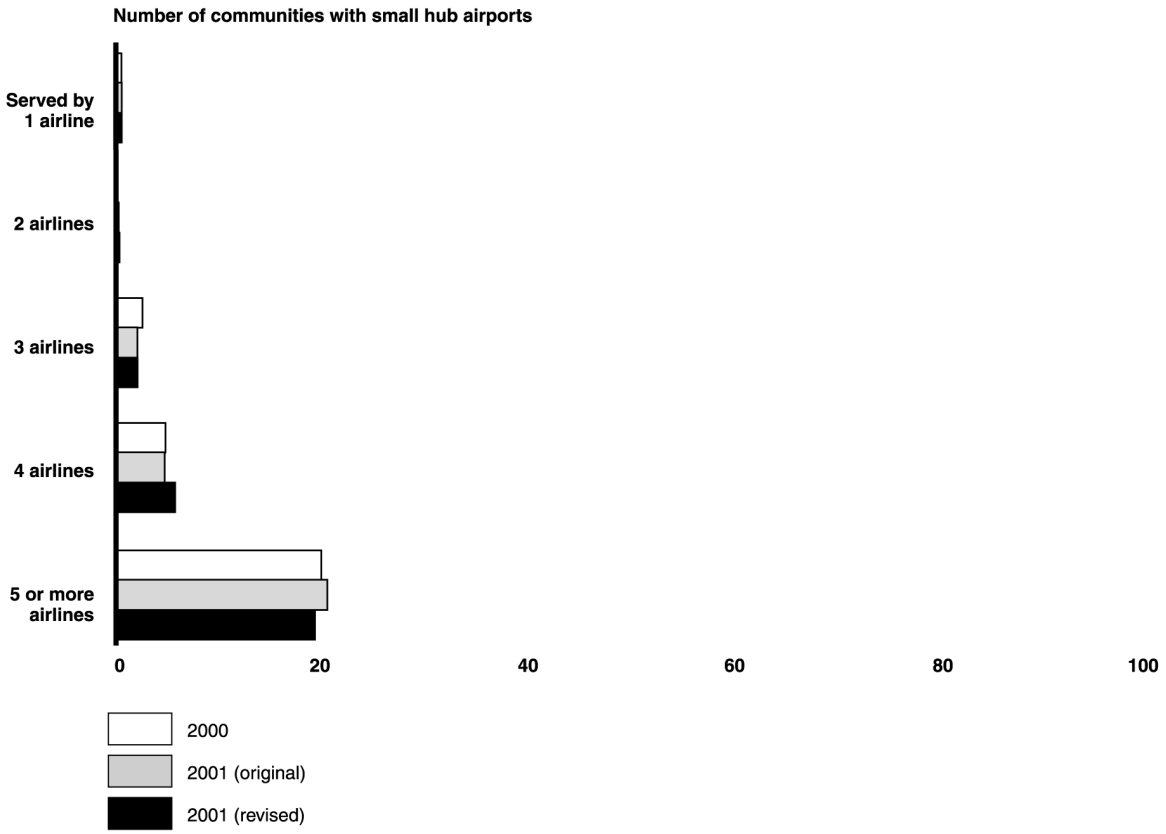
Compared to the experience of small communities, small hub airports saw relatively little change in their airline schedules during the period we analyzed. For example, there was little change in the number of small hubs that had service from three or more carriers (see figs. 8 and 9). In addition, the number of small hubs with service to more than two nonstop destinations did not change, and the number of small hubs dominated by a single carrier declined slightly.

Figure 8: Change in the Number of Airlines Serving Small Communities with Nonhub Airports, October 2000–October 2001



Source: GAO analysis of data from the Kiehl Hendrickson Group.

Figure 9: Change in the Number of Airlines Serving Communities with Small Hub Airports, October 2000–October 2001



Source: GAO analysis of data from the Kiehl Hendrickson Group.

According to other data on changes in daily scheduled seats from U.S. airports, airports of all sizes experienced generally comparable decreases in total service. Small hubs experienced a greater relative decrease in service (-15.5 percent) compared to nonhubs (-13.5 percent). Large hubs had the greatest relative decrease in total available seats (-16.3 percent), and medium hubs had a smaller decrease (-12.4 percent).

Appendix III: Change in Air Service at 202 U.S. Nonhub Airports, October 2000–October 2001

Table 7: Changes in the Number of Carriers Serving Small Community Airports and Nonstop Destinations

				Major Carriers				Number of Nonstop Destinations			
State	Community	Population (2000)	Enplanements (1999)	Oct -00	Oct-01 (original)	Oct-01 (revised)	Total Change	Oct-00	Oct-01 (original)	Oct-01 (revised)	Total Change
AL	Dothan	137,916	66,025	2	1	1	**-1**	3	1	1	**-2**
	Montgomery	333,055	231,061	4	3	3	**-1**	5	4	4	**-1**
AR	Fort Smith	207,290	102,583	3	2	2	**-1**	2	2	2	**0**
	Texarkana	129,749	46,049	2	2	2	**0**	1	1	1	**0**
	Fayetteville	311,121	320,438	5	5	5	**0**	7	9	9	**2**
AZ	Fort Huachuca Sierra	117,755	7,005	1	1	1	**0**	1	1	1	**0**
	Flagstaff	122,366	33,978	1	1	1	**0**	1	1	1	**0**
	Yuma	160,026	64,078	2	2	2	**0**	2	2	2	**0**
CA	Arcata/ Eureka	126,518	111,071	2	2	2	**0**	5	5	5	**0**
	Bakersfield	661,645	147,142	3	3	3	**0**	4	3	3	**-1**
	Chico	203,171	30,004	1	1	1	**0**	1	1	1	**0**
	Imperial	142,361	24,834	1	1	1	**0**	1	1	1	**0**
	Inyokern	661,645	9,089	1	1	1	**0**	1	1	1	**0**
	Modesto	446,997	28,314	1	1	1	**0**	1	1	1	**0**
	Monterey	401,762	258,605	3	3	3	**0**	3	3	3	**0**
	Redding	163,256	74,606	2	3	3	**1**	3	4	4	**1**
	San Luis Obispo	246,681	147,028	3	3	3	**0**	3	3	3	**0**
	Santa Maria	399,347	44,591	1	1	1	**0**	1	1	1	**0**
	Visalia	368,021	10,255	1	1	1	**0**	2	1	1	**-1**
CO	Aspen	14,872	215,685	2	2	2	**0**	2	2	2	**0**
	Durango	43,941	96,647	3	3	3	**0**	3	3	4	**1**
	Eagle	41,659	175,457	1	1	1	**0**	1	1	1	**0**
	Grand Junction	116,255	137,793	2	3	3	**1**	3	3	3	**0**
	Gunnison	13,956	57,953	1	1	1	**0**	1	1	1	**0**
	Hayden	19,690	108,797	1	1	1	**0**	1	1	1	**0**
	Montrose	33,432	70,799	2	3	3	**1**	2	3	3	**1**
	Telluride	6,594	22,483	2	1	1	**-1**	2	1	1	**-1**
FL	Naples	251,377	54,494	3	2	2	**-1**	4	3	2	**-2**
	Daytona Beach	443,343	275,231	2	2	1	**-1**	3	3	2	**-1**
	Key West	79,589	275,909	5	5	5	**0**	6	6	6	**0**
	Gainesville	217,955	152,087	2	2	2	**0**	2	2	2	**0**
	Melbourne	476,230	273,813	2	3	1	**-1**	2	6	2	**0**
	Panama City	148,217	164,426	3	3	3	**0**	5	6	6	**1**

				Major Carriers				Number of Nonstop Destinations			
State	Community	Population (2000)	Enplanements (1999)	Oct -00	Oct-01 (original)	Oct-01 (revised)	Total Change	Oct-00	Oct-01 (original)	Oct-01 (revised)	Total Change
GA	Albany	120,822	44,339	1	1	1	**0**	1	1	1	**0**
	Augusta	477,441	215,556	2	2	2	**0**	2	2	2	**0**
	Athens	153,444	11,234	1	1	1	**0**	1	1	1	**0**
	Brunswick	67,568	24,492	1	1	1	**0**	1	1	1	**0**
	Columbus	274,624	93,512	3	2	2	**-1**	4	2	2	**-2**
	Macon	322,549	30,207	1	1	1	**0**	2	2	2	**0**
	Valdosta	92,115	32,695	1	1	1	**0**	1	1	1	**0**
IA	Waterloo	128,012	58,904	3	3	3	**0**	4	4	3	**-1**
	Dubuque	89,143	55,555	3	2	2	**-1**	4	2	2	**-2**
	Fort Dodge	40,235	11,801	1	1	1	**0**	1	1	1	**0**
	Mason City	46,447	13,477	1	1	1	**0**	2	2	2	**0**
	Sioux City	124,130	89,563	2	2	2	**0**	2	2	2	**0**
ID	Idaho Falls	82,522	120,699	2	2	2	**0**	2	3	3	**1**
	Lewiston	37,410	67,041	1	1	1	**0**	2	3	3	**1**
	Pocatello	7,538	46,679	2	2	2	**0**	2	3	3	**1**
	Hailey	18,991	67,632	2	2	2	**0**	2	2	2	**0**
	Twin Falls	64,284	36,425	1	1	1	**0**	1	1	1	**0**
IL	Bloomington/ Normal	150,433	217,596	6	5	5	**-1**	6	5	5	**-1**
	Champaign/ Urbana	179,669	133,845	3	3	3	**0**	4	3	3	**-1**
	Decatur	114,706	24,989	1	1	1	**0**	1	1	1	**0**
	Peoria	347,387	219,791	4	5	5	**1**	8	8	8	**0**
	Rockford	371,236	32,608	1	0	0	**-1**	1	0	0	**-1**
	Springfield	201,437	80,755	2	4	4	**2**	3	4	4	**1**
	Quincy	68,277	11,415	2	2	2	**0**	2	2	2	**0**
IN	Evansville	171,922	257,966	5	5	5	**0**	9	8	7	**-2**
	Lafayette	182,821	19,228	2	1	1	**-1**	3	1	1	**-2**
KS	Manhattan	62,843	19,908	1	1	1	**0**	2	2	2	**0**
	Salina	53,597	15,978	2	1	1	**-1**	3	2	2	**-1**
KY	Paducah	65,514	26,300	2	2	2	**0**	4	3	2	**-2**
LA	Alexandria	126,337	116,006	4	3	3	**-1**	5	4	4	**-1**
	Lake Charles	183,577	76,263	2	2	1	**-1**	2	2	1	**-1**
	Lafayette	385,647	189,772	4	4	4	**0**	4	4	4	**0**
	Monroe	147,250	122,412	3	3	3	**0**	8	6	6	**-2**
MA	Nantucket	9,520	289,655	3	3	3	**0**	6	6	6	**0**
	Hyannis	162,582	208,508	3	3	3	**0**	4	3	4	**0**
	Vineyard Haven	14,987	73,461	2	2	2	**0**	6	6	5	**-1**
	Provincetown	162,582	15,925	1	1	1	**0**	1	1	1	**0**

				Major Carriers				Number of Nonstop Destinations			
State	Community	Population (2000)	Enplanements (1999)	Oct -00	Oct-01 (original)	Oct-01 (revised)	Total Change	Oct-00	Oct-01 (original)	Oct-01 (revised)	Total Change
MD	Cumberland	27,078	6,142	1	0	0	**-1**	2	0	0	**-2**
	Hagerstown	131,923	27,050	1	1	1	**0**	2	1	1	**-1**
	Salisbury	86,644	73,124	1	1	1	**0**	3	3	2	**-1**
MI	Alpena	31,314	10,263	1	1	1	**0**	2	2	2	**0**
	Kalamazoo	452,851	278,212	6	6	5	**-1**	6	6	5	**-1**
	Sault Ste. Marie	38,543	14,937	1	1	1	**0**	1	1	1	**0**
	Hancock	36,016	27,998	1	1	1	**0**	3	1	1	**-2**
	Escanaba	38,520	20,550	2	2	2	**0**	5	3	3	**-2**
	Saginaw	403,070	294,483	4	3	3	**-1**	5	4	4	**-1**
	Pellston	31,437	31,977	1	1	1	**0**	3	3	3	**0**
	Marquette	64,634	43,200	0	1	1	**1**	0	1	1	**1**
	Traverse City	77,654	189,809	4	4	3	**-1**	7	7	4	**-3**
MN	Bemidji	39,650	29,457	2	2	2	**0**	3	3	3	**0**
	Brainerd	55,099	19,190	1	1	1	**0**	2	2	2	**0**
	Duluth	200,528	140,835	2	2	2	**0**	2	2	3	**1**
	Grand Rapids	43,992	10,367	1	1	1	**0**	1	2	1	**0**
	Hibbing	200,528	15,709	1	1	1	**0**	1	2	1	**0**
	International Falls	14,355	22,460	1	1	1	**0**	1	1	2	**1**
	Rochester	124,277	152,492	2	3	2	**0**	2	3	2	**0**
	Thief River Falls	13,584	8,854	1	1	1	**0**	1	1	1	**0**
MO	Columbia	135,454	26,268	2	1	1	**-1**	3	1	1	**-2**
	Joplin	157,322	28,877	3	2	2	**-1**	4	2	2	**-2**
MS	Greenville	62,977	13,265	1	1	1	**0**	2	2	2	**0**
	Columbus	61,586	44,976	2	2	2	**0**	4	4	3	**-1**
	Meridian	78,161	30,991	2	2	2	**0**	4	4	4	**0**
	Hattiesburg/ Laurel	64,958	12,331	1	1	1	**0**	2	2	1	**-1**
	Tupelo	75,755	15,494	1	1	1	**0**	2	2	2	**0**
MT	Billings	129,352	338,769	5	5	5	**0**	12	12	12	**0**
	Butte	34,606	47,963	2	2	2	**0**	3	3	3	**0**
	Bozeman	67,831	223,006	4	4	4	**0**	6	5	5	**-1**
	Kalispell	74,471	146,942	4	4	4	**0**	6	6	5	**-1**
	Great Falls	80,357	138,705	4	4	4	**0**	7	7	7	**0**
	Helena	55,716	79,166	3	3	3	**0**	5	5	5	**0**
	Missoula	95,802	221,292	4	5	5	**1**	7	7	8	**1**
	West Yellowstone	67,831	4,998	0	1	0	**0**	0	2	0	**0**

				Major Carriers				Number of Nonstop Destinations			
State	Community	Population (2000)	Enplanements (1999)	Oct -00	Oct-01 (original)	Oct-01 (revised)	Total Change	Oct-00	Oct-01 (original)	Oct-01 (revised)	Total Change
NC	Asheville	225,965	283,144	2	3	3	**1**	5	6	6	**1**
	New Bern	91,436	73,882	2	2	1	**-1**	2	2	1	**-1**
	Fayetteville	302,963	157,906	2	2	2	**0**	2	2	2	**0**
	Hickory	341,851	21,532	1	1	1	**0**	1	1	1	**0**
	Wilmington	233,450	246,790	3	3	2	**-1**	4	3	2	**-2**
	Jacksonville	150,355	54,722	1	1	1	**0**	2	2	2	**0**
	Greenville	133,798	43,756	1	1	1	**0**	2	1	1	**-1**
	Pinehurst	74,769	20,238	1	1	1	**0**	1	1	1	**0**
ND	Bismarck	94,719	129,327	3	3	3	**0**	3	4	4	**1**
	Fargo	174,367	226,385	2	2	2	**0**	3	3	3	**0**
	Grand Forks	97,478	88,281	1	1	1	**0**	1	1	1	**0**
	Williston	19,761	5,613	1	2	2	**1**	1	3	3	**2**
	Minot	58,795	74,333	1	1	1	**0**	1	1	1	**0**
NE	Scottsbluff	36,951	12,219	1	1	1	**0**	1	1	1	**0**
	Grand Island	53,354	13,063	1	2	2	**1**	5	4	4	**-1**
	Lincoln	250,291	281,169	4	4	4	**0**	5	5	5	**0**
NH	Lebanon	81,743	20,152	1	1	1	**0**	2	3	3	**1**
NM	Carlsbad	51,658	7,787	2	2	2	**0**	3	3	3	**0**
	Farmington	113,801	53,538	3	4	4	**1**	3	3	4	**1**
	Hobbs	55,511	2,512	2	2	2	**0**	3	5	5	**2**
	Roswell	61,382	18,832	2	2	2	**0**	4	4	4	**0**
	Santa Fe	147,635	26,178	2	1	2	**0**	2	1	3	**1**
NV	Elko	45,291	119,295	1	1	1	**0**	2	2	2	**0**
NY	Binghamton	252,320	136,305	3	3	3	**0**	8	5	5	**-3**
	Elmira/ Corning	91,070	108,124	2	2	2	**0**	6	6	3	**-3**
	Ithaca	96,501	101,945	1	1	1	**0**	6	5	4	**-2**
	Jamestown	139,750	20,827	1	1	1	**0**	1	1	1	**0**
OH	Toledo	618,203	248,017	6	5	5	**-1**	6	5	5	**-1**
	Youngstown/ Warren	594,746	40,274	2	2	1	**-1**	4	4	3	**-1**
OK	Lawton	114,996	62,335	2	1	1	**-1**	1	1	1	**0**
OR	Klamath Falls	63,775	33,729	1	1	1	**0**	1	1	1	**0**
	Medford	181,269	224,699	2	2	2	**0**	4	4	4	**0**
	North Bend	62,779	29,886	1	1	1	**0**	1	1	1	**0**
	Pendleton	70,548	14,019	1	1	1	**0**	2	2	2	**0**
	Redmond	115,367	140,915	2	2	2	**0**	3	3	3	**0**

				Major Carriers				Number of Nonstop Destinations			
State	Community	Population (2000)	Enplanements (1999)	Oct -00	Oct-01 (original)	Oct-01 (revised)	Total Change	Oct-00	Oct-01 (original)	Oct-01 (revised)	Total Change
PA	Altoona	129,144	16,969	1	1	1	**0**	3	2	1	**-2**
	Wilkes-Barre/ Scranton	624,776	234,292	4	3	3	**-1**	9	6	4	**-5**
	Bradford	45,936	13,131	1	1	1	**0**	1	1	1	**0**
	Du Bois	45,932	17,355	1	1	1	**0**	2	2	1	**-1**
	Erie	280,843	167,507	3	2	2	**-1**	3	2	2	**-1**
	Williamsport	120,044	46,519	1	1	1	**0**	2	2	2	**0**
	Johnstown	232,621	20,899	1	1	1	**0**	2	1	2	**0**
	Lancaster	470,658	19,342	1	1	1	**0**	1	1	1	**0**
	Reading	373,638	52,519	1	1	1	**0**	2	2	2	**0**
	State College	135,758	126,945	3	3	3	**0**	5	5	5	**0**
RI	Block Island	293,566	11,190	1	1	1	**0**	1	1	1	**0**
	Westerly	293,566	12,142	1	1	1	**0**	1	1	1	**0**
SC	Florence	125,761	57,123	2	2	2	**0**	2	2	2	**0**
	Hilton Head Island	120,937	100,194	1	1	1	**0**	2	1	1	**-1**
SD	Aberdeen	35,460	25,365	1	1	1	**0**	3	3	3	**0**
	Watertown	25,897	9,324	1	1	1	**0**	1	2	2	**1**
	Pierre	16,481	18,228	2	2	2	**0**	2	3	3	**1**
	Rapid City	88,565	195,209	3	3	3	**0**	3	3	3	**0**
TN	Chattanooga	465,161	303,689	4	4	4	**0**	5	6	5	**0**
	Bristol/ Johnson/King	480,091	221,228	4	4	4	**0**	6	6	6	**0**
TX	Abilene	126,555	47,984	2	2	1	**-1**	3	2	1	**-2**
	Waco	213,517	67,045	2	2	1	**-1**	4	2	1	**-3**
	Beaumont/ Port Arthur	385,090	97,537	3	2	2	**-1**	2	2	2	**0**
	Brownsville	335,227	71,949	1	1	1	**0**	1	1	1	**0**
	College Station	152,415	93,005	2	2	2	**0**	2	2	2	**0**
	Longview	208,780	30,497	1	1	1	**0**	1	1	1	**0**
	Killeen	312,952	90,418	3	3	3	**0**	3	2	2	**-1**
	Laredo	193,117	87,739	2	2	2	**0**	2	2	2	**0**
	Mc Allen	569,463	311,237	3	3	2	**-1**	3	3	2	**-1**
	San Angelo	104,010	39,411	2	2	1	**-1**	2	2	1	**-1**
	Wichita Falls	140,518	55,903	2	1	1	**-1**	1	1	1	**0**
	Tyler	174,706	74,233	3	2	1	**-2**	3	2	1	**-2**
	Victoria	84,088	20,016	1	1	1	**0**	1	1	1	**0**
UT	St. George	90,354	33,707	2	2	2	**0**	2	3	3	**1**
VA	Charlottesville	159,576	171,150	3	4	4	**1**	6	7	7	**1**
	Lynchburg	214,911	85,822	3	3	3	**0**	4	4	4	**0**
	Staunton/ Harrisburg	65,615	16,494	2	2	2	**0**	2	2	2	**0**

				Major Carriers				Number of Nonstop Destinations			
State	Community	Population (2000)	Enplanements (1999)	Oct -00	Oct-01 (original)	Oct-01 (revised)	Total Change	Oct-00	Oct-01 (original)	Oct-01 (revised)	Total Change
WA	Walla Walla	55,180	31,166	1	1	1	**0**	1	1	1	**0**
	Bellingham	166,814	97,406	2	2	2	**0**	1	1	1	**0**
	Port Angeles	64,525	28,201	1	1	1	**0**	2	1	1	**-1**
	Wenatchee	32,603	52,855	1	1	1	**0**	2	1	1	**-1**
	Pasco	191,822	206,105	3	3	3	**0**	6	4	4	**-2**
	Pullman/ Moscow, ID	40,740	34,887	1	1	1	**0**	2	2	2	**0**
	Yakima	222,581	89,569	2	2	2	**0**	1	1	1	**0**
WI	Appleton	358,365	266,629	4	4	4	**0**	8	6	6	**-2**
	Mosinee	125,834	142,980	3	3	3	**0**	6	6	6	**0**
	Eau Claire	148,337	20,611	1	1	1	**0**	2	2	2	**0**
	La Crosse	126,838	113,640	3	3	3	**0**	4	4	4	**0**
	Rhinelander	36,776	38,651	2	1	1	**-1**	5	2	2	**-3**
WV	Clarksburg	68,652	16,276	1	2	2	**1**	2	4	3	**1**
	Charleston	251,662	266,679	5	5	5	**0**	11	11	10	**-1**
	Huntington	42,903	62,609	2	2	2	**0**	3	3	3	**0**
	Lewisburg	34,453	12,771	1	2	2	**1**	4	4	3	**-1**
	Morgantown	81,866	21,561	1	1	1	**0**	3	3	2	**-1**
	Parkersburg	151,237	25,677	1	1	1	**0**	1	1	1	**0**
WY	Cody	25,786	28,326	2	2	2	**0**	2	2	2	**0**
	Casper	66,533	66,184	2	2	2	**0**	2	2	2	**0**
	Cheyenne	81,607	20,520	1	1	1	**0**	1	1	1	**0**
	Gillette	33,698	15,356	1	1	1	**0**	1	1	1	**0**
	Jackson	18,251	165,595	2	2	2	**0**	2	2	2	**0**
	Riverton	35,804	13,327	1	1	1	**0**	2	2	2	**0**
	Sheridan	26,560	15,052	1	1	1	**0**	1	1	1	**0**

Source: GAO analysis of data from U.S. Census Bureau, Federal Aviation Administration, and Kiehl Hendrickson Group.

Table 8: Changes in the Average Number of Daily Turboprop and Jet Departures at Small Communities

		Daily turboprop departures				Daily jet departures			
State	Community	Oct-00	Oct-01 (original)	Oct-01 (revised)	Total turboprop change	Oct-00	Oct-01 (original)	Oct-01 (revised)	Total jet change
AL	Dothan	12	3	7	**-5**	0	4	0	**0**
	Montgomery	13	10	10	**-3**	6	10	9	**3**
AR	Fort Smith	13	13	11	**-2**	2	1	1	**-1**
	Texarkana	10	10	9	**-1**	1	1	1	**0**
	Fayetteville	13	13	12	**-1**	13	13	13	**0**
AZ	Fort Huachuca Sierra	4	4	3	**-1**	0	0	0	**0**
	Flagstaff	8	6	5	**-3**	0	0	0	**0**
	Yuma	13	13	10	**-3**	0	0	0	**0**
CA	Arcata/Eureka	13	13	13	**0**	0	0	0	**0**
	Bakersfield	13	13	13	**0**	4	3	2	**-2**
	Chico	6	6	5	**-1**	0	0	0	**0**
	Imperial	6	6	6	**0**	0	0	0	**0**
	Inyokern	4	4	4	**0**	0	0	0	**0**
	Modesto	6	6	5	**-1**	0	0	0	**0**
	Monterey	13	13	13	**0**	4	4	3	**-1**
	Redding	12	13	12	**0**	0	0	0	**0**
	San Luis Obispo	13	13	13	**0**	0	0	0	**0**
	Santa Maria	10	8	8	**-2**	0	0	0	**0**
	Visalia	5	4	3	**-2**	0	0	0	**0**
CO	Aspen	3	2	2	**-1**	6	7	5	**-1**
	Durango	12	12	12	**0**	3	1	1	**-2**
	Eagle	7	1	1	**-6**	0	2	2	**2**
	Grand Junction	13	13	13	**0**	0	1	1	**1**
	Gunnison	7	4	4	**-3**	0	0	0	**0**
	Hayden	7	7	6	**-1**	0	0	0	**0**
	Montrose	8	8	6	**-2**	0	1	1	**1**
	Telluride	5	5	5	**0**	0	0	0	**0**
FL	Naples	12	10	8	**-4**	0	0	0	**0**
	Daytona Beach	1	1	1	**0**	8	9	9	**1**
	Key West	13	13	13	**0**	0	0	0	**0**
	Gainesville	7	7	7	**0**	5	5	5	**0**
	Melbourne	1	1	1	**0**	9	13	9	**0**
	Panama City	13	13	13	**0**	1	1	1	**0**

		Daily turboprop departures				Daily jet departures			
State	Community	Oct-00	Oct-01 (original)	Oct-01 (revised)	Total turboprop change	Oct-00	Oct-01 (original)	Oct-01 (revised)	Total jet change
GA	Albany	8	1	6	**-2**	0	4	0	**0**
	Augusta	13	13	12	**-1**	3	4	4	**1**
	Athens	4	4	4	**0**	0	0	0	**0**
	Brunswick	5	5	5	**0**	0	0	0	**0**
	Columbus	13	12	12	**-1**	0	0	0	**0**
	Macon	7	7	7	**0**	1	1	1	**0**
	Valdosta	7	7	7	**0**	0	0	0	**0**
IA	Waterloo	13	13	12	**-1**	0	0	0	**0**
	Dubuque	12	3	4	**-8**	0	4	4	**4**
	Fort Dodge	5	5	3	**-2**	0	0	0	**0**
	Mason City	9	9	5	**-4**	0	0	0	**0**
	Sioux City	12	11	9	**-3**	2	3	3	**1**
ID	Idaho Falls	10	5	5	**-5**	5	10	10	**5**
	Lewiston	10	10	8	**-2**	0	1	1	**1**
	Pocatello	10	6	6	**-4**	0	4	3	**3**
	Hailey	10	11	11	**1**	0	0	0	**0**
	Twin Falls	6	6	6	**0**	0	0	0	**0**
IL	Bloomington/Normal	13	13	13	**0**	8	9	9	**1**
	Champaign/Urbana	13	11	8	**-5**	4	5	5	**1**
	Decatur	5	4	3	**-2**	0	0	0	**0**
	Peoria	13	13	13	**0**	11	12	11	**0**
	Rockford	5	1	1	**-4**	0	0	0	**0**
	Springfield	13	13	13	**0**	0	0	0	**0**
	Quincy	7	7	6	**-1**	0	0	0	**0**
	Evansville	13	13	13	**0**	11	13	13	**2**
IN	Lafayette	8	3	3	**-5**	0	0	0	**0**
	Manhattan	8	8	6	**-2**	0	0	0	**0**
KS	Salina	7	5	4	**-3**	0	0	0	**0**
KY	Paducah	9	8	7	**-2**	0	0	0	**0**
	Alexandria	13	13	13	**0**	0	0	0	**0**
LA	Lake Charles	11	10	7	**-4**	0	0	0	**0**
	Lafayette	13	13	13	**0**	2	3	2	**0**
	Monroe	10	9	8	**-2**	6	6	6	**0**
	Nantucket	13	13	13	**0**	0	0	0	**0**
MA	Hyannis	13	13	13	**0**	0	0	0	**0**
	Vineyard Haven	13	13	13	**0**	0	0	0	**0**
	Provincetown	6	7	7	**1**	0	0	0	**0**
	Cumberland	5	1	1	**-4**	0	0	0	**0**
MD	Hagerstown	7	6	5	**-2**	0	0	0	**0**
	Salisbury	13	12	11	**-2**	0	0	0	**0**

State	Community	Daily turboprop departures				Daily jet departures			
		Oct-00	Oct-01 (original)	Oct-01 (revised)	Total turboprop change	Oct-00	Oct-01 (original)	Oct-01 (revised)	Total jet change
MI	Alpena	7	9	5	**-2**	0	0	0	**0**
	Kalamazoo	13	13	12	**-1**	13	13	13	**0**
	Sault Ste. Marie	4	5	3	**-1**	0	0	0	**0**
	Hancock	8	5	5	**-3**	0	0	0	**0**
	Escanaba	9	7	6	**-3**	0	0	0	**0**
	Saginaw	9	5	4	**-5**	13	13	13	**0**
	Pellston	9	9	7	**-2**	0	0	0	**0**
	Marquette	1	1	1	**0**	0	1	1	**1**
	Traverse City	13	13	9	**-4**	6	10	9	**3**
MN	Bemidji	10	10	8	**-2**	0	0	0	**0**
	Brainerd	9	7	5	**-4**	0	0	0	**0**
	Duluth	3	3	4	**1**	10	10	8	**-2**
	Grand Rapids	4	4	3	**-1**	0	0	0	**0**
	Hibbing	4	3	3	**-1**	0	0	0	**0**
	International Falls	3	3	4	**1**	0	0	0	**0**
	Rochester	4	4	3	**-1**	10	13	9	**-1**
	Thief River Falls	2	2	2	**0**	0	0	0	**0**
	Columbia	7	6	4	**-3**	5	0	0	**-5**
MO	Joplin	7	7	6	**-1**	4	0	0	**-4**
MS	Greenville	5	5	4	**-1**	0	0	0	**0**
	Columbus	13	12	11	**-2**	1	2	2	**1**
	Meridian	13	13	12	**-1**	0	0	0	**0**
	Hattiesburg/Laurel	4	4	3	**-1**	0	0	0	**0**
	Tupelo	6	7	7	**1**	0	0	0	**0**
MT	Billings	13	13	13	**0**	13	13	13	**0**
	Butte	1	1	1	**0**	7	7	7	**0**
	Bozeman	3	2	2	**-1**	10	12	12	**2**
	Kalispell	6	4	4	**-2**	7	7	7	**0**
	Great Falls	6	5	5	**-1**	11	10	11	**0**
	Helena	7	7	6	**-1**	6	6	5	**-1**
	Missoula	5	2	2	**-3**	12	13	13	**1**
	West Yellowstone	1	1	1	**0**	0	1	0	**0**
NC	Asheville	13	13	13	**0**	8	10	10	**2**
	New Bern	13	13	7	**-6**	0	0	0	**0**
	Fayetteville	9	13	13	**4**	6	3	2	**-4**
	Hickory	7	6	5	**-2**	0	0	0	**0**
	Wilmington	13	13	11	**-2**	8	7	5	**-3**
	Jacksonville	6	7	6	**0**	0	0	0	**0**
	Greenville	9	8	6	**-3**	0	0	0	**0**
	Pinehurst	6	6	4	**-2**	0	0	0	**0**

		Daily turboprop departures				Daily jet departures			
State	Community	Oct-00	Oct-01 (original)	Oct-01 (revised)	Total turboprop change	Oct-00	Oct-01 (original)	Oct-01 (revised)	Total jet change
ND	Bismarck	7	8	7	**0**	4	4	3	**-1**
	Fargo	2	2	2	**0**	13	13	12	**-1**
	Grand Forks	4	4	3	**-1**	4	4	3	**-1**
	Williston	3	5	5	**2**	0	0	0	**0**
	Minot	1	1	1	**0**	4	3	3	**-1**
NE	Scottsbluff	5	5	4	**-1**	0	0	0	**0**
	Grand Island	8	7	7	**-1**	0	0	0	**0**
	Lincoln	10	7	7	**-3**	8	13	12	**4**
NH	Lebanon	8	8	6	**-2**	0	0	0	**0**
NM	Carlsbad	5	5	5	**0**	0	0	0	**0**
	Farmington	13	13	13	**0**	0	0	0	**0**
	Hobbs	4	5	5	**1**	0	0	0	**0**
	Roswell	9	8	8	**-1**	0	0	0	**0**
	Santa Fe	13	11	10	**-3**	0	0	0	**0**
NV	Elko	12	11	11	**-1**	0	0	0	**0**
NY	Binghamton	13	13	13	**0**	2	3	3	**1**
	Elmira/Corning	13	13	9	**-4**	4	4	4	**0**
	Ithaca	13	13	12	**-1**	4	3	3	**-1**
	Jamestown	7	6	4	**-3**	0	0	0	**0**
	Toledo	13	10	8	**-5**	13	13	13	**0**
OH	Youngstown/Warren	9	5	4	**-5**	0	0	0	**0**
OK	Lawton	12	8	7	**-5**	0	0	0	**0**
OR	Klamath Falls	5	5	4	**-1**	0	0	0	**0**
	Medford	13	13	13	**0**	4	4	4	**0**
	North Bend	5	5	4	**-1**	0	0	0	**0**
	Pendleton	6	6	5	**-1**	0	0	0	**0**
	Redmond	13	13	13	**0**	0	0	0	**0**
PA	Altoona	7	6	4	**-3**	0	0	0	**0**
	Wilkes-Barre/Scranton	13	9	7	**-6**	11	10	10	**-1**
	Bradford	6	5	4	**-2**	0	0	0	**0**
	Du Bois	6	6	5	**-1**	0	0	0	**0**
	Erie	13	7	5	**-8**	4	6	5	**1**
	Williamsport	11	11	7	**-4**	0	0	0	**0**
	Johnstown	6	6	5	**-1**	0	0	0	**0**
	Lancaster	5	5	4	**-1**	0	0	0	**0**
	Reading	11	11	6	**-5**	0	0	0	**0**
	State College	13	13	13	**0**	0	0	0	**0**
RI	Block Island	9	9	9	**0**	0	0	0	**0**
	Westerly	9	9	9	**0**	0	0	0	**0**
SC	Florence	12	13	11	**-1**	0	0	0	**0**
	Hilton Head Island	12	12	12	**0**	0	0	0	**0**

		Daily turboprop departures				Daily jet departures			
State	Community	Oct-00	Oct-01 (original)	Oct-01 (revised)	Total turboprop change	Oct-00	Oct-01 (original)	Oct-01 (revised)	Total jet change
SD	Aberdeen	13	9	8	**-5**	0	0	0	**0**
	Watertown	4	4	4	**0**	0	0	0	**0**
	Pierre	7	6	5	**-2**	0	0	0	**0**
	Rapid City	10	6	4	**-6**	8	10	9	**1**
TN	Chattanooga	13	13	12	**-1**	13	13	13	**0**
	Bristol/Johnson/King	13	13	13	**0**	7	4	4	**-3**
TX	Abilene	11	10	6	**-5**	1	2	2	**1**
	Waco	12	12	8	**-4**	0	0	0	**0**
	Beaumont/Port Arthur	13	13	13	**0**	0	0	0	**0**
	Brownsville	4	3	4	**0**	3	4	3	**0**
	College Station	13	13	13	**0**	0	0	0	**0**
	Longview	6	6	5	**-1**	0	0	0	**0**
	Killeen	13	13	13	**0**	0	0	0	**0**
	Laredo	11	11	10	**-1**	0	0	0	**0**
	Mc Allen	2	1	1	**-1**	10	9	8	**-2**
	San Angelo	11	10	6	**-5**	0	0	0	**0**
	Wichita Falls	11	7	6	**-5**	0	0	0	**0**
	Tyler	13	13	9	**-4**	0	0	0	**0**
	Victoria	5	5	4	**-1**	0	0	0	**0**
UT	St. George	8	10	10	**2**	0	0	0	**0**
VA	Charlottesville	13	13	13	**0**	2	3	3	**1**
	Lynchburg	13	13	13	**0**	0	0	0	**0**
	Staunton/Harrisburg	10	9	6	**-4**	0	0	0	**0**
WA	Walla Walla	6	5	4	**-2**	0	0	0	**0**
	Bellingham	13	13	12	**-1**	0	0	0	**0**
	Port Angeles	9	5	4	**-5**	0	0	0	**0**
	Wenatchee	9	8	6	**-3**	0	0	0	**0**
	Pasco	13	13	13	**0**	5	5	5	**0**
	Pullman/Moscow, ID	6	6	5	**-1**	0	1	1	**1**
	Yakima	13	13	11	**-2**	0	0	0	**0**
WI	Appleton	13	11	8	**-5**	13	13	13	**0**
	Mosinee	13	13	13	**0**	1	2	2	**1**
	Eau Claire	9	9	7	**-2**	0	0	0	**0**
	La Crosse	9	9	7	**-2**	8	8	6	**-2**
	Rhinelander	11	5	5	**-6**	0	0	0	**0**

		Daily turboprop departures				Daily jet departures			
State	Community	Oct-00	Oct-01 (original)	Oct-01 (revised)	Total turboprop change	Oct-00	Oct-01 (original)	Oct-01 (revised)	Total jet change
WV	Clarksburg	8	8	5	**-3**	0	1	1	**1**
	Charleston	13	13	13	**0**	13	13	13	**0**
	Huntington	13	13	12	**-1**	0	0	0	**0**
	Lewisburg	4	3	3	**-1**	1	2	2	**1**
	Morgantown	12	10	7	**-5**	0	0	0	**0**
	Parkersburg	8	8	6	**-2**	0	0	0	**0**
WY	Cody	6	7	7	**1**	0	0	0	**0**
	Casper	12	12	9	**-3**	1	1	1	**0**
	Cheyenne	10	7	6	**-4**	0	0	0	**0**
	Gillette	6	5	4	**-2**	0	0	0	**0**
	Jackson	11	11	11	**0**	2	1	1	**-1**
	Riverton	8	7	7	**-1**	0	0	0	**0**
	Sheridan	5	4	4	**-1**	0	0	0	**0**

Note: [a]Average daily departures calculated by dividing total weekly departures by 7 and rounding result to nearest integer.

Source: GAO analysis of data from the Kiehl Hendrickson Group.

Appendix IV: Changes in Air Service at Small Communities in Alaska and Hawaii

Unique conditions affecting air service in Alaska and Hawaii required us to look at these two states separately from the rest of the United States. Both states have distinctive geographies: they are both located outside the continental United States and both have unique topographies that require air service to be used as a major source of intrastate travel.

We examined air service at 63 nonhub airports in Alaska and 2 in Hawaii. All of the Alaska airports were located in communities with less than 100,000 population; the median population was 7,208. The median passenger enplanements in 1999 was 5,176 (about 14 per day). The two Hawaii airports were located in larger communities; the average population was 128,094. Their median enplanements in 1999 were 108,258 (about 297 per day).

There was little change in air service at the small community airports in Alaska and Hawaii between October 2000 and October 2001 (revised), as the median level of service represented by the indicators below show (see table 9). None of these airports had nonstop service to a major airline network's hub. (The major U.S. airlines do not operate hubs in either state.) From October 2000 to October 2001 (revised), the number of these airports that were dominated by a single airline increased slightly, from 65 percent to 69 percent.

Table 9: Median Number of Carriers, Nonstop Destinations Served, Daily Turboprop and Jet Departures for Nonhub Airports in Alaska and Hawaii

Time frame	Number of carriers	Nonstop destinations served	Daily turboprop departures	Daily jet departures
October 2000	3	3	6	0
October 2001 (original)	3	3	6	0
October 2001 (revised)	3	3	6	0

Source: GAO analysis of airline schedule data from the Kiehl Hendrickson Group.

There are two communities that are categorized as small hubs in Alaska—Juneau and Fairbanks—and three in Hawaii—Hilo, Kailua/Kona, and Lihue. The Alaska airports were all located in communities with populations less than 100,000 and had no service to an airline hub. Hawaii's small hubs were in communities with populations of less than 250,000. Two of those communities had service to two airline hubs (San Francisco International and Los Angeles International).

Small hub airports in Alaska and Hawaii have notably more passenger traffic and air service than the states' nonhubs. The median passenger enplanements in the two Alaska airports in 1999 were 385,470 (about 1,056 per day), and the median passenger enplanements in Hawaii were 1,271,744 (about 3,484 per day). Typically, Alaska and Hawaii small hubs received service from four major or independent carriers with service to seven nonstop destinations. In addition, small hubs typically had 213 jet departures per week (30 jet departures per day) in October 2000.

Generally, the overall amount of service for these small hub airports declined between October 2000 and October 2001. Specifically, airlines scheduled 50 fewer weekly jet departures (eight per day), and added 8 additional weekly turboprop departures (one per day). See table 10.

Table 10: Median Number of Carriers Serving, Nonstop Destinations Served, Daily Turboprop and Jet Departures for Small Hub Airports in Alaska and Hawaii

Time frame	Number of carriers	Nonstop destinations served	Daily turboprop departures	Daily jet departures
October 2000	5	7	2	30
October 2001 (original)	4	6	0	27
October 2001 (revised)	4	7	3	22

Note: Numbers are rounded to the nearest integer.

Source: GAO analysis of airline schedule data from the Kiehl Hendrickson Group.

Appendix V: Economic Factors Affect Air Service in Small Communities

To examine the factors associated with air service in small communities in October 2000, we statistically analyzed certain economic characteristics of these communities. Our process and the outcomes of our analysis are outlined below.

Regression Model

For this study, we used regression analysis to explore which factors, called independent variables, explain differences in the level of service, called the dependent variable, in small communities in October 2000. A regression model is a statistical tool that enables researchers to investigate relationships between the dependent variable and the independent variables.

To examine the factors associated with the level of air service provided to small communities in October 2000, we used an ordinary least squares regression model. We developed several models, looking at the contribution of each independent variable to the predictive ability of the models, and the overall explanatory power of the models as measured by the coefficient of determination, or r-squared. R-squared is a measure of the proportion of the total variation in the dependent variable that can be explained by the independent variables in that particular model.

Economic Principles

Economic principles indicate that as income, market population, and the price of substitute service increase, demand for a service will increase. Under these conditions, within a competitive marketplace, as passenger demand increases, the supply of air service will increase to meet that demand. We, therefore, expect that communities with greater levels of income and gross regional product[45] and larger populations and employment levels will experience more substantial air service. Likewise, we expect that communities that are farther from an airport with a low-fare carrier will realize better service.[46]

[45] Regional product is a concept similar to gross domestic product (i.e., the output of goods and services produced by labor and property located in the United States), only measured at the regional level.

[46] We were unable to obtain data on airfares and the cost of alternative modes of air travel. However, as the distance to an alternative carrier increases, the cost of gaining access to the carrier also increases. In our analysis, we include the minimum distance to a low-fare carrier as a substitute measure for the price of alternative travel.

Data

We obtained the economic data used in the regression analysis from the Regional Economic Information System database produced by the Bureau of Economic Analysis. The data were collected for October 1999 at the county level.[47] We then created a dataset containing variables for each county, including population, total employment, manufacturing earnings, and per capita income. We merged this dataset with the data on air service and the distance between airports to create a final working dataset for this analysis. Table 11 summarizes the descriptive statistics of the economic variables and other factors for the 202 small communities in our analysis.

Table 11: Characteristics of 202 Small Communities Included in Economic Analysis

Variable	Mean	Minimum	Maximum
Employment (full- and part-time jobs)	77,558	5,397	309,598
Manufacturing earnings	$344,579	$3,403	$2,573,390
Minimum distance to a low-fare carrier airport (miles)	128	0	546
Per capita income	$25,147	$13,339	$65,573
Population	126,813	5,464	642,495
Number of jet departures per week (October 2000)	15.50	0	183
Number of turboprop departures per week (October 2000)	67.88	0	437
Number of major carriers serving communities (October 2000)	2.01	0	6
Number of nonstop destinations served (October 2000)	2.94	0	12

Source: GAO analysis of data from the Bureau of Economic Analysis.

Variables Used in the Model

We used employment and population to represent the size of a community and per capita income as a measure of income. We expect that a community with a larger manufacturing sector will have a greater demand for business travel. However, data on business travel and regional exports were unavailable for this study. In addition, it is difficult to obtain data on gross regional product (a measure similar to gross domestic product that is applied at the regional level). Therefore, for the purposes of our analysis, we used manufacturing earnings to represent the level of export activity from a region and, hence, as an indicator of the possible demand for business travel.

[47] 1999 was the most recent year for which regional economic data on earnings and per capita income were available.

Model Specification

Using the regression to explain variation in air service, we focused primarily on modeling the number of weekly departures (jet and turboprop) from a small community.[48] Multiple univariate and multivariate models of jet and turboprop departures were specified as a function of the independent variables to examine the consistency and robustness of the findings. The results of a final model are discussed below, in which jet and turboprop departures are specified as a function of employment (or population), manufacturing earnings, minimum distance to a low-fare carrier, and per capita income.[49]

Results

The results of our regression models indicate that, as expected, employment (or population), manufacturing earnings, minimum distance from a low-fare carrier, and per capita income had a positive effect on the level of air service received by a small community. Below are quantitative statistics from specific models.[50]

- After controlling for distance to a low-fare carrier, manufacturing earnings, and population, we found that for every additional $5,000 in per capita income, a community received 3.3 and 12.7 more jet and turboprop[51]

[48] Models using the number of major carriers and the percentage of total seats available on jets as dependent variables were also estimated. In general, we found that employment, per capita income, population, and distance from a low-fare carrier positively affected the number of major carriers serving a community and the percentage of total seats served by jets.

[49] The employment and population variables are highly collinear. Therefore, to avoid biased parameter estimates due to multicollinearity, ordinary least squares regression models include only one of the two factors as independent variables.

[50] The quantitative data discussed are all statistically significant at (at least) the 95 percent level. Only 200 observations were included in the regression analysis because two small communities did not have service in October 2000.

[51] Two separate regressions were estimated using jet and turboprop departures as the dependent variables. Results are similar when the employment variable is substituted for the population variable – 2.6 more jet and 12.2 turboprop departures per week, respectively. These results are statistically significant at least at the 90 percent level.

departures per week, respectively.[52] In other words, if two small communities, A and B, were identical in every way except that Community A had $5,000 more in per capita income than Community B, then Community A had roughly 16 more total departures per week than Community B. This difference in the number of total departures was attributable to the difference in per capita income.

- After controlling for distance to a low-fare carrier, manufacturing earnings, and per capita income, we found that a community received 4.3 and 4.8 more jet and turboprop departures per week respectively for every additional 25,000 jobs in the community.
- After controlling for distance to a low-fare carrier, population, and per capita income, we found that a community with $250,000 more in manufacturing earnings received 4.8 more jet departures per week than an otherwise similar community.
- After controlling for manufacturing earnings, per capita income, and employment, we found that a community received 4.7 more jet departures per week for every additional 50 miles separating the airport from a low-fare carrier.[53]

[52] The value of the coefficients of determination in all regression models (R-squared) were consistently below 0.20, denoting that the independent variables explain less than 20 percent of the variation in air service to the communities. As noted previously, airlines decide to provide service to these small communities on a market-by-market basis using individual market data not available for our study. Through our use of regression analysis, we are attempting to describe service generally across the different communities using limited aggregate data. While the data restrict our analysis to modeling broadly defined differences in air service, we do not believe that those data limitations detract from the findings.

[53] Our findings also revealed that a community that is 50 miles from an airport with a low-fare carrier loses 5.0 turboprop departures per week—resulting in a net loss of departures.

Appendix VI: Changes in Air Service at Small Communities Made By Express Airlines I and Mesaba Between 2000 and 2001

According to our analysis, between October 2000 and October 2001, Express Airlines I and Mesaba altered service at 60 small communities. Overall, more small communities lost service than gained service from these carriers during this period. A total of 49 small communities lost service, 4 of which (Bismarck, North Dakota; Columbus, Georgia; Dothan, Alabama; and Rockford, Illinois) lost all nonstop service from Express Airlines I and Mesaba.[54] On the other hand, 11 communities gained service. Nine gained additional flights or extra capacity (i.e., number of seats available for purchase) through larger aircraft, and two (Charlottesville, Virginia, and Springfield, Illinois) gained start-up service from the two airlines.

- Express Airlines I made service changes at 27 small communities between 2000 and 2001. Of these 27 communities, Express Airlines I reduced service at 13, increased service at 13, and took mixed actions at 1 other (reducing the number of daily departures but adding more available seating capacity by using larger aircraft).
- Mesaba altered its weekly service at 44 small communities between 2000 and 2001. Mesaba ended all service to 2 communities. At 37 other communities, Mesaba's service reductions averaged two departures per day per community. On the other hand, Mesaba increased service at 3 small communities and launched new service at another. At Sioux City, Iowa, Mesaba decreased average daily departures but increased total seating capacity by substituting larger aircraft.
- Eleven communities were served by both—Mesaba and Express Airlines I. Service reductions that Mesaba made at 8 of the 11 were offset by service additions from Express Airlines I, often with new regional jet service.

Table 12 summarizes the small community service changes made by Express Airlines I and Mesaba between October 2000 and October 2001.

[54] Northwest maintains mainline service at Bismarck.

Table 12: Nonstop Air Service Changes for Communities Served by Mesaba and Express Airlines I Between October 2000 and October 2001

Lost all service (4)		Lost capacity (45)		Gained capacity (9)	Gained new service (2)
Columbus, GA (Express Airlines I)	Appleton, WI (Mesaba)[a]	Alpena, MI (Mesaba, Express Airlines I)	Hibbing, MN (Mesaba)	Mosinee, WI (Express Airlines I)[a]	Springfield, IL (Express Airlines I)
Dothan, AL (Express Airlines I)	Kalamazoo, MI (Mesaba)[a]	Binghamton, NY (Mesaba)	La Crosse, WI (Mesaba)	Lincoln, NE (Express Airlines I)[a]	Charlottesville, VA (Mesaba)
Bismarck, ND (Mesaba)	Bloomington, IL (Mesaba)[a]	Bemidji, MN (Mesaba)	Mason City, IA (Mesaba)	Saginaw, MI (Express Airlines I/ Mesaba)[b]	
Rockford, IL (Mesaba, Express Airlines I)	Alexandria, LA (Express Airlines I)	Brainerd, MN (Mesaba)	Peoria, IL (Mesaba)	Sioux City, IA (Express Airlines I/ Mesaba)[d]	
	Chattanooga, TN (Express Airlines I)	Sault Ste. Marie, MI (Mesaba)	Pierre, SD (Mesaba)	Joplin, MO (Express Airlines I)	
	Evansville, IN (Mesaba)[a, e]	Champaign, IL (Mesaba)	Pellston, MI (Mesaba)	Montgomery, AL (Express Airlines I)[d]	
	Fort Smith, AR (Express Airlines I)	Hancock, MI (Mesaba)	Rhinelander, WI (Mesaba)	Tupelo, MS (Express Airlines I)	
	Greenville, MS (Express Airlines I)	Charleston, WV (Mesaba)	Rochester, MN (Mesaba)	Duluth, MN (Mesaba)	
	Columbus, MS (Express Airlines I)	Eau Claire, WI (Mesaba)	Toledo, OH (Mesaba)[a]	International Falls, MN (Mesaba)	
	Lafayette, LA (Express Airlines I)	Elmira, NY (Mesaba)	Traverse City, MI (Mesaba)[a]		
	Monroe, LA (Express Airlines I)	Erie, PA (Mesaba)	Fayetteville, AR (Express Airlines I, Mesaba)[c]		
	Paducah, KY (Express Airlines I)	Escanaba, MI (Mesaba)	State College, PA (Mesaba)		
	Panama City, FL (Express Airlines I)	Fort Dodge, IA (Mesaba)	Waterloo, IA (Mesaba)		
	Hattiesburg, MS (Express Airlines I)	Grand Forks, ND (Mesaba)	Watertown, SD (Mesaba)		
	Aberdeen, SD (Mesaba)	Grand Rapids, MN (Mesaba)	Fargo, ND (Mesaba)		

[a]Communities where Express Airlines I replaced Mesaba service.

[b]Communities where both Express Airlines I and Mesaba increased service.

[c]Communities where Express Airlines I discontinued all service, while Mesaba decreased service.

[d]Community where carriers decreased frequency, but increased capacity.

[e]Community where carrier decreased frequency, but experienced no net change in seat capacity.

Source: GAO analysis of airline schedule data from the Kiehl Hendrickson Group.

Appendix VII: Changes in Air Service at Small Communities Made By Great Lakes Aviation and Air Wisconsin Between 2000 and 2001

Of the 202 small communities in our study, Great Lakes Aviation served 16, Air Wisconsin served 15, and both airlines served 9. Both airlines served United's Chicago (O'Hare) and Denver hubs. Between October 2000 and October 2001, Great Lakes and Air Wisconsin altered air service in 39 communities. Of the 39 communities with service changes, 4 lost all of their air service (all of which was provided by Great Lakes). A total of 30 communities saw reductions in their service (i.e., capacity, either through a reduction in departures or by using smaller aircraft) by Great Lakes or Air Wisconsin. Five of the communities in our analysis gained either new service or capacity (i.e., number of seats available for purchase).

- Great Lakes altered its weekly capacity at 16 small communities between 2000 and 2001. Of these communities, 4 of them (Dubuque, Iowa; Lafayette, Indiana; Rhinelander, Wisconsin; and Salina, Kansas) lost all of their service. Furthermore, Great Lakes reduced service at 11 communities. Only one community—Telluride, Colorado—gained capacity from Great Lakes.
- Air Wisconsin reduced service at 11 communities and added either new service or additional capacity in 3 communities.
- Great Lakes and Air Wisconsin both served 9 communities in our analysis.

    - Between October 2000 and October 2001, in 3 of those communities (Traverse City, Michigan; Springfield, Illinois; and Eagle, Colorado), Air Wisconsin replaced Great Lakes service, and in one community (Cody, Wyoming) Great Lakes replaced Air Wisconsin service.
    - Both Great Lakes and Air Wisconsin provided service to Grand Junction and Durango, Colorado. Great Lakes discontinued service by October 2001.
    - Casper, Wyoming; Hayden and Gunnison, Colorado all were receiving service from both Great Lakes and Air Wisconsin in 2000. By October 2001, Air Wisconsin had discontinued all of its service.

Table 13 summarizes the changes in service at small communities served by Great Lakes and Air Wisconsin between October 2000 and October 2001.

Table 13: Nonstop Air Service Changes for Communities Served by Great Lakes and Air Wisconsin Between October 2000 and October 2001

Lost all service (4)	Lost capacity (30)		Gained capacity (4)	Gained new service (1)	No change (1)
Dubuque, IA (Great Lakes)	Waterloo, IA (Great Lakes)	Williston, ND (Great Lakes)	Bismarck, ND (Air Wisconsin)	Lincoln, NE (Air Wisconsin)	Billings, MT (Air Wisconsin)
Lafayette, IN (Great Lakes)	Aspen, CO (Air Wisconsin)	Jackson, WY (Air Wisconsin)	Mosinee, WI (Air Wisconsin)		
Rhinelander, WI (Great Lakes)	Appleton, WI (Air Wisconsin)	Montrose, CO (Air Wisconsin)	Telluride, CO (Great Lakes)		
Salina, KS (Great Lakes)	Kalamazoo, MI (Air Wisconsin)	Peoria, IL (Air Wisconsin)	Eagle, CO (Great Lakes/ Air Wisconsin)[b]		
	Scottsbluff, NE (Great Lakes)	Pierre, SD (Great Lakes)			
	Bloomington, IL (Air Wisconsin)	Rapid City, SD (Air Wisconsin)			
	Cheyenne, WY (Great Lakes)	Riverton, WY (Great Lakes)			
	Durango, CO (Great Lakes/Air Wisconsin)[d]	Santa Fe, NM (Great Lakes)			
	Fargo, ND (Air Wisconsin)	Sheridan, WY (Great Lakes)			
	Farmington, NM (Great Lakes)	Springfield, IL (Great Lakes/Air Wisconsin)[a]			
	Gillette, WY (Great Lakes)	Bristol/Johnson/King, TN (Air Wisconsin)			
	Grand Junction, CO (Great Lakes/Air Wisconsin)[d]	Traverse City, MI (Great Lakes/Air Wisconsin) [a]			
	Grand Island, NE (Great Lakes)	Quincy, IL (Air Wisconsin)			
	Cody, WY (Great Lakes/Air Wisconsin)[c]	Gunnison, CO (Great Lakes/Air Wisconsin)[e]			
	Casper, WY (Great Lakes/Air Wisconsin)[e]	Hayden, CO (Great Lakes/Air Wisconsin)[e]			

[a]Communities where Air Wisconsin replaced Great Lakes service and resulted in decreased capacity.

[b]Communities where Air Wisconsin replaced Great Lakes service and resulted in increased capacity.

[c]Communities where Great Lakes replaced Air Wisconsin service, and total capacity decreased.

[d]Communities where Great Lakes and Air Wisconsin initially provided service but Great Lakes discontinued service, resulting in decreased capacity for the community.

[e]Communities where Great Lakes and Air Wisconsin initially provided service but Air Wisconsin discontinued service, resulting in decreased capacity for the community.

Source: GAO analysis of airline schedule data from the Kiehl Hendrickson Group.

Appendix VIII: GAO Contacts and Staff Acknowledgments

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