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FEASIBILITY OF ESTABLISHING A COMMUTER  
AIRLINE SYSTEM IN SOUTH DAKOTA

BY

THOMAS C. HRUBY

A thesis submitted  
in partial fulfillment of the requirements for the  
degree Master of Science, Major in  
Economics, South Dakota  
State University

1976

112 ✓

FEASIBILITY OF ESTABLISHING A COMMUTER  
AIRLINE SYSTEM IN SOUTH DAKOTA

This thesis is approved as a creditable and independent investigation by a candidate for the degree, Master of Science, and is acceptable for meeting the thesis requirements for this degree. Acceptance of this thesis does not imply that the conclusions reached by the candidate are necessarily the conclusions of the major department.

\_\_\_\_\_  
Thesis Adviser

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Date

## ACKNOWLEDGEMENTS

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## CHAPTER I

### INTRODUCTION

In the past decade or two, some basic changes have occurred in many of the nation's rural areas. One of the most important areas of change has been that of transportation.

Transportation facilities and systems are the lifeblood of rural America. The vast agricultural producing Mid-West, of which South Dakota is a part, produces much of the food that feeds the United States as well as foreign consumers. The movement of materials and commodities to and from this area is accomplished, primarily, by rail or truck.

The transportation of people is also of importance to this area and South Dakota. Due to isolation from major manufacturing, business, and trade areas, it is essential that prompt, efficient, economic, and comfortable modes of personal transportation are available. South Dakotans require access to outside areas and likewise, outside centers require ready access to South Dakota. Movement within the State and region is improved when efficient and safe modes of transportation are available.

#### The Problem

With the exception of Amtrak (the Government sponsored rail system), which provides very limited service to the upper Mid-West and none to South Dakota, passenger train service has become history.

A vast system which used to provide passenger service to nearly every town on its routes is now nonexistent.

Bus service lacks the speed of other modes (automobile and airplane), especially when routes require stops at every small town, service station, and major highway intersection between larger cities. Nevertheless, bus service does meet a certain transportation need and in certain instances and on selected routes (non-stop) bus travel could provide a competitive alternative to other modes of transportation.

Air transportation appears to be ideally suited to serving the upper Mid-West. It is a relatively fast, convenient, reliable, and safe mode of travel. Movement to and from and within the region and South Dakota is hastened in most cases, by air travel. However, the reduction and/or cessation of air service is possible for some eastern South Dakota cities in the near future. If air service is reduced or curtailed, these communities will become more isolated and less readily accessible to outside areas. This would undoubtedly affect the economic stability and growth of these communities and their surrounding trade areas.

Initiation of scheduled air taxi or commuter service is perhaps the only way that airline service to many low density points in South Dakota can be continued. This paper contains an

evaluation of the feasibility of a commuter airline system in lieu of or in addition to present air carrier service in South Dakota.<sup>1</sup>

#### Factors Affecting the Problem

The problem of declining air service to smaller, remotely located cities has been precipitated and affected by a variety of interrelated phenomena. These phenomena are contributing factors in the decline of air service to this area and South Dakota.

During the 1960's, the Federal highway construction program vastly expanded our nation's highway system, thus encouraging greater use of the automobile as the primary mode of personal transportation in short-haul<sup>2</sup> situations. Competition from the automobile and the highway system have been mentioned as big factors in reducing the use of air transportation in short-haul markets.<sup>3</sup> Local airlines contend that it is very difficult for them to provide a good selection of flight frequencies at smaller communities. This makes driving with its great flexibility a more convenient form of travel over short distances.

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<sup>1</sup>Refer to the Glossary of Terms and List of Abbreviations for an explanation of terms and abbreviations used in the text.

<sup>2</sup>Short-haul refers to trips of 200 miles or less.

<sup>3</sup>In late 1971, Mr. David Moran, vice president for traffic and sales, North Central Airlines, said that, "Previously the 50-60-mile market was considered short haul; now it is 150 miles and under. We get creamed by freeways." James P. Woolsey, "Locals Predict Rising Subsidy Needs." Aviation Week & Space Technology, November 15, 1971, p. 26.

Other factors also contribute to passengers' decisions to drive to major terminals rather than to use the smaller, less frequently served airports. The Athens, Georgia--Atlanta market (67 miles apart), is an excellent example. When better parking facilities were built at Atlanta, airline passenger traffic from Athens to Atlanta showed a decline. Further drops were noticed when the limousine service between Athens and Atlanta was improved.<sup>1</sup>

Population shifts in the plains states have brought about a redistribution of population. Despite the movement of population into major urban areas, many small communities continue to express a desire for scheduled air service. This demand will most likely increase if recent trends of movement back into the less populated Mid-West continues.

Also, the composition and market structure of local airlines has changed as the result of mergers and route expansion. The locals have shifted their emphasis to longer and denser routes that serve larger hub terminals rather than emphasizing service to small towns and cities.<sup>2</sup>

There are various examples of this change in the route structure. In 1969 Mohawk extended from its traditional upstate New York points to Chicago and the Twin Cities; North Central was

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<sup>1</sup>U.S. Department of Transportation, Civil Aeronautics Board, Remarks Before the Joint Luncheon of the Kiwanis Club and Chamber of Commerce of Wichita, Kansas by Secor D. Browne, (Washington, D.C.: U.S. Government Printing Office, 1972), p. 9.

<sup>2</sup>Ibid., p. 10.

certified to fly the Denver--Twin Cities route; Ozark went from Iowa and Illinois to New York and Washington; Piedmont was awarded a route to Chicago; Chicago, Miami, and St. Louis were added to Southern's system; and Texas International was awarded Los Angeles and Denver routes. Only one year earlier, Allegheny extended its routes to Albany and Memphis while even earlier Piedmont was certified to fly Washington and New York routes. The rationale behind these awards was that through these highly profitable routes the airlines could partially make up the losses entailed in flying short-haul routes and serving small communities.<sup>1</sup>

The regional carriers have invested and continue to invest in larger and faster equipment. For example, their investment in flight equipment rose from \$133 million in 1965 to \$541 million by the end of 1969. In a similar vein, their debt rose from \$110 million in 1965 to \$550 million in 1969, an increase of over 400 percent. Interest expense during the same time period increased from \$5 million in 1965 to \$41 million in 1969. These figures are largely the result of an extensive expansion of the jet powered aircraft inventory of the industry.<sup>2</sup>

As the size and speed of the aircraft purchased has grown, the scheduled service to many communities has decreased to mere

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<sup>1</sup>U.S. Department of Transportation, Civil Aeronautics Board, Remarks Before the Association of Local Transport Airlines by John G. Adams, (Washington, D.C.: U.S. Government Printing Office, 1970), p. 3.

<sup>2</sup>Ibid., p. 2.



tokenism. In some localities, the aircraft cannot use the airports due to insufficient runway length, and therefore, these communities no longer receive service.<sup>1</sup>

The use of faster equipment on short-haul routes has a limited effect in reducing travel time because of the fixed amount of time required to take-off, climb to cruising altitude, descend, land and taxi regardless of the aircraft used. Considering that most travel is for business reasons, the best way a local service carrier can make its service more attractive in short-haul markets with good travel alternatives, i.e. automobiles, is either to have better timing in the schedule or to increase the frequency of service.<sup>2</sup>

Finally, since the mid-1960's, scheduled air taxis and commuter carriers offering scheduled services have expanded on a nationwide basis. In 1972, these carriers provided service to 150 points that weren't certified by the Civil Aeronautics Board (CAB). In addition, they served numerous certified markets and locations and provided replacement service at about 60 locations for certified carriers. In general, they have been able to give better schedule timing, greater frequencies of service, and overall improved performance for the consumer.<sup>3</sup>

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<sup>1</sup>Browne, Remarks Before the Joint Luncheon, p. 10.

<sup>2</sup>George C. Eads, The Local Service Airline Experiment, (Washington: The Brookings Institution, 1972), p. 29.

<sup>3</sup>Browne, Remarks Before the Joint Luncheon, p. 10.

The local carriers are facing a dilemma in responding to the needs of small communities on their systems. Especially in recent years, rapidly rising costs have resulted in the need for substantially increased subsidies if their smallest system points are to continue to receive service. Through deletions, consolidations, and suspensions, the local carriers have been seeking to reduce their service obligation to small communities. Temporary suspensions have been sought and granted to local carriers at some localities. Thus, service by locals has become less responsive to the needs of smaller cities; local systems have expanded, but schedules have been made to suit the needs of the higher density points on the systems.<sup>1</sup>

Eads, who conducted research evaluating the local airline system, has concluded that the performance of the local service airlines has fallen far short of the goal established by the CAB.<sup>2</sup> He contends that the result of twenty-five years of faulty government regulation and subsidization has led to the creation of "junior trunklines" out of the locals. He argues that the quality and quantity of airline service provided to the smaller communities that depend solely on local carriers has deteriorated over the past ten years. At the same time, he claims that the per-passenger cost to

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<sup>1</sup>Ibid., p. 11.

<sup>2</sup>Eads, The Local Service Airline Experiment, p. viii.

the federal government of providing this service has not fallen and may have increased.

In many instances, due to the relative remoteness of their location, the economic well being of rural communities depends upon transportation. These communities don't have access to good rail or rapid transit systems and therefore require good, dependable air transportation. Industry is reluctant to locate facilities in a city or area that isn't easily accessible. A good air transportation system aids that accessibility.

#### South Dakota Conditions

Within the next five years, the replacement of present aircraft (Convair 580) or of airline service itself may be faced by some communities in South Dakota. North Central Airlines, which is the only airline that serves all nine air carrier cities in South Dakota, has publicly stated that it intends to go to an all jet fleet on all routes in South Dakota by the 1980's.

At the present time, 77 percent of South Dakota's citizens are within approximately sixty minutes driving time of a community served by scheduled airline transportation. If North Central Airlines replaces their prop-jets with jet aircraft, as they have stated they will, service would have to be terminated at Brookings and Yankton unless substantial improvements are made to the present facilities--primarily, lengthening runways. In addition, runway strengthening would be required to accomodate heavier jet aircraft

at Mitchell and Huron. Considering the low number of boardings at Brookings, Mitchell, Huron and Yankton (see table 1), scheduled air transportation might be deleted at these localities. If this were to occur, the proportion of the state's population within sixty miles driving time of a terminal with scheduled airline service would fall to approximately 61 percent.<sup>1</sup>

The extensive work done on the Interstate highway system in South Dakota increased the use of the automobile as a means of personal travel. Interstate Highways 90 and 29 put many towns and cities "closer" to their neighbors and reduced the driving time to a larger hub terminal with a more inviting array of flights. As an example, Brookings is now approximately one hour away from Joe Foss Field in Sioux Falls as the result of Interstate Highway 29. Mitchell, although slightly farther away, is now also within comfortable driving distance of Sioux Falls because of its direct access to Interstate Highway 90. This ready availability of good highways would effect the selection of air transportation as a mode of travel.

South Dakota has experienced a shift in its population. Along with many other midwestern states, the state's population increased up through the 1960 census. A drop of 14,000 or

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<sup>1</sup>Monte Schneider, Director of Aeronautics, South Dakota Department of Transportation, to Tom Hruby, Brookings, 27 February 1975, South Dakota Air Transportation.

TABLE 1

SOUTH DAKOTA AVERAGE AIRLINE PASSENGER BOARDINGS  
SCHEDULED AND NON-SCHEDULED

Airports	Passengers Per Day				
	1970	1971	1972	1973	1974
Aberdeen	65.0	75.7	73.4	70.9	79.2
Brookings	6.1	3.2	5.3	6.0	6.6
Huron	24.8	19.3	16.4	11.3	11.1
Mitchell	9.1	6.8	7.0	9.3	10.4
Pierre	63.1	69.1	72.5	86.9	95.7
Rapid City	237.6	258.9	282.3	322.3	327.4
Sioux Falls	465.5	511.9	521.2	585.1	621.2
Watertown	28.4	32.2	27.2	37.8	41.2
Yankton	8.9	9.3	10.4	11.3	12.7
Totals	908.5	968.4	1015.7	1140.9	1205.5

SOURCE: U.S. Department of Transportation, Civil Aeronautics Board, Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended June 30, 1970, (Washington, D.C.: U.S. Government Printing Office, 1970), pp. 143-44; U.S. Department of Transportation, Civil Aeronautics Board, Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended June 30, 1971, (Washington, D.C.: U.S. Government Printing Office, 1971), p. 106; U.S. Department of Transportation, Civil Aeronautics Board, Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended June 30, 1972, (Washington, D.C.: U.S. Government Printing Office, 1972), p. 106; U.S. Department of Transportation, Civil Aeronautics Board, Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended June 30, 1973, (Washington, D.C.: U.S. Government Printing Office, 1973), p. 103; and U.S. Department of Transportation, Civil Aeronautics Board, Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended June 30, 1974, (Washington, D.C.: U.S. Government Printing Office, 1974), p. 98.

NOTE: Average passengers per day was computed by dividing the total number of passengers boarded at each location by 365.

Boardings--Refers to passengers boarding the aircraft at that service point.

2.1 percent, was recorded between 1960 and 1970.<sup>1</sup> Nevertheless, seventeen of the State's counties experienced population increases (see figure 1). Of the counties experiencing increases in population, all except two, Todd and Shannon, either had air carrier cities in them or were adjacent to counties with air carrier cities (see Figure 2).

#### Possible Impacts in South Dakota

South Dakota has experienced not only a net out-migration of some of its population since 1960 but also a concentration of population in counties near air carrier cities. If past population movement trends continue, the state will experience a greater loss to out-of-state communities and/or a greater concentration in existing population centers of the state. If North Central Airlines goes to an all jet fleet of aircraft, some Eastern South Dakota communities may lose their present service or have it reduced. If gasoline prices continue to escalate and the speed limit remains at fifty-five miles-per-hour, automobile travel might become less desirable as a means of short-haul transportation. If these phenomena occur, then South Dakota will require a supplemental form of transportation.

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<sup>1</sup>U.S. Department of Commerce, Bureau of the Census. Census of Population; 1960, Volume I, Characteristics of the Population, Part A, Number of Inhabitants (Washington, D.C.: U.S. Government Printing Office, 1961), pp. 1-60; and U.S. Department of Commerce, Bureau of Census. Census of Population; 1970, Volume I, Characteristics of the Population, Part 43, South Dakota (Washington, D.C.: U.S. Government Printing Office, 1973), pp. 14-15.

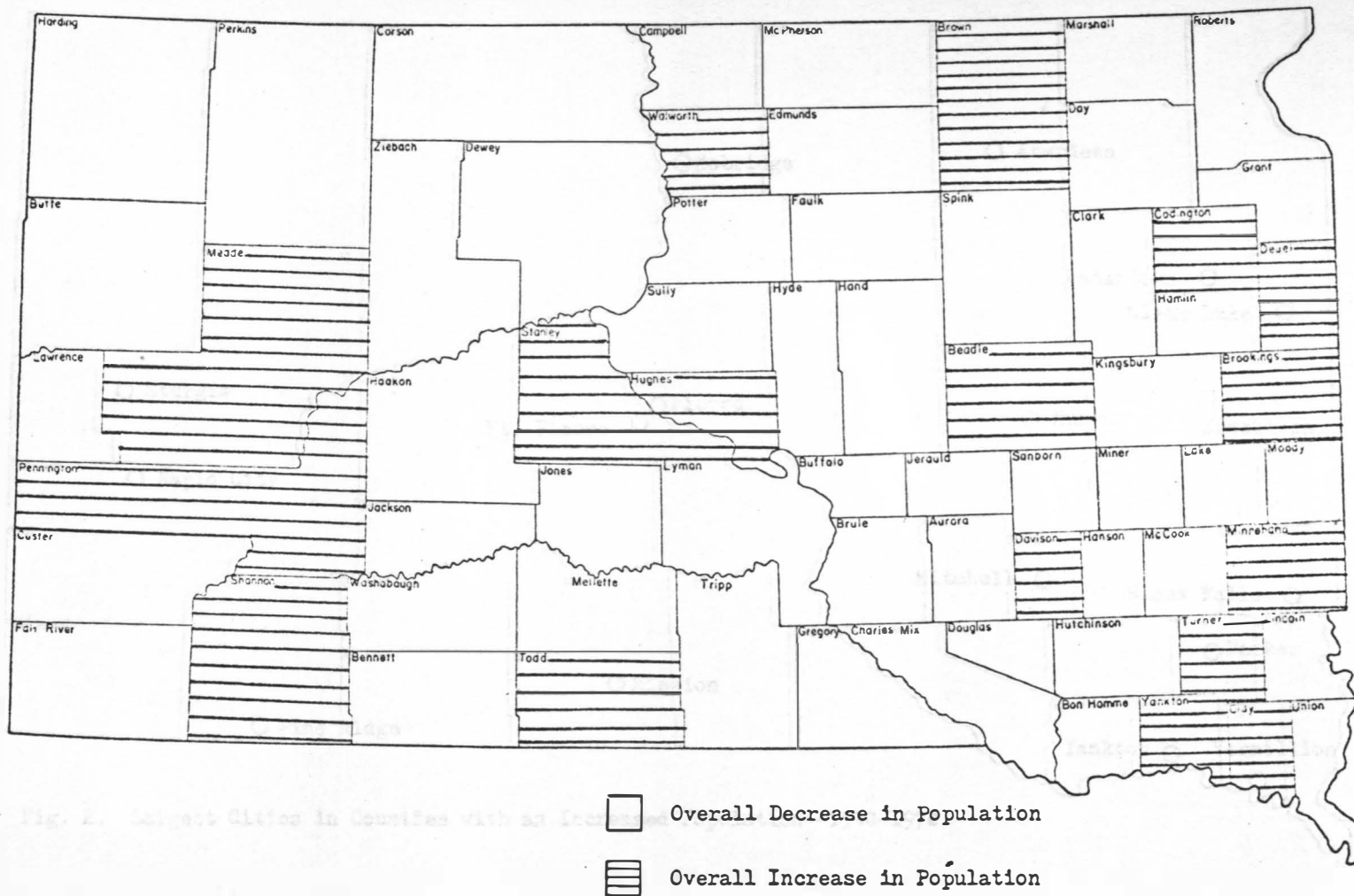


Fig. 1. South Dakota Population Changes by County--1940-1970

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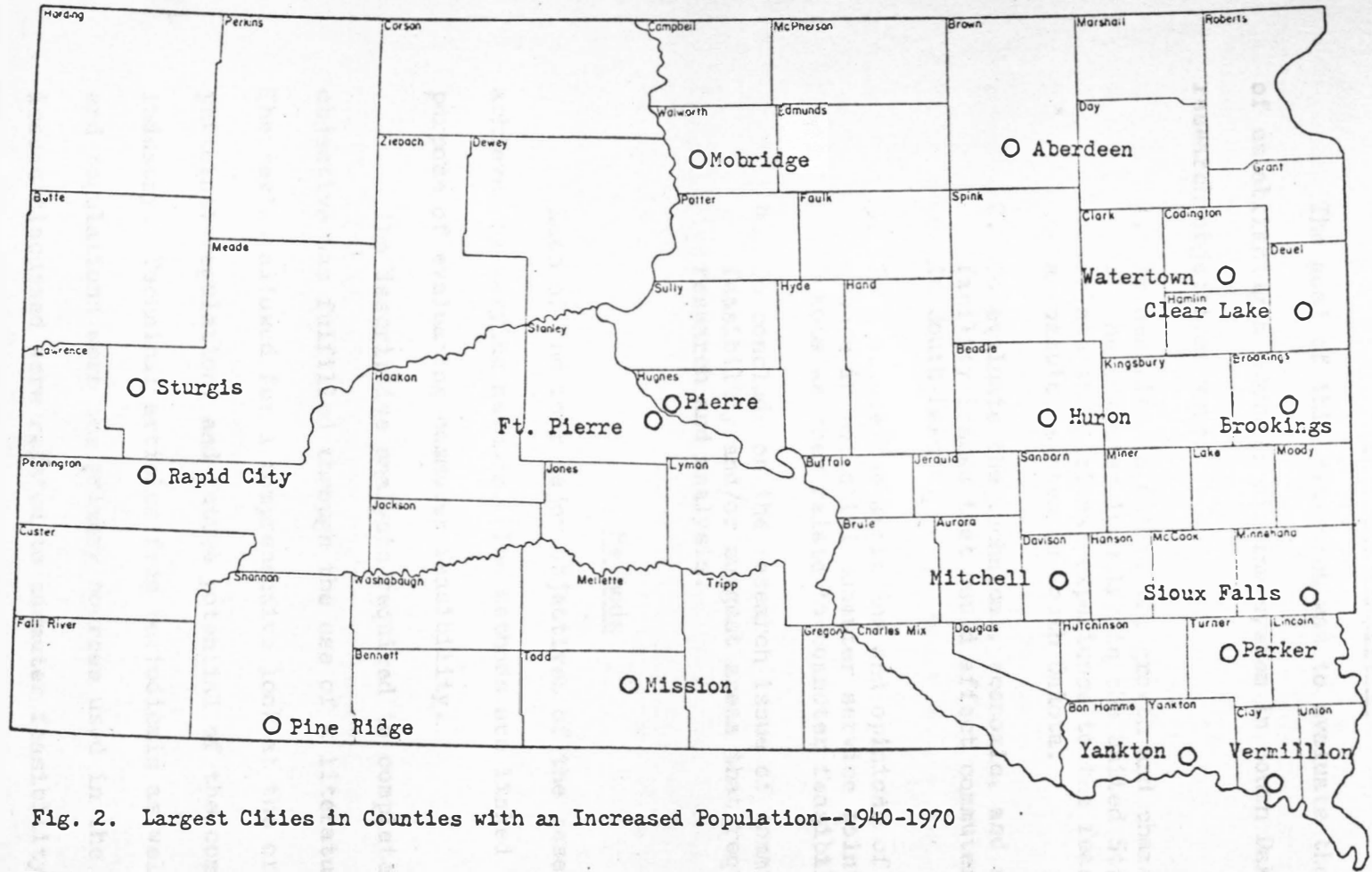


Fig. 2. Largest Cities in Counties with an Increased Population--1940-1970



### Goal and Objectives

The goal of this research was to evaluate the feasibility of establishing a commuter airline system in South Dakota. Specific research objectives were:

1. To describe in detail the growth and characteristics of the commuter industry in the United States and relate the national experience to the feasibility of a commuter system in South Dakota.
2. To evaluate the technical, economic, and airport facility issues that would affect commuter feasibility in South Dakota.
3. To evaluate the attitudes and opinions of interested groups in potential commuter service points in South Dakota as they relate to commuter feasibility.
4. To conclude on the research issue of commuter feasibility and/or suggest areas that require further research and analysis.

### Methods

Each of the four major objectives of the research was achieved by varying methods. The methods are linked by their common purpose of evaluating commuter feasibility.

The descriptive analysis required to complete the first objective was fulfilled through the use of a literature review. The review allowed for a comprehensive look at the origin, growth patterns, regulation, and future potential of the commuter airline industry. Technical articles from periodicals as well as laws and regulations were the primary sources used in the review. The issues discussed were related to commuter feasibility in South Dakota by describing how the commuter industry has evolved and

adapted to meet air transportation requirements in other areas of the United States. This adaptive quality may be essential to the success of the system in South Dakota.

Supplemental issues relating to commuter feasibility also were discussed by use of a literature review. Literature and regulations dealing with subsidy, joint fares, air mail and air cargo were examined for their impact on commuter feasibility. Various proposals for implementing the subsidization of the commuter industry were presented. The importance of these issues to commuter feasibility in South Dakota was subsequently discussed.

To identify potential users of short-haul transportation, past studies were reviewed. Factors affecting consumer demand for short haul transportation were identified through a personal interview with North Central Airlines officials and a review of pertinent literature on the subject. This information was related to the South Dakota market by presenting statistics on South Dakota air travel provided by the Civil Aeronautics Board (CAB).

The costs of airline operation were defined and discussed by use of a brief literature review. The evaluation of different aircraft as commuter vehicles was performed by comparing cost data which were supplied by the various aircraft manufacturers. Data on purchasing costs, operating costs and performance characteristics were presented and compared. In order to obtain a comparative analysis of commuter aircraft and aircraft currently used by air

carriers on routes in South Dakota, operating costs of the latter were presented.

Further analysis was performed by estimating the enroute time, operating costs, and fuel used by various aircraft on a hypothetical route in South Dakota--Aberdeen to Sioux Falls with stops in Watertown and Brookings. Potential demand for the route was derived from 1974 North Central Airlines data concerning south-bound traffic from the cities of Aberdeen, Watertown, and Brookings. Performance data computed from charts, graphs, and tables supplied by aircraft manufacturers and North Central Airlines were used to estimate time enroute and fuel consumption for the various legs of the route. Using the time enroute figures, operating costs for the aircraft were computed using cost data supplied by North Central Airlines and Allegheny Airlines. Operating costs on a per-passenger basis were obtained by dividing total costs by the projected passenger demand. Costs relevant to increased demand were obtained by projecting incremental increases in demand--from 10 to 100 percent. With the increased demand, the number of flights required to transport the passengers was determined and multiplied by the operating costs to get total operating costs. The total operating costs were subsequently divided by the number of passengers to arrive at per-passenger costs. Per-passenger costs, time enroute, and fuel consumed were used to evaluate the trade-offs involved in operating the various aircraft on the hypothetical route.

A description of the present South Dakota air transportation system and facilities was accomplished by an inventory of current service patterns, airports, and air navigation equipment. Data provided by the South Dakota Division of Aeronautics and the Federal Aviation Administration were used to outline current airline and non-scheduled air taxi service. Minimum commuter airport criteria were developed considering requirements for the safe, comfortable, and continuous operation of a commuter system. Using these criteria, South Dakota airports were evaluated in terms of their acceptability as commuter service points. Data generated by the Montana Study which estimated construction costs for airport improvements were used as the basis for estimating the costs of facility improvements.

The third objective was achieved through the use of data obtained by mail questionnaires. Questionnaires were sent to fixed base operators,<sup>1</sup> chambers of commerce and airport boards. These groups' responses to questions concerning their interest in becoming involved in the operation and support of a commuter system were used as indicators of commuter feasibility. This approach was used because it was judged that commuter feasibility depends upon the direct involvement and support of aviation businesses and communities in the state.

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<sup>1</sup>Fixed base operators refers to businesses providing flying services at airports. They would provide such services as flight training, aerial spraying, and air charter.

The final objective was completed after reviewing the findings of the study. The findings were also used in identifying areas that would require further research if an interest in and desire for a commuter airline system were expressed.

#### Scope and Limitations

The study is defined and limited by various geographical, resource and data parameters. The study limits itself to South Dakota. However, all of the data concerning commuter operations come from out-of-state sources. The airline systems dealt with are commuter, local, and trunk carriers with emphasis on commuter operators.

The study evaluates initiation of a commuter service as an addition to or replacement of present air carrier service to the nine air carrier cities in the state. The research concentrates on these cities because they currently have the required airport facilities for commuter operations. Other airports in the state--non air carrier airports--are evaluated in terms of the improvements that would be required for them to become useable for a commuter system.

Aircraft used in the commuter industry and the costs involved with operating these aircraft are presented. As a means of comparative analysis, the costs associated with aircraft operated by North Central Airlines in South Dakota are also considered. All costs are estimates or data supplied by aircraft manufacturers and

operators. The research is limited to costs and economic conditions existing in calendar year 1975.

Data used in the study were obtained through the resources of Lincoln Library, South Dakota State University, inter-library loan system, Federal Aviation Administration, Civil Aeronautics Board, Commuter Airline Association, Allegheny Airlines and their commuter operators, North Central Airlines, Ozark Airlines, and Frontier Airlines. In addition, questionnaires were used to gather data from fixed base operators, chambers of commerce, and airport boards in the air carrier cities in South Dakota.

#### Chapter Review

In Chapter II, an examination of the commuter industry is used to illustrate the position of commuters in the air transportation industry with particular emphasis on their growth and adaptation. This information as well as that presented in Chapter III, which discusses supplemental issues affecting commuter feasibility, is related to conditions in South Dakota.

Chapter IV delves into the identification of users of short-haul air transportation, factors affecting the level of usage, and the costs involved in operating an airline. Costs for selected commuter aircraft are estimated and compared to those for aircraft operated by North Central Airlines in South Dakota.

Chapter V contains a discussion of the costs involved in operating an airline. Estimates of operating costs for various aircraft are used in a comparative analysis on a hypothetical route

in order to evaluate the trade-offs involved with operating these aircraft. The possible impact of a commuter system on the state and region are also presented.

In Chapter VI, an examination of airport facilities and air navigation aids is undertaken to identify those airports that are suitable for commuter operations. Criteria were selected and used to pick airports that have adequate runway length, lighting, navigational aids, and terminal facilities.

In order to more fully evaluate the impact of a commuter system on the economic well being of a community, questionnaires were used to gain inputs from affected parties. Evaluation and analysis of the responses of fixed base operators, chambers of commerce, and city governments in the current air carrier cities are presented in Chapter VII.

The summary of the research as well as the findings, conclusion, and recommendations are presented in Chapter VIII. Areas requiring further research are suggested.

## CHAPTER II

### COMMUTER AIRLINE POSITION, GROWTH, AND FUTURE IN THE SCHEDULED AIR TRANSPORTATION INDUSTRY

The scheduled air carrier industry of the United States is composed of three segments which operate within its states and territories. They are the trunkline, local, and commuter air carriers. The three components, although serving different markets, serve a particular transportation need--scheduled air transportation.

This chapter is designed to describe these segments with particular emphasis on the commuter air carriers.<sup>1</sup> Emphasis is given to describing growth in the third level industry in recent years and its potential for use in South Dakota. A comprehensive description of the scheduled air carrier industry, especially commuter, is necessary to an understanding of how and why the concept should be considered for South Dakota.

#### Trunkline Carriers

The nation's major airlines, known as trunkline carriers, were permanently certified as scheduled air carriers under the "grandfather" provisions of the Civil Aeronautics Act of 1938. Under these provisions, they were given certificates of "public

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<sup>1</sup>Commuter air carriers may also be referred to as the third level industry--trunklines are the first level and locals the second level.



convenience and necessity" to provide scheduled air transportation over a particular route or system of routes.<sup>1</sup>

Since their original certification, none of the original sixteen carriers has gone out of business. However, by 1970, mergers had reduced the number of separate carrier companies to eleven. These eleven domestic carriers continue to comprise the trunkline segment of the industry.<sup>2</sup>

#### Local Carriers

After a period of study, consideration, and political pressuring, the Civil Aeronautics Board (CAB) announced on July 11, 1944 that it was initiating an experiment to expand scheduled air service to the more isolated and smaller communities in the United States. They did this even though the traffic potential was not judged to be encouraging at that time. In order to achieve this goal, a group of feeder or local service carriers, which would specialize in providing low-density, short-haul air service, was established. Feeder routes, designed to terminate at cities already receiving scheduled air service, were established. However, to prevent competition from arising between the trunkline and the local carriers, the locals were required to stop at every certified point they served between major hub terminals. By requiring this, the CAB kept the local carriers from competing with the trunklines.

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<sup>1</sup>Eads, The Local Service Airline Experiment, pp. 3-4.

<sup>2</sup>"Airline Traffic--April 1975," Aviation Week & Space Technology, July 21, 1975, p. 34.

This requirement also assured that the communities between the major hubs would be provided with better service under this system.<sup>1</sup>

Because of the experimental nature of this system, these carriers were issued temporary certificates. The reasoning was that if the experiment didn't work or a carrier was judged not capable of providing scheduled service, the concept or the carrier could be dropped.<sup>2</sup>

Between 1945 and 1950, the Board certified eighteen carriers to provide short-haul air transportation under the local experiment. Of the original group, three were subsequently denied renewal of their certificates when they expired and seven others merged with other locals or with a trunkline carrier.<sup>3</sup> The eight remaining survivors of the original group comprised the local industry until July of 1974 when Air New England, formerly a commuter operator, was designated a local service carrier. Unlike most locals, Air New England supplies service with six Douglas DC-3's, six DeHavilland of Canada Twin Otters, and four Beech 99's, which are all smaller than most aircraft used by the local carrier industry.<sup>4</sup>

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<sup>1</sup>Eads, The Local Service Airline Experiment, p. 87.

<sup>2</sup>Ibid., p. 1.

<sup>3</sup>Ibid., p. 4.

<sup>4</sup>"Air New England Named Local," Aviation Week & Space Technology, July 22, 1974, p. 18.

Telephone interview with David Norn, North Central Airlines, 137 S. Brookings, South Dakota, 28 October 1975.

An initial objective of the CAB experimental program was to make the locals financially solvent and self-sufficient. However, a subsidy system was established to partially compensate the carriers for providing service at their certified points in the interim period. The subsidies continue today.<sup>1</sup>

Although the local carriers were authorized specifically to provide short-haul and low-density air service, by 1950 many of them were like the smaller trunklines in terms of routes and service points. Furthermore, those local carriers who were closest to achieving the CAB's goal of financial self-sufficiency had routes most like those of the trunklines.<sup>2</sup>

In 1955, Congress directed the CAB to grant permanent certificates to the local carriers. Currently, with the exception of Air New England which is operating on a three year temporary certificate, all the local carriers are permanently certified. However, they continue to have some routes with temporary certification policies.<sup>3</sup>

#### Commuter Industry

Commuter air carrier, third level carrier, and scheduled air taxi are all terms used to designate carriers operating

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<sup>1</sup>Eads, The Local Service Airline Experiment, p. 5.

<sup>2</sup>Ibid., p. 105.

<sup>3</sup>Telephone interview with David Moran, North Central Airlines, Inc., Brookings, South Dakota, 28 October 1975.

scheduled service under Part 298 of the Civil Aeronautics Board's Economic Regulations. These terms are used interchangeably in the paper.

Under the provision known as the air taxi exemption, aircraft that have a passenger carrying capacity of thirty or less or a useful load of 7500 pounds or less could operate under this regulation. The distinctive characteristic of this operating system is that commuter carriers are not treated the same as the certified carriers because they do not receive certificates of public convenience and necessity.<sup>1</sup>

#### Commuter Industry Regulation

The commuter industry, although a very uncontrolled entity when compared to the rest of the scheduled airline industry, is required to meet certain regulatory requirements. These regulations provide for the safe conduct of flight while providing a minimum of control over day-to-day operations.

#### FAA Regulation

Aircraft operated by commuter carriers are all subject to maintenance and inspections performed at periodic intervals as prescribed by FAA procedures for commercial operations. The aircraft

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<sup>1</sup>Eads, The Local Service Airline Experiment, p. 5.

are all types that are tested and certified by the FAA as airworthy prior to their introduction into service.<sup>1</sup>

Commuter airline pilots, like the commuter aircraft, are licensed and supervised by the FAA for air carrier operations. In addition to meeting FAA physical standards, the pilots are required to receive recurrent training and a flying proficiency check ride every six months.<sup>2</sup>

### CAB Regulation

In terms of CAB regulation, the basic differences between commuters and other scheduled carriers are that commuters can begin and end service at will; subject to state regulations; and they can fly the routes they want and charge whatever they want for their services.<sup>3</sup> These features are in marked contrast to the close control and regulation maintained over the certified airline industry. The unstructured growth and advancement of commuter service is much different from that of the local carriers who were, from their inception, kept under strict regulation.<sup>4</sup> Thus, the commuter industry is regulated by the Civil Aeronautics Board under a laissez faire policy.

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<sup>1</sup>Report Number 3: Commuter Airlines (Washington, D.C.: Commuter Airlines Association, July, 1975), p. 1.

<sup>2</sup>Ibid.

<sup>3</sup>Eads, The Local Service Airline Experiment, p. 5.

<sup>4</sup>Ibid., p. 6.

Part 298

Part 298 of the CAB's economic regulations is the document which guides the commuter industry. This controlling document classifies commuter air carriers according to the following criteria:

1. They engage in the direct air transportation of passengers and/or property, and/or in transportation within the 48 contiguous States, Alaska or Hawaii of mail by aircraft;
2. They do not directly or indirectly use large aircraft in air transportation;
3. They do not hold a certificate of public convenience and necessity or other economic authority issued by the Board;
4. They have and maintain in effect liability insurance coverage in compliance with the requirements of Part 298 and have and maintain a current certificate of insurance evidencing such coverage on file at the Board;
5. They have registered with the Board and continue to file operations reports detailing the volume of business conducted by the carrier in all its flights.<sup>1</sup>

The Board, in an attempt to control and limit competition between third level and local or trunkline carriers has limited the capacity of commuter aircraft.<sup>2</sup> Commuter operators cannot use aircraft that can carry more than thirty passengers or have a useful load of more than 7500 pounds.

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<sup>1</sup>U.S. Department of Transportation, Civil Aeronautics Board, Economic Regulations; Part 298: Classification and Exemption of Air Taxi Operators (Washington, D.C.: U.S. Government Printing Office, July 1, 1969), p. 298-304.

<sup>2</sup>"CAB Clarifies Payload Rule." Aviation Week & Space Technology, July 24, 1972, p. 18.

These criteria are designed to improve the service provided by third level carriers and aid in their development. In addition, it is hoped that these criteria will aid in creating incentives for the development and production of new aircraft suitable for operation by carriers in the third level industry.<sup>1</sup>

#### Size and Growth of Commuter Industry

The third level industry has grown and expanded in recent years. Thousands of air taxi firms have operated since the air taxi exemption was established in 1952. The number of scheduled air taxis (commuter air carriers) was small until the 1960's. In 1964, for example, there were twelve operators with seventy-two aircraft serving scheduled routes. In 1968, this number had grown to over two hundred scheduled operators.<sup>2</sup>

Even though scheduled air taxi service began in the 1950's, it wasn't until 1969 that the CAB created the specific commuter industry that we know today. The CAB, in that year, issued an order defining a commuter air carrier as "an air taxi operator which (1) performs at least five round trips per week between two or more points and publishes flight schedules which specify the times, days of the week and places between which such flights are

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<sup>1</sup>"Rules on Size, Weight Eased for Air Taxis." Aviation Week & Space Technology, July 24, 1972, p. 18.

<sup>2</sup>Eads, The Local Service Airline Experiment, p. 5.

performed, or (2) transports mail by air pursuant to a current contract with the U.S. Postal Service."<sup>1</sup>

### Commuter Industry Growth

A closer inspection of the third level industry reveals some interesting growth comparisons. In 1970, for example, there were 176 carriers who transported 4.3 million passengers, 44.2 million pounds of cargo, and 75.1 million pounds of mail. These figures can be compared to 1974 when 222 carriers moved 6.3 million passengers, 111.6 million pounds of cargo, and 150.9 million pounds of mail.<sup>2</sup>

A comparison of the two years reveals that the number of carriers filing reports with the CAB increased by 26.1 percent; the number of passengers carried increased by 46.5 percent; the weight of cargo transported increased by 152.2 percent; and the amount of air mail hauled increased by 100.8 percent. These are sizable and noteworthy gains that display the rather rapid growth in the scheduled air taxi industry.

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<sup>1</sup>Report Number 3, p. 1.

<sup>2</sup>U.S. Department of Transportation, Civil Aeronautics Board, Commuter Air Carrier Activity; Year Ended December 1970 (Washington, D.C.: U.S. Government Printing Office, 1971), p. 5; and U.S. Department of Transportation, Civil Aeronautics Board, Commuter Air Carrier Traffic Statistics; Year Ended June 30, 1974 (Washington, D.C.: U.S. Government Printing Office, July 1975), p. 1.



A more detailed, year-by-year comparison of the third level industry can be obtained by referring to table 2. It is interesting to note that while the number of commuter operators declined in 1970 and 1971--the number of operators was in excess of two hundred in 1968--the number of passengers, amount of cargo, and weight of the air mail carried continued to increase.

### Composition of the Commuter Industry

Characteristics of the various operational entities that made up the commuter industry in Fiscal Year 1974 are displayed in table 3. This table illustrates the different types of operations or combinations of operations, the number of airports served by each type of operation, and the city-pairs<sup>1</sup> served by the different combinations of operations.

Passenger and cargo, passenger only, and passenger, cargo, and mail comprised the majority of the various types of service. Taken together, these types of service were offered by 72 percent of the carriers who served 76 percent of the airports and 66.7 percent of the city-pairs in 1974. The industry is one that requires and seeks diversification in the type of service offered to consumers. This diversification, as will be seen later when discussing supplementary issues, may be essential for most commuter airlines.

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<sup>1</sup>City-pairs refers to two cities who are connected by an airline through its' route structure.

TABLE 2  
COMMUTER OPERATIONS--1970-1974

	1970	1971	Percent Change	1972	Percent Change	1973	Percent Change	1974	Percent Change	Percent Change 1970-74
Carriers	176	160	- 9.0	182	+15.0	216	+17.0	222	+ 3.0	+ 26.1
Passengers <sup>a</sup>	4.3	4.7	+ 9.4	5.1	+12.0	5.7	+ 8.1	6.3	+10.7	+ 46.5
Cargo (Tons)	22,123	25,606	+15.7	37,286	+45.6	26,481	+24.7	55,798	+20.0	+152.2
Mail (Tons)	37,568	50,068	+34.0	63,088	+25.3	73,897	+17.1	75,440	+ 2.1	+100.8

SOURCES: U.S. Department of Transportation, Civil Aeronautics Board, Commuter Air Carrier Activity; Year Ended December 1970 (Washington, D.C.: U.S. Government Printing Office, 1971), p. 5; U.S. Department of Transportation, Civil Aeronautics Board, Commuter Air Carrier Activity; Year Ended December 1971 (Washington, D.C.: U.S. Government Printing Office, 1972), p. 5; U.S. Department of Transportation, Civil Aeronautics Board, Commuter Air Carrier Activity; Year Ended December 1972 (Washington, D.C.: U.S. Government Printing Office, 1973), p. 5; U.S. Department of Transportation, Civil Aeronautics Board, Commuter Air Carrier Activity; Year Ended December 1973 (Washington, D.C.: U.S. Government Printing Office, 1974), p. 6; and U.S. Department of Transportation, Civil Aeronautics Board, Commuter Air Carrier Traffic Statistics; Year Ended June 30, 1974 (Washington, D.C.: U.S. Government Printing Office, July 1975), p. 7.

<sup>a</sup>Stated in millions.

TABLE 3

## SUMMARY OF COMMUTER AIR CARRIER SERVICE--YEAR ENDED JUNE 30, 1974

Type of Service	Carriers		Airports		City-Pairs	
	Number	Percent	Number	Percent	Number	Percent
Passenger Only	28	12.6	85	11.7	405	21.9
Cargo Only	27	12.1	45	6.2	301	16.2
Mail Only	23	10.4	77	10.6	236	12.7
Passenger & Cargo	83	37.4	268	37.0	665	36.0
Passenger & Mail	2	1.0	16	2.2	25	1.4
Cargo & Mail	10	4.5	36	5.0	55	3.0
Passenger, Cargo, & Mail	49	22.0	198	27.3	162	8.8
TOTAL	222	100.0	725	100.0	1,849	100.0

SOURCE: U.S. Department of Transportation, Civil Aeronautics Board, Commuter Air Carrier Traffic Statistics; Year Ended June 30, 1974 (Washington, D.C.: U.S. Government Printing Office, July 1975), p. 34.

#### Communities Served

The communities served by commuter airlines vary widely in size. Table 4 illustrates the range in population of cities served by commuter airlines and it also displays the percent each category represents for 1974.

Cities under 50,000 population comprised 58.7 percent of the communities served by commuter airlines in 1974. It is this

market that the commuter airlines are particularly adept at serving. The service at the larger cities is the result of feeding passengers into hub terminals for connecting flights and also receiving passengers for flights to the smaller cities.

TABLE 4

## COMMUTER SERVED CITIES BY POPULATION--1974

Population	Number	Percent
Less than 10,000	81	19.8
10,000 - 24,999	92	22.5
25,000 - 49,999	67	16.4
50,000 - 99,999	23	5.6
100,000 - 499,999	94	23.0
500,000 or more	52	12.7
TOTAL	409	100.0

SOURCE: Report Number 3: Commuter Airlines (Washington, D.C.: Commuter Airlines Association, July 1975), p. 2.

In general, commuter airlines serve communities where the business activity, population or level of air transportation demand is not sufficient to support trunk or local service airlines with their large aircraft. Commuter airlines fill the gap, allowing

more frequent flights and improved economy for the air traveler in these communities.<sup>1</sup>

### Commuter Markets

Third level carriers have developed some markets themselves. They have also adopted markets for which the CAB approved suspension/replacement arrangements between commuters and certified carriers. Under such an arrangement, the certified carrier discontinues service in loss markets. This results in a reduction of their federal subsidy which lowers the overall level of subsidy on a national basis. Lowered subsidy results in a direct savings for the federal government and an indirect savings for the taxpayer.

Suspension/replacement arrangements have been used extensively by local carriers especially Allegheny Airlines.<sup>3</sup> Allegheny's system of commuter "agents" is discussed in more detail in Appendix 1.

### Commuter Aircraft

A more complete understanding of the size and scope of the third level industry can be obtained by noting the types of aircraft used in commuter operations. Table 5 displays the number and dollar

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<sup>1</sup>Report Number 3, p. 2.

<sup>2</sup>Ibid.

<sup>3</sup>A thorough listing of suspension/replacement arrangements can be found in: Report Number 3, Commuter Airlines (Washington, D.C.: Commuter Airline Association, July 1975), pp. 11-12

TABLE 5

## AIRCRAFT USED IN THE COMMUTER INDUSTRY AND AIRCRAFT VALUES--1972-1974

Type	1972		1973		1974	
	Number of Aircraft	Value (Million \$)	Number of Aircraft	Value (Million \$)	Number of Aircraft	Value (Million \$)
Fixed Wing	728	116.9	844	156.7	1,042	256.6
Piston	550	42.7	640	53.3	775	73.8
Turboprop	171	64.1	175	65.2	227	125.6
Turbojet	7	10.1	29	38.2	40	57.2
Helicopter	23	8.0	11	3.0	0	
TOTAL	751	124.9	855	159.7	1,042	256.6

SOURCE: Report Number 3: Commuter Airlines (Washington, D.C.: Commuter Airline Association, July 1975), p. 49.

value of various types of aircraft used in the commuter industry as of September 1974, September 1973, and September 1972. This listing provides further amplification of the growth pattern in the scheduled air taxi industry. For example, the number of aircraft used by the third level carriers increased by 13.8 percent from 1972 to 1973; and by 21.8 percent from 1973 to 1974. The dollar value of the aircraft used similarly increased 27.8 percent from 1972 to 1973; and 60.7 percent from 1973 to 1974. Turboprop aircraft increased at a greater rate than piston aircraft from 1973 to 1974--29.7 percent versus 21.1 percent. Perhaps this indicates a preference for the turboprop aircraft which generally offer a larger seating capacity, greater speed, and better consumer acceptance than the piston engine aircraft.

Table 6 lists aircraft, according to manufacturers, that were used in the third level industry as of September 1973 and 1974. The top four manufacturers: Beechcraft, Cessna, Piper, and DeHavilland, supplied 75.6 percent of all aircraft used in the commuter industry in 1974 and 77.7 percent of all aircraft in 1973.

#### Geographic Distribution

Geographically, the commuter industry is concentrated in areas near urbanized population centers. These areas lead in terms of passengers carried and passenger miles flown as is shown by table 7. Figure 3 displays the various FAA regions with the

TABLE 6

## AIRCRAFT USED IN THE COMMUTER INDUSTRY BY MANUFACTURER--1973-1974

Manufacturer	September 1973		September 1974		Percent Change
	Number of Aircraft	Percent of Total	Number of Aircraft	Percent of Total	
Beechcraft	294	34.4	315	30.2	+ 7.1
Cessna	122	14.3	181	17.4	+48.3
Piper	144	16.8	171	16.4	+18.7
DeHavilland	104	12.2	121	11.6	+16.3
Douglas	28	3.3	53	5.1	+89.2
Britten-Norman	31	3.6	39	3.7	+25.8
Dassault	18	2.1	32	3.1	+77.7
Grumman	29	3.4	31	3.0	+ 6.8
Others Combined	85	9.9	99	9.5	+16.4
TOTALS	855	100.0	1,042	100.0	+21.8

SOURCE: Report Number 3: Commuter Airlines (Washington, D.C.: Commuter Airline Association, July 1975), p. 48.



TABLE 7

## COMMUTER AIR CARRIER DOMESTIC PASSENGER TRAFFIC BY FAA REGION--YEAR ENDED JUNE 30, 1974

FAA Region	Passengers (Million)				Miles Flown (Million)			
	Intrastate	Interstate	Total	Percent	Intrastate	Interstate	Total	Percent
New England	.3	.6	.8	17.02	10.6	86.1	96.7	18.71
Eastern	.5	1.6	2.1	44.68	43.4	182.8	226.7	43.86
Southern	.4	.1	.5	10.63	53.5	12.5	66.0	12.77
Great Lakes	.2	.7	.9	19.15	22.3	116.4	138.7	26.83
Central	.1	.2	.3	6.38	7.9	27.5	35.4	6.85
Southwest	.4	.1	.5	10.63	44.6	7.4	52.0	10.06
Rocky Mountain	.1	.0	.1	2.13	12.9	8.5	21.4	4.14
Western	.7	.1	.8	17.02	50.6	22.0	72.6	14.05
Northwest	.2	.0	.2	4.26	18.7	5.8	24.5	4.74
Alaska	.1	.0	.1	2.13	7.5		7.5	1.45
Hawaii	.1	.0	.1	2.13	10.4		10.4	2.01
<hr/>								
TOTAL: 9 Contiguous regions & D.C.	2.8	1.7	4.5	95.57	264.5	234.5	499.0	96.54
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TOTAL: 11 regions & D.C.	3.0	1.7	4.7	100.00	282.4	234.5	516.9	100.00

SOURCE: U.S. Department of Transportation, Civil Aeronautics Board, Commuter Air Carrier Traffic Statistics: Year Ended June 30, 1974 (Washington, D.C.: U.S. Government Printing Office, July 1974), p. 10.



Fig. 3. FAA Regions--Continental United States

exception of Hawaii and Alaska.<sup>1</sup> In addition to domestic operations, the U.S. commuter air carrier industry operates on international and territorial routes.

All mileage in table 7 is non-stop mileage. The data are presented by region and because interstate data are shown under two or more regions or for interstate travel in a region they are double-counted. The percentages presented are the percent of the respective unduplicated total.<sup>2</sup> The percentages add to more than 100 percent because of double counted interstate totals. The totals are unduplicated and therefore will not equal the added totals for interstate and combined intra and inter state totals.

There is a correlation between high population and high levels of commuter airline activity. The same is true for other airline systems, i.e. local and trunkline carriers. The sparsely populated states including South Dakota would perhaps be hard pressed to support a commuter system. However, this doesn't preclude the success of a system that is properly designed and well supported by the traveling consumer.

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<sup>1</sup>A more complete listing containing data on a state by state basis is available in: U.S. Department of Transportation, Civil Aeronautics Board, Commuter Air Carrier Traffic Statistics, Year Ended June 30, 1974 (Washington, D.C.: U.S. Government Printing Office, July 1975), p. 16.

<sup>2</sup>Unduplicated total refers to the totals at the bottom of table 7 which do not reflect double counting as do the figures in the main body of the table.

The commuter airline industry consists of a multitude of diverse operational entities. Each commuter operator, if he is successful, tailors his system to meet the requirements of the cities he serves. Appendix 1 outlines various commuter operations. It displays the diverse ways in which different operators meet the demand for short-haul air transportation. It also shows that diversity is one of the keys to success in this very challenging business.

### Commuter Feasibility

The above review of the commuter industry, its' growth and expansion, areas of operation, and position in the scheduled air transportation industry provides the background necessary to evaluate commuter feasibility in South Dakota. Other issues, however, are also important. Because of the potentially low passenger volume in many South Dakota cities, commuter success may depend on other sources of revenue.<sup>1</sup> Agreements with certified carriers for the relay of passengers to and from commuter carriers may also provide the edge necessary for fiscal survival. Subsequent chapters discuss these and other issues that would directly affect any potential commuter system in South Dakota.

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<sup>1</sup>The most recent attempt to establish commuter operations in South Dakota, Dakota West Airlines, operating between Brookings, SD and Minneapolis, MN, relied solely on passenger and cargo revenues. Apparently because of financial difficulties, they terminated service in the summer of 1974 after operating for approximately six months.

## CHAPTER III

### ISSUES OTHER THAN PASSENGER TRAFFIC

#### AFFECTING COMMUTER FEASIBILITY

Several issues affect commuter feasibility. The number of passengers carried is crucial to success in the commuter airline business. However, other factors can allow an airline to survive while establishing a sufficient passenger market. Fair and equal treatment in transferring passengers to and from the certified carriers and supplemental income derived from cargo and air mail business may affect the survival of a commuter carrier. These issues would affect the feasibility of a South Dakota commuter system.

#### Subsidy

Whether or not third level carriers should be subsidized is of importance to the growth and stabilization of this segment of the airline industry.<sup>1</sup> It may be of such importance that the survival of many of the more than two hundred air taxi companies depend on the subsidy issue.<sup>2</sup>

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<sup>1</sup>The issue of subsidy is not dealt with in terms of its' social equity, fairness, or impacts. It is a reality in the present scheduled air transportation industry because Congress has deemed it necessary for certain segments of the industry, i.e. locals providing service on low-density routes. Commuters may need the same assistance in establishing service on these low-density routes.

<sup>2</sup>Robert Burkhardt, "Why Not Subsidy for Third Levels?," Airline Management, June 1972, p. 37.

### Historical Perspective

Historically, there is a precedent for public payments of direct subsidies in support of air transportation. The segments of the airline industry receiving subsidies have varied in the last twenty years. Up to 1958, the international carriers received subsidies. Domestic trunklines received subsidies until 1959. The local airlines are the only segment of the industry that currently receives subsidy payments.<sup>1</sup>

The Kelly Act of 1925 initiated the system of bidding for mail contracts. However, due to problems with the Act, it was amended in 1926 to decrease postal rates and increase the amount of compensation received by carriers. By 1929, the estimated payments for air mail service exceeded the cost of providing that service by seven million dollars. Thus, the subsidization of airlines was initiated.<sup>2</sup>

Subsequent legislation refined and perpetuated the air mail subsidy system. As a result of the McNary-Waters Act of 1929, the payments to carriers increased. For example, seventeen million dollars were paid out in 1931, and over twenty million dollars were paid out in 1932.<sup>3</sup>

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<sup>1</sup>Ibid.

<sup>2</sup>Martin F. Farris and Ronald Dean Scott, "Airline Subsidies in the United States," Transportation Journal, Summer 1974, p. 27.

<sup>3</sup>Ibid., p. 28.

The Civil Aeronautics Act of 1938 set forth a formal declaration of the national policy concerning the advancement and maturation of the airline industry. The act reaffirmed authorization for the payment of subsidies--referred to as air mail subsidies which are payments in excess of the operating costs of carrying the mail and the expenses incurred in the maintenance of a larger and faster fleet of aircraft which is not warranted by the existing passenger and freight traffic. The rationale used in advancing this policy was that it would assist the airlines and thus promote national defense. In the 1938 act, six policy goals were stated that were and are held to be in the public interest. They are:

1. The encouragement and development of an air transport system adapted to "present and future needs . . .";
2. The fostering of "sound economic conditions" in the industry;
3. The promoting of "adequate, economical, and efficient" air services without "unjust discrimination" or "unfair competitive practices";
4. Competition to the extent necessary to assure the "sound development" of the air transportation system;
5. The promotion of safety; and
6. The "promotion, encouragement, and development" of Civil Aeronautics.<sup>1</sup>

A review of these goals suggests that the commuter industry could very easily fit into the scope of this act. However, the CAB has not seen the need to subsidize the third level industry.

This subsidy system continued until 1951 when a new system of payments for the transportation of mail; known as service mail pay, was initiated by the CAB. Under this system, demonstration of

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<sup>1</sup>Farris and Scott, Airline Subsidies, p. 27.

the need for subsidy depended on the volume of service rendered and the deficit between operating revenues and properly incurred costs. The term "public service revenue" has applied to the last factor.<sup>1</sup>

The direct beneficiaries of subsidy mail pay are the smaller communities. According to the CAB, the subsidy program is designed to insure that air mail service is provided to small communities, not to insure the financial success of a particular airline. If a carrier is unable to convince the CAB of a need for the subsidy, its subsidy can be curtailed.<sup>2</sup>

Subsidies are paid to air carriers in the following manner: Each is subsidized an amount equal to its direct operating costs plus 30 to 100 percent of its indirect operating costs for a particular trip (See Chapter V for a discussion of direct and indirect costs.). Costs per mile and indirect cost coverage rates are determined by the CAB. In addition, a revenue growth sharing plan brings about a reduction in subsidy--this can be as much as 3.5 percent per year on subsidy eligible routes.<sup>3</sup> In other words, if a subsidized route exhibits a revenue growth, the subsidy for that route may be decreased by as much as 3.5 percent per year.

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<sup>1</sup>Ibid., p. 29.

<sup>2</sup>Ibid., p. 30.

<sup>3</sup>Ibid.



### Subsidy and the Third Level Carrier

The importance of subsidy to the commuter industry is a hotly contested issue. That controversy and the implications of subsidization are discussed in this section. In addition, the conclusions of two studies completed in adjoining states which include discussions of commuter subsidy are outlined.

One usually thinks of subsidy in terms of monetary payments to a particular airline. However, there are a variety of more subtle forms of subsidy that many third level carriers could receive. For example, a community might not charge the commuter for snow removal, terminal space, or landing fees. Other forms of preferential treatment such as guaranteed loans, could also be offered. While not direct cash payments, these services affect the cost and profit situation for a particular carrier.<sup>1</sup>

One notable experiment where subsidy was used in the commuter industry was the flow-through experiment arranged between Air Midwest and Frontier Airlines.<sup>2</sup> A subsidy was awarded for Air Midwest service to the communities of Dodge City, Great Bend, and Hutchinson, Kansas in August of 1973, as a two-year experiment.<sup>3</sup>

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<sup>1</sup>Robert Burkhardt, "Why Not Subsidy for Third Levels?," Airline Management, June 1972, p. 37.

<sup>2</sup>Flow through subsidy refers to the payment of subsidy to a third level carrier for flying routes certified for service by a local carrier by the CAB. The subsidy "flows-through" the local carrier to the third level operators.

<sup>3</sup>James A. Pickett, "Flow Through Subsidy After First Year," in Local Air Transportation Yearbook--1975 (San Francisco, Cal.: Miller Freeman Publications, 1975), p. 63.

From Air Midwest's standpoint, the experiment was successful. Coupled with the energy crisis which increased the use of air transportation, subsidy allowed the airline to enjoy a profitable year. Comparing year end statistics for 1973 and 1974 reveals some notable gains: passenger boardings were up 22.5 percent; passenger revenue miles increased 18.8 percent; and the annual load factor increased by 2.7 percent. Passenger revenues and gross income increased by 39.5 percent and 44.6 percent, respectively, while expenses rose 23.7 percent.<sup>1</sup>

The experiment allowed for the saving of \$300,000 in subsidy--this was the difference in the amount paid Air Midwest and the amount that would have been paid to Frontier for this route. The cities being served received a greater quality and quantity of scheduled air service. These achievements can be interpreted as meeting the objectives of the Civil Aeronautics Act of 1938 which guide the use and implementation of the subsidy system.<sup>2</sup>

The Air Midwest flow-through experiment was contested by the Airline Pilots Association (APA) and the National Association of Bus Owners who filed for a review of the CAB decision to award the subsidy in the U.S. Court of Appeals in the District of Columbia. The APA felt the experiment violated contracts they had with Frontier Airlines. The Bus Owners thought the subsidy gave

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<sup>1</sup>Ibid.

<sup>2</sup>Browne, Remarks Before the Joint Luncheon of the Kiwanis Club and the Chamber of Commerce, p. 8.

Air Midwest an unfair and illegal competitive advantage. The appellate court approved the appeal in favor of the APA and Bus Owners in July of 1975 and the experiment was halted.<sup>1</sup>

Thus, the subsidization of non-certified commuter carriers remains a controversial issue. The need for an equitable, feasible, and workable policy of subsidization could be considered one of the priority items facing the national air transportation system.

#### Subsidy Proposals

Secor D. Browne, Chairman of the CAB in 1972, outlined six alternatives that could be used in meeting the need to provide service to small communities.

1. Change or completely abandon the subsidy class rate.
2. Seek a subsidy increase.
3. Implement a non-Federal subsidy program.
4. Directly subsidize air taxi/commuter air carriers.
5. Institute a contract bid system.
6. Maintain the status quo.<sup>2</sup>

From this list, Mr. Browne advocated the use of option five as the most feasible and potentially successful. Specifically, to determine whether or not the system is workable, the Board would authorize the taking of bids and the granting of contracts without

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<sup>1</sup>"Flow Through Subsidy," Aviation Week & Space Technology, July 21, 1975, p. 28.

<sup>2</sup>Browne, Remarks Before the Joint Luncheon of the Kiwanis Club and the Chamber of Commerce, p. 8.

certification, on an experimental basis. Contract bidding procedures would be designed to eliminate unrealistic bids and renegotiation of contracts would be expressly forbidden. Also, each participant would be required to provide performance bonds or comparable financial guarantees that would assure contract completion or provide immediate funds for the services of a substitute operator.<sup>1</sup>

The FAA would insure that all participants maintained their equipment in accordance with established regulations and that air crews were qualified. The CAB staff and the communities involved would meet and develop service systems satisfying community needs. Browne contended that with the proposed system, subsidy expenditures would be more closely tied with the provision of services rather than to an entire route system as is now the case with the local carriers.<sup>2</sup>

#### Wyoming Study

A study done for the Wyoming Department of Economic Planning and Development concerning the economic feasibility of providing commuter service in that state proposed a similar plan. The authors stated that legislative authorization could be given the State Aeronautics Commission to develop requirements for a third level route system and then advertise for and receive sealed bids.

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<sup>1</sup>Ibid., p. 13.

<sup>2</sup>Ibid.

contract. The plan would include precise specifications concerning route patterns and connections with intrastate, regional, and trunkline routes. After discussion, the interested Federal agencies (CAB and The Department of Transportation) declined to participate. However, the State of North Dakota decided to continue study on the project using state funds.<sup>1</sup>

As to the current status of the plan, the 1975 North Dakota Legislature authorized approximately \$50 thousand for a "Needs Assessment Study."<sup>2</sup> The University of North Dakota School of Business Administration and Aeronautics Department are combining their efforts to distribute forty thousand questionnaires to ascertain who would use the proposed system.

#### Adams' Proposals

Mr. John G. Adams, a member of the Civil Aeronautics Board in 1970, proposed two alternative solutions to the problem of providing adequate service to small communities. Both options would use financial incentives, i.e. subsidies, as an operational necessity.<sup>3</sup>

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<sup>1</sup>William H. Gregory. "Small Community Service Plans Proposed." Aviation Week & Space Technology, November 19, 1973.

<sup>2</sup>Telephone interview with Mr. Harold V. Vavra, Director, North Dakota Aeronautics Commission, Brookings, South Dakota, 18 July 1975.

<sup>3</sup>Adams, Remarks Before the Association of Local Transport Airlines, pp. 5-7.

The first option advocated the large scale use of small aircraft by local carriers in serving the smaller communities on its route system. Evidently he didn't feel this option would be desirable because he failed to argue for it. The second proposal involved large scale substitution of commuter type airlines on routes being operated at a loss by the local carriers. Under this option, Adams envisioned a system in which the local carriers would provide administrative services, retain certification for their routes, and have responsibility for resuming service if the substitutes failed to provide the required service. The local carrier would be paid by the CAB for the administrative duties and sufficient subsidy would be paid the third level carrier to allow reasonable profits. Through community participation, the plan might also include subsidy in the form of favored treatment for the commuter at municipal airport facilities.<sup>1</sup>

What Mr. Adams proposed in the second option is, in essence, the flow-through subsidy concept. The reader will recall that such a system, tried on an experimental basis by Air Midwest, was declared illegal by the U.S. Court of Appeals, District of Columbia in July of 1975 (see page 47).

#### Minnesota Study

The State of Minnesota has also conducted a study concerning the provision of scheduled air transportation to areas outside the

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<sup>1</sup>Ibid.

Minneapolis-St. Paul metropolitan area. From the results of this study, it was suggested that consideration be given to implementing a plan advocating state and community involvement in the subsidization of commuter operators. The plan suggests a grant system to individual communities rather than direct payments to air carriers. This grant would cover up to two-thirds the amount of direct financial aid expended by communities for the benefit of commuter carriers. Subsidy funds would be generated from airline flight property taxes, aviation fuel taxes, and aircraft registration fees.<sup>1</sup>

The possibility of private enterprise involvement in commuter air carrier service subsidization was also mentioned in the Minnesota study. Examples of breakeven guarantees negotiated between commuter operators and large companies in New Ulm, Minnesota, and Georgia were cited. The Georgia agreement was only for a period of six months. Generally speaking, that would be an insufficient amount of time to establish a system capable of operating without subsidy.<sup>2</sup>

#### Importance to South Dakota

Subsidization should be considered in evaluating commuter feasibility in South Dakota. The adoption of one plan or a

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<sup>1</sup>Gregory, "Small Community Service Plans Proposed," p. 28.

<sup>2</sup>R. Dixon Speas Associates, Minnesota State Aviation System Plan--Scheduled Air Transportation for Outstate Areas (Minneapolis-St. Paul: R. Dixon Speas Associates, May 1974), p. 36.

combination of several, to fit the specific needs of a South Dakota system, should be included in the evaluation process. Because of the low density markets a commuter would serve, it appears that a South Dakota system would require subsidy.

Subsidization of commuter airlines should help lower the overall subsidy bill of the government. In many cases, commuters take over routes that have been flown by the local carriers who were receiving subsidy. The cost of subsidizing these local carriers would most likely decrease because they wouldn't continue to fly these short, unprofitable, subsidized routes.

Commuter airline subsidization would provide an environment of reasonable security and stabilization for a commuter operator which would enable him to establish a market, gain credit, and solidify his position. Subsidy might subsequently be removed as the commuter reached a position of financial independence.

#### Joint Fares

The issue of joint fares, like the question of third level subsidy, is of importance to the perpetuation of the third level industry and its full incorporation into the national air transportation system. The principle of joint fares, the pros and cons of third level participation in joint fare agreements, and the CAB policy concerning joint fare agreements between two carriers--the fare charged when a passenger transfers from one carrier to another in the process of traveling to his destination--are outlined in this section.



In general terms, when a passenger travels on the exclusive routes of a single carrier he pays the fare at or near the level charged for non-stop service regardless of the number of enroute stops or how many "on-line" connections are made. On the other hand, when a traveler undertakes a journey which involves changes between two or more carriers (joint fares), the fare paid may vary considerably.<sup>1</sup> The effect of joint fares on the economic well-being of the air traveler can prove to be an economic liability to the competitive position of the third level carrier when its passengers connect with flights flown by certified carriers.

The entire joint fare issue was dealt with during the course of a domestic passenger fares investigation conducted in 1972 by the CAB. At the completion of the investigation, the CAB published its policy concerning joint fares. Eight articles of policy were put forth defining the Board's regulation of joint fares. The decision was directed only toward the certified industry.<sup>2</sup>

In its decision the Board stated that joint fares would no longer be left to the discretion of various carriers. Effective June 11, 1972, the Board required the publication of joint fares for all markets in the 48 contiguous states and the District of

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<sup>1</sup>Randall P. Bennett, Chief, Domestic Passenger Fares Section, Civil Aeronautics Board, to Tom Hruby, Brookings, 9 August 1975, Explanation of Joint Fares.

<sup>2</sup>U.S. Department of Transportation, Civil Aeronautics Board, Docket 21866-4, Domestic Passenger Fare Investigation, Phase 4-- Joint Fares (Washington, D.C.: U.S. Government Printing Office, March 18, 1974), p. i.

Columbia for all passengers traveling on domestic connecting flights being flown by certified carriers. The third level industry was not included in the decision.<sup>1</sup>

#### NATC Petition

In July of 1972, the National Air Transportation Conference (NATC) petitioned the Board to allow the third level industry to be included in the joint fares system. The basic drive of the petition concerned two points. First, it was contended that the principle which required joint fares between certified carriers, applied also to services between commuter and certified carriers. Second, the petitions contended that unless they were allowed to participate in the joint fares system, it would place them in a potential financial crisis.<sup>2</sup>

The NATC argued that the decision placed a great segment of the traveling public in an unjust position. Specifically, they stated that,

. . . the failure of the Board to require the application of its principles governing joint fares to commuter connecting passengers not only discriminates against that area of public travel and prejudices the hundreds of communities served by commuters, but in addition results in severe economic disadvantages to commuter air carriers, individually and as a class, which casts a heavy cloud on the continuing viability of their services and operations

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<sup>1</sup>Joan M. Feldman, "Joint Fares for the Third Level," Airline Management, August 1972, p. 37.

<sup>2</sup>U.S. Department of Transportation, Civil Aeronautics Board, Order 73-9-44 (Washington, D.C.: U.S. Government Printing Office, September 11, 1973), p. 2.

designed to bring transportation to the smaller communities of the nation.<sup>1</sup>

The commuters further stated that if they are to remain fiscally strong and capable of replacing local service routes--thus reducing the subsidy expenditure--they must not be forced to operate without the benefits of the Phase 4 directives. They also argued that in order to serve in the greater public interest, joint fares must be extended to all air travelers, including those who use third level carriers.<sup>2</sup>

#### Certified Carriers Opposition

The certified carriers counter-argued that because the commuters never came forth to participate in the Phase 4 proceedings, thus indicating a lack of interest or professional sophistication, they were not covered under the ruling. They also contended that the then current practice or system of voluntary joint fares between commuters and certified carriers was adequate and should not be expanded. Finally, they contended that joint fares with the commuters cannot become mandatory unless the Board changes its policies and drastically increases its regulations of the third level industry.<sup>3</sup>

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<sup>1</sup>Ibid.

<sup>2</sup>Feldman, "Joint Fares for the Third Level," p. 37.

<sup>3</sup>U.S. Civil Aeronautics Board, Order 73-9-44, pp. 4-5.

## CAB Decision

The Board, in reviewing the petition from the NATC and remarks from the certified carriers, decided the following:

1. The Phase 4 decision has no direct application to the NATC petition concerning the joint fares. That particular decision determined that it was unjust for the certified carriers to charge a combination of local fares for interline travel. If the issue were to be directed towards the third level industry, completely new hearings would be required.
2. The predictions of financial crisis mentioned in the petition did not correspond to statistical verification. For example, passenger boardings had shown a steady increase for the commuter industry. In addition, to require reduced joint fares, at that time, may have further reduced overall airline revenues and eventually lead to increased rates.
3. Joint fares should continue to be negotiated on an individual basis between commuter and certified carriers. If legal issues of discrimination (unreasonableness, prejudicial treatment) are uncovered in reference to the unavailability of joint fares on a particular market, the issue can best be handled on an individual basis.<sup>1</sup>

The joint fares policy of the CAB continues to follow these guidelines. Therefore, the issue remains a point of debate and the impact of the lack of joint fares for all commuters remains a matter of opinion. However, as was mentioned in the section discussing various types of commuter operations, those commuters who aggressively seek joint fares agreements with certified carriers are able to obtain them.

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<sup>1</sup>Ibid., pp. 5-6.

### Importance to South Dakota System

This issue is important to the potential success of a South Dakota commuter system. It is essential that consumers using a commuter system be able to transfer to other carriers without being penalized for flying the commuter--ticket costs would be higher if joint fares agreements were not in effect between carriers. Although not absolutely essential, joint fares agreements would allow a South Dakota commuter to offer more economic, convenient, and generally better air transportation, and assimilate more fully into the regional air transportation system.

### Air Mail

The transport of mail by a commuter carrier can have very positive impacts upon the financial solvency and stability of the operator. One only has to review the figures listed in table 2, page 31, to realize that the commuter industry is hauling more mail each year. Some commuter operators, like Air Wisconsin, have diversified and achieved better aircraft utilization by having night air mail routes. In this section, the issues concerning the impact of air mail business on commuter operations are discussed.

The air taxi mail program, which is operated by the U.S. Postal Service, has had a stabilizing effect on the commuter airline industry. The program, which was initiated in 1964, is meeting the needs of the Postal Service to move mail among smaller towns not served by certified carriers. It also is used to transport mail

between larger cities where certified carrier schedules do not meet the need of moving mail late at night.<sup>1</sup>

In 1972, more than 95,000 miles and nine hundred stops were flown on air taxis' mail routes on a daily basis. The number of routes had increased from eighty in 1967 to 168 in 1972, a 110 percent increase.<sup>2</sup>

The program was originally conceived as the replacement for passenger trains whose schedules had decreased to the point of cessation of service in the 1960's--South Dakota, for example, no longer has any passenger train service. Implementation of the program also helped to offset the reduction of scheduled air service to small communities brought about by the acquisition of jet transports by the local carriers. Almost all air taxi mail flights operate between the hours of 10 p.m. and 4 a.m. The lack of airline flights during these hours necessitated the extensive use of air taxi and commuter operators.<sup>3</sup>

All contracts under \$300,000 are negotiated through regional Postal Service offices. Contracts are issued for two or four year intervals but either the Postal Service or the operator can terminate the agreement with 30 days notice. This most likely would occur only if a certified carrier scheduled a route which competed with

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<sup>1</sup>Craig Covault, "Air Taxi Mail Growth Stabilizes Carriers," Aviation Week & Space Technology, December 11, 1972, p. 29.

<sup>2</sup>Ibid.

<sup>3</sup>Ibid.

the commuter route. However, failure of the operator to perform in accordance with the terms of the contract would also be grounds for termination.<sup>1</sup>

One can see how air mail contracts would stabilize a commuter's financial picture. They allow for a better utilization of aircraft and provide a steady flow of dependable income into a business. This would be a very important consideration for any operational commuter system in South Dakota.

#### Air Cargo

The shipment of freight or express by air has become an important element in the air transportation industry. For many air commuter operators, it comprises an ever increasing share of their business. The amount of cargo carried by the commuter industry has increased dramatically as the industry developed--see table 2, page 31. Cargo carried by commuter carriers increased 152.2 percent from 1970 to 1974. In South Dakota, the amount of freight and express transported by the carriers serving the state increased 1651 tons or 544.8 percent from 1962 to 1974 (see table 19, page 102). The point of this is that cargo business can supplement and enhance the financial stability of an operator.

Trends are developing in the make-up of the air cargo business and in the expansion and redistribution of industrial production to small towns and cities which point toward an increase

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<sup>1</sup>Ibid., p. 31.

in air cargo business for commuter carriers.<sup>1</sup> The growth of light industry in the Aberdeen and Brookings areas are prime examples of this phenomenon.

The developments are occurring because of the following:

1. The trend of reducing or eliminating passenger flights into small communities by local and trunk-line carriers virtually eliminates the option of transporting air cargo on a timely basis.
2. With the increasing cost structure brought about by rising fuel prices and general inflation, all-cargo service (flights carrying only cargo) is being reduced or discontinued.
3. The rigid flight schedules of trunk and local carriers restrict the flow of overnight freight service to important sites. Almost total grounding of the air cargo lift capacity occurs during the night hours. It is estimated that 65 percent of the entire U.S. airline fleet is not used during the night.
4. There is increasing concern over the carrying of hazardous cargoes on passenger flights.<sup>2</sup>

Various approaches have and will be used by aviation entrepreneurs to capture a portion of this neglected and underserved market. Air Wisconsin, for example, displayed an increase in its cargo business of 101.7 percent from 1970 to 1973 (see table 23, page 136). Other commuters have done as well. Republic Airlines, operating out of St. Louis, specializes in the transport of anything from dangerous chemicals to radio-active materials. Specially trained personnel handle the cargo both on the ground and

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<sup>1</sup>Charles E. Schneider, "Carrier Seeks Small Air Package Control," Aviation Week & Space Technology, July 21, 1975, p. 36.

<sup>2</sup>Ibid.



in-flight.<sup>1</sup> Federal Express Corporation specializes in the overnight delivery of small packages--weighing seventy pounds or less. The company not only transports the cargo by air, but it also picks up and delivers the packages.<sup>2</sup>

The opportunity for continued increases in the transportation of mail and cargo by commuter airlines appears good. These sources of revenue would help in the growth and stabilization of commuter carrier operations thus improving the opportunities for successful commuter passenger services.

In South Dakota, there is only one air taxi operator flying air mail routes in the state.<sup>3</sup> There are no all-cargo operators. If service were curtailed to certain cities by the certified carriers in the state, the need for substitute service would be great. An adequate commuter system could easily step in and fill this gap.

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<sup>1</sup>Erwin J. Bulban, "New Airline to Carry Hazardous Cargo," Aviation Week & Space Technology, August 18, 1975, p. 31.

<sup>2</sup>Schneider, "Carrier Seeks Small Air Package Control," p. 40.

<sup>3</sup>Telephone interview with the Federal Aviation Administration's General Aviation District Office of Rapid City, South Dakota, Brookings, South Dakota, 14 January 1975.

## CHAPTER IV

### USERS AND FACTORS AFFECTING THE USE OF SHORT-HAUL AIR TRANSPORTATION

A discussion of potential users of a short-haul or commuter airline system is presented in this chapter. The information presented describes the factors that will affect usage patterns and consequently the possible success of any commuter system in South Dakota.

#### Users of Short-Haul Transportation

The potential traveler in the short-haul market is often-times on a business trip. It has been estimated that a large percent of airline passengers travel on business and are frequent users of this mode of transportation.<sup>1</sup> In 1961, a survey by North Central Airlines found that 56 percent of its passengers were on business or military orders. An Ozark Airlines study, conducted in 1960-1972, found that 80 percent of its passengers were traveling on business. In addition, the study found a strong correlation between the number of trips made per passenger, and whether or not the

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<sup>1</sup>Recent information gained from North Central Airlines indicates that approximately 75 percent of their passengers are traveling on business. However, it was noted that in the past 8-10 years, as personal disposable income has increased throughout the country, more consumers are using airlines for personal travel. This trend is much more pronounced on routes that serve traditional vacation areas, i.e. Florida, Arizona, Southern California, Hawaii, etc. Telephone interview with Jon Harty, North Central Airlines Inc., Brookings, South Dakota, 23 August 1976.

passenger was traveling on business. For example, greater than 25 percent of the business passengers included in the study made from six to seventeen trips a year. Another 25 percent of the sample group made between eighteen and sixty-five trips yearly while 11 percent made more than sixty-five trips.<sup>1</sup>

### Factors Affecting Short-Haul Demand

Three primary factors affect the demand for short-haul air transportation in comparison to alternative modes of transportation: price, speed, and frequency of service.

#### Price

Eads contended that the demand for air transportation varies with the length of trip and is inelastic for short-haul trips.<sup>2</sup> This opinion was also presented by Robert E. Peach, president of Mohawk Airlines in testimony before a congressional committee in 1966. He states

It is our contention, based on 20 years of experience that a 5-10 percent reduction in short-haul fares will not stimulate traffic more than a minor amount--if at all--that short-haul air passengers are primarily business

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<sup>1</sup>Eads, The Local Service Airline Experiment, p. 14.

<sup>2</sup>Eads' conclusions are based on his review of various studies examining the relationship of the demand for short-haul air service to price including: A Study of the Domestic Passenger Air Fare Structure by Civil Aeronautics Board; The Value of Time in Passenger Transportations: The Demand for Air Travel by Rueben Gronau; and Peak-Load Pricing and Optimal Capacity under Indivisibility Constraints by Oliver Williamson. For Eads' full summary and credits see: Eads, The Local Service Airline Experiment, pp. 16-21.

oriented. They respond not to a dollar or so fare reduction but (to) the frequency and timing of flight schedules, quality of reservation services, and the like.<sup>1</sup>

Mr. David Moran of North Central Airlines states a similar viewpoint.<sup>2</sup> He states that North Central has found that the South Dakota air transportation passenger travel is very price inelastic. In a six month run of special fare price discounts for intrastate, intercity travel, no significant change in travel occurred during the fare reductions.<sup>3</sup>

Although most short-haul air travelers are on business, local service airlines have tried to attract more price sensitive consumers. Special rates for group, family, week-end, and standby travel have been used with some success. Special care is usually taken, however, to exclude business travelers from qualifying for these rate reductions.<sup>4</sup> These and other marketing techniques could be used by commuter operators to increase load factors, increase week-end aircraft use, and generally diversify the carriers' consumer groups.

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<sup>1</sup>Ibid.

<sup>2</sup>Interview with Jon Harty and David E. Moran, North Central Airlines, Inc., Minneapolis, Minnesota, September 5, 1975.

<sup>3</sup>The fare reduction was used on round-trip fares and was the price of a one-way ticket plus one-dollar.

<sup>4</sup>Eads, The Local Service Airline Experiment, p. 20.

### Speed of Air Travel

The main advantage offered by air travel is its speed. The amount of utility placed on the speed of travel and maximum utilization of working hours would influence demand for air transportation.

The amount of time required to fly can be subdivided into two categories. They are: 1) the time it takes to travel to and from the airport or terminal; and 2) the actual flying time between the departure and arrival points including intermediate stops. This time will vary of course, depending on the community, the distance from the users' homes to an air terminal, and the layover time at intermediate stops.

In South Dakota, with current service patterns, the advantage of speed would be of little use in such markets as Brookings--Sioux Falls, Brookings--Watertown, Mitchell--Sioux Falls, Mitchell--Huron, Watertown--Aberdeen, and perhaps even Huron--Aberdeen. The automobile would and does compete extensively with short-haul flights among these cities. The only factor that would perhaps change this pattern is better scheduling and increased frequencies. Their importance in the commuter airline scheme is discussed below.

### Frequency of Service

The frequency of scheduled flight service is probably the single most important factor affecting the use of short-haul air transportation. Eads found that out of the 124 localities exclusively served by local carriers where traffic levels dropped between

1968 and 1969, flight frequencies had fallen at 101 of them. His data demonstrated that reduction of flight frequencies of 11 percent was mirrored by an 11 percent reduction in traffic. He contended that the decrease in flight frequencies brought about the reduction of traffic.<sup>1</sup>

A review of the scheduled departures and number of passengers carried in South Dakota for specific years does not support Eads' conclusions. While per-day boardings increased 212.7 percent from 1962 to 1974, the scheduled departures increased less than 1 percent (tables 8 and 9). Individual service points displayed even more dramatic contrasts. Brookings, for example, experienced a 39.1 percent decrease in scheduled departures from 1962 to 1974. Passenger traffic increased 24.5 percent over the same time period. Mitchell experienced a 39.3 percent decrease in scheduled departures and a 33.3 percent increase in passenger boardings over the time period 1962 to 1974.

Only Rapid City and Sioux Falls experienced increases in scheduled departures as well as passenger boardings. The remaining service points, with the exception of Huron, all increased their boarded passengers while scheduled departures decreased from 1962 to 1974.

One can see that South Dakota, like the nation as a whole, is using air transportation at increased levels. The demand for

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<sup>1</sup>Ibid., p. 25.

TABLE 8

## SCHEDULED DEPARTURES FOR SOUTH DAKOTA

Service Points	1962	1965	Percent Change 1962-65	1970	Percent Change 1965-70	1974	Percent Change 1970-74	Percent Change 1962-74
Aberdeen	2,912	2,877	- 1.2	2,726	- 5.0	2,451	-10.1	-15.8
Brookings	2,184	1,341	-38.6	1,054	-21.4	1,330	+26.2	-39.1
Huron	1,913	2,815	+47.2	2,183	-22.5	694*	-68.2	-63.7
Mitchell	2,186	1,543	-29.4	1,660	+ 7.6	1,327	-20.1	-39.3
Pierre	2,811	3,072	+ 9.3	3,360	+ 9.4	2,792	-16.9	- 1.0
Rapid City	3,520	4,201	+19.3	5,891	+40.2	4,655	-20.9	+32.2
Sioux Falls	8,453	10,323	+22.1	12,547	-21.5	12,019	- 4.2	+42.2
Watertown	2,912	2,877	- 1.2	2,734	- 4.9	2,709	- 1.0	- 6.8
Yankton	1,456	1,460	+ 0.2	1,390	- 4.8	1,395	+ 0.4	- 4.2
TOTALS	29,347	30,509	+ 3.9	33,545	+ 9.9	29,372	-12.4	0.0

SOURCE: U.S. Department of Transportation, Civil Aeronautics Board, Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended June 30, 1962 (Washington, D.C.: U.S. Government Printing Office, 1962), pp. 172-73; U.S. Department of Transportation, Civil Aeronautics Board, Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended December 31, 1965 (Washington, D.C.: U.S. Government Printing Office, 1966), p. 144; U.S. Department of Transportation, Civil Aeronautics Board, Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended June 30, 1970 (Washington, D.C.: U.S. Government Printing Office, 1970), p. 143; and U.S. Department of Transportation, Civil Aeronautics Board, Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended June 30, 1974 (Washington, D.C.: U.S. Government Printing Office, 1974), p. 98.

\*Huron airport was closed for construction from May 20 to June 17.



TABLE 9

## SOUTH DAKOTA AVERAGE PER DAY AIRLINE PASSENGER BOARDINGS

	1962	1965	Percent Change 1962-65	1970	Percent Change 1965-70	1974	Percent Change 1970-74	Percent Change 1962-74
Aberdeen	43.8	53.5	+22.1	65.0	+21.5	79.2	+21.8	+ 80.8
Brookings	5.3	6.1	+17.3	6.1	0.0	6.6	+ 0.8	+ 24.5
Huron	19.6	21.9	+11.7	24.8	+13.2	11.1*	-55.2	- 43.4
Mitchell	7.8	7.3	- 6.0	9.1	+24.7	10.7	+14.3	+ 33.3
Pierre	21.6	37.6	+74.1	63.1	+67.8	95.7	+51.7	+343.1
Rapid City	111.5	124.4	+11.6	237.6	+91.0	327.4	+37.8	+193.6
Sioux Falls	157.1	250.7	+59.6	465.5	+85.7	621.2	+33.4	+295.4
Watertown	13.7	19.1	+39.4	28.4	+48.7	41.2	+45.1	+200.7
Yankton	5.1	7.3	+43.1	8.9	+21.9	12.7	+42.7	+149.0
TOTALS	385.5	527.9	+37.0	908.5	+72.1	1205.5	+32.7	+212.7

SOURCE: U.S. Department of Transportation, Civil Aeronautics Board, Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended June 30, 1962 (Washington, D.C.: U.S. Government Printing Office, 1962), pp. 172-73; U.S. Department of Transportation, Civil Aeronautics Board, Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended December 31, 1965 (Washington, D.C.: U.S. Government Printing Office, 1966), p. 144; U.S. Department of Transportation, Civil Aeronautics Board, Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended June 30, 1970 (Washington, D.C.: U.S. Government Printing Office, 1970), p. 143; and U.S. Department of Transportation, Civil Aeronautics Board, Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended June 30, 1974 (Washington, D.C.: U.S. Government Printing Office, 1974), p. 98.

\*Huron airport was closed for construction from May 20 to June 17.

NOTE: Average passenger boardings were computed by dividing the total number by 365 for each locality.



scheduled air transportation in South Dakota appears to be relatively unaffected by service frequency. In the case of South Dakota, a reasonable hypothesis would be that factors other than frequency have obscured the relationship that usually exists between frequency of service and passenger boardings. During the 1962-1974 period, South Dakota's air carrier communities experienced population increases, higher per-capita disposable incomes and changing labor forces with more business and professional positions. These factors, along with the general increase in the acceptance of air transportation could explain the increases in passenger boardings while frequency was declining at many points. However, even in South Dakota it is probable that better scheduling and increased frequency of service would increase the level of passenger traffic at service points in the state, especially the low density points. A commuter carrier could provide this increased frequency.

If one looks to other areas where commuters have successfully provided service, the traffic level has almost always increased. Much of this increase can be tied to increased frequency of service, especially when a commuter takes over routes formerly served by local carriers and increases the frequency of service. For example, traffic levels increased from 1968 to 1974, in all but three of the twenty-seven communities Allegheny Airlines turned over to its commuter operators who offered increased frequencies.<sup>1</sup> Air Midwest experienced similar gains over their entire system serving small

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<sup>1</sup>Ellingsworth, "Allegheny System Aids Local Operators," p. 71.

formerly served by Frontier Airlines. With increased frequencies they were able to board over three hundred passengers in one month in 1971, out of a service point--Dodge City--that had averaged about fifty when served by Frontier.<sup>1</sup>

Eads argued that increased frequency of service will increase the level of traffic when he stated:

. . . the experience of air taxis has reinforced the belief that frequency of service is more important than ticket price in attracting traffic in short-haul markets where good travel alternatives exist. In almost every case the air taxis have emphasized frequency as the main selling point of their service.<sup>2</sup>

This evidence suggests, but does not prove, a correlation between frequency of service and passenger traffic in the short-haul market. Even though South Dakota has not demonstrated a decrease in traffic as frequencies have decreased, perhaps greater traffic could be generated with increased frequencies. A system would have to actually go into service before a definitive evaluation of the South Dakota market could be made, i.e. an experimental system.

#### Summary

Commuter airlines can expect travelers on business to be their primary source of passenger revenue. A potential South Dakota commuter must design its route structure to accommodate this group of consumers and concentrate on providing the type of service they

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<sup>1</sup>Wayne W. Parish, "Air Midwest: The Black Ink Commuter," Airline Management, September 1971, p. 32.

<sup>2</sup>Eads, The Local Service Airline Experiment, p. 25.

desire, i.e. high frequency of flights. If they do this, other potential consumers will most likely use the system because the quality of service will be sufficient to satisfy their demands for personal travel.

Although the South Dakota data do not demonstrate a correlation between frequency of service and passenger boardings-- higher frequency usually results in greater short-haul air travel. Perhaps South Dakota hasn't truly developed a demand for the short-haul route, i.e. travelers, including businessmen, are traveling longer distances than those considered short-haul in nature. The relatively low level of industrial activity in the state hasn't produced business travelers in numbers sufficient to support short-haul service. However, as more and more industry settles in the state, the demand for and use of short-haul systems may increase.

## CHAPTER V

### ESTIMATED OPERATING COSTS AND POTENTIAL IMPACTS OF A COMMUTER SYSTEM IN SOUTH DAKOTA

Estimated costs associated with the operation of an airline are defined and discussed in this chapter. In addition, the estimated operating costs for various aircraft which are potentially applicable to a South Dakota commuter system are presented. Comparisons are made between aircraft used by North Central Airlines in South Dakota and aircraft specifically designed for commuter service. A hypothetical service route is used as the basis for the comparison.

Potential impacts of a commuter system are also examined in an attempt to identify possible ramifications of commuter airline service. The impacts are broadly stated in order to distinguish areas and groups affected by this potential system.

#### Costs of Operating an Airline

The operating expenses for an airline are broken down into two primary categories; direct costs and indirect costs.<sup>1</sup> Direct costs are those for the flight crew, fuel and lubricants, direct maintenance on the aircraft, and depreciation expenses on a per-hour

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<sup>1</sup>These cost categories are not wholly consistent with the economic concepts of fixed and variable costs. Fixed costs for an airline would include: interest, property taxes, insurance, and depreciation. Variable costs would include: wages, fuel and lubricants, non-scheduled maintenance, and promotion and sales expense.

basis for any particular aircraft. Indirect costs are costs for passenger service, aircraft and passenger servicing, promotion and sales, and administrative and clerical expense. A brief discussion of the make-up of these costs will allow a better understanding of their scope and impact on the potential feasibility of a commuter system in South Dakota.

According to equations derived by Mentzee and Nourse and called the ATA formulas,<sup>1</sup> direct operating costs comprise from 50 to 60 percent of total operating expenses.<sup>2</sup> These costs vary due to several factors. Such things as employee unions, fuel grades and taxes, operating locations, and size of operation affect this variable. Each potential operator would have to estimate the effects of these factors given a particular aircraft and route system.

Indirect costs--costs which are incurred in serving and supporting passenger movement and comfort--plus the costs for support and administrative personnel, plant, and equipment comprise from 40 to 50 percent of total operating costs. Such things as liability insurance, aircraft and traffic handling personnel, landing fees, record keeping and clerical personnel, advertising, and executive personnel fall under this component.

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<sup>1</sup>ATA formula refers to Air Transport Association Standard Method of Estimating Comparative Direct Operating Costs of Transport Airlines.

<sup>2</sup>Eads, The Local Service Airline Experiment, p. 50.

Because of the relatively small size of a commuter operation, many of these functions and jobs which are related to operating costs can be performed by a few personnel, each working in more than one capacity. This allows for a decrease in overall operating expense, especially in terms of support and administrative personnel. The prospective operator would have to gauge the size of his operation to fit the route system and thus achieve the greatest economies to scale and the lowest costs whenever possible.

#### Evaluating Commuter Aircraft Operating Costs

The following analysis is designed merely to identify potential aircraft that might be used on routes of various stage length and between various city pairs. Both of these variables are of primary importance in choosing the right aircraft for a commuter system.

The application of the direct and indirect cost components to a particular aircraft can be used as a test for deciding which one or ones would be acceptable for a South Dakota market. For this process we will assume that two primary vehicles would be realistic for serving the low density market at many cities in South Dakota. Depending on the stage length as well as the city pairs being served, the capacity of the aircraft should be from 8 to 20 passengers or 20 to 30 passengers. Larger aircraft would have excess seating capacity which would be wasted on the short routes.

The aircraft selected for evaluation were picked according to seating capacity, performance, cost, and present use in the commuter industry. Because of the varying aircraft costs for new and used aircraft and when buying or leasing aircraft, the cost of the plane was not a critical factor in choosing it for the analysis. However, the acquisition cost would be important when and if an aircraft were to be selected to serve a particular route system. Table 10 lists both direct and indirect estimated costs for the selected aircraft. The cost estimates presented are general approximations of actual costs which would vary according to a multitude of factors affecting a particular operation.

Table 11 lists various performance parameters for the aircraft listed in table 10. The speed, load capacity, and range data allow a better comparison of the aircraft. One should remember, however, that these are all relative to a particular route system, city-pairs served, operational environment, and needs of a commuter airline. As in almost any decision involving product evaluation, trade-offs are necessary in the selection of any particular aircraft.

In the South Dakota market, depending on the service points, the three most likely aircraft to use would be the Turbo Navajo, Beech 99, or Twin Otter. They offer reasonable passenger capacity, speed, and operating cost. The Nord 262 and SD3-30 are primarily for high density, short-haul route systems. They would perhaps be usable on routes between Sioux Falls, Pierre, and Rapid

TABLE 10  
ESTIMATED HOURLY OPERATING COSTS--SELECTED AIRCRAFT

Aircraft	Manufacturer	Approximate Equipped Cost	Direct Hourly Operating Cost	Indirect Hourly Operating Cost <sup>a</sup>
Turbo Navajo	Piper	\$ 183,000-- Non Pressurized \$ 325,000-- Pressurized <sup>c</sup>	\$108.00 <sup>b</sup>	\$ 72.00
Beech 99 <sup>d</sup>	Beechcraft	\$ 690,000	\$168.67	\$112.45
Twin Otter <sup>d</sup>	DeHavilland of Canada	\$ 655,000	\$164.46	\$109.64
Nord 262 <sup>4</sup>	Aerospatiale	\$1,100,000	\$289.62	\$193.08
SD3-30 <sup>c</sup>	Shorts	\$1,250,000	\$120.00	80.00

<sup>a</sup>Indirect Operating Costs were computed by assuming that direct operating costs comprise 60 percent of total hourly operating expenses.

<sup>b</sup>HNB Consulting Engineers, A Study of the Economic Feasibility of Providing Third Level Air Carrier Service in Wyoming (Cheyenne: HNB Consulting Engineers, December 1974), p. VIII-2.

<sup>c</sup>Manufacturers data in 1974 dollars.

<sup>d</sup>Data supplied by Allegheny Airlines in 1975 dollars.



TABLE 11  
 SELECTED AIRCRAFT PERFORMANCE DATA

Aircraft	Maximum Take-off Gross Weight--lbs.	Maximum Range With IFR Fuel Reserves <sup>a</sup> --Statute Miles	Maximum Cruise Speed-- Knots	Maximum Passenger Seating Capacity
Turbo Navajo	7,000	1,015	236	8
Beech 99	10,900	932	247	15
Twin Otter	12,500	795	182	20
Nord 262	27,700	713	220	29
SD3-30	22,000	400	198	30

NOTE: All data was either taken from the various manufacturers publications or computed from charts and graphs assuming maximum seating capacity. The data are estimates of average performance characteristics.

<sup>a</sup>IFR fuel reserves refer to the amount of fuel carried by an aircraft which will allow it to fly to its' intended destination, thence to its' planned alternate destination, and thence to continue to remain airborne for another forty-five minutes.

City. However, it is unlikely that these routes would be abandoned by the certified carriers.

The selection of one of the listed aircraft as the best for a South Dakota system would require much greater effort and research. The Wyoming Study (see Chapter III, page 50) found that on routes with low passenger volume the Navajo B would prove profitable, while on higher volume routes, the Twin Otter displayed profitability. Both intrastate and interstate routes were examined.

The reader may recall that Midwest Airlines operates Beech 99's on its routes in Kansas and Colorado. Allegheny Commuters use Beech 99's and Twin Otters.

Merely as a matter of comparison, table 12 lists the operating costs for aircraft currently serving the state. These aircraft are flown by both the trunkline and local carriers to service points in South Dakota.

In order to more clearly evaluate the use of large (greater than thirty passenger capacity) versus small (less than thirty passenger capacity) aircraft in the short-haul, low-density, South Dakota market, an analysis of the aircraft is required. As a means of comparing different aircraft for short-haul routes,<sup>1</sup> they are evaluated over varying stage lengths using the criteria of speed, costs (operating and subsidy costs), and fuel usage. Fuel usage is considered to be an important criterion because of the effect it has on costs and its potential shortage in future years. This relative scarcity and/or high cost could become one of the prime criteria in evaluating what transportation vehicles are used on different routes in the near future. Speed and frequency of service are essential criteria in evaluating any expedient mode of personnel transportation.

Table 13 illustrates time required, operating and subsidy costs, and fuel used for selected aircraft on various stage lengths.

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<sup>1</sup>Short-haul routes for this example will include trips up to two hundred miles in length.

TABLE 12

## SELECTED AIR CARRIER AIRCRAFT SERVING SOUTH DAKOTA HOURLY OPERATING COSTS--IN DOLLARS

	Aircraft Direct Operating Costs				Aircraft Indirect Operating Costs <sup>a</sup>			
	DC-9	FH-227	CV-580	B-737	DC-9	FH-227	CV-580	B733
North Central Airlines <sup>b</sup>	899.00		458.00		599.33		305.33	
Ozark Airlines <sup>c</sup>	639.00				703.00			
Western Airlines <sup>d</sup>				754.31				502.80

<sup>a</sup>Indirect operating costs with the exception of figures for Ozark Airlines, were computed by assuming that direct operating expenses comprised 60 percent of total operating expenses. Ozark supplied both direct and indirect costs.

<sup>b</sup>Interview with Jon Harty and David E. Moran, North Central Airlines, Inc., Minneapolis, Minnesota, 5 September 1975. System-wide Costs.

<sup>c</sup>Tom Preris, Ozark Airlines, letter. Figures are combined for both aircraft. System-wide costs.

<sup>d</sup>"Jet Operating Data, B-747, B-737," Air Transport World, September, 1975, p. 30. System-wide costs.

TABLE 13

## PERFORMANCE AND ESTIMATED COST DATA--SELECTED AIRCRAFT

Aircraft/ Distance (Statute Miles)	Cruise Altitude <sup>a</sup> Flying Time (Hours)	Operating <sup>b</sup> Costs (Dollars)	Subsidy <sup>c</sup> Costs (Dollars)	Fuel Consumed (Pounds)
Twin Otter <sup>d</sup>				
50	.3	82	62	200
100	.6	164	125	390
150	.9	247	187	550
200	1.1	302	229	680
Beech 99 <sup>e</sup>				
50	.3	84	64	170
100	.5	141	107	290
150	.7	197	150	390
200	.9	253	192	510
CV-580 <sup>e</sup>				
50	.3	229	174	770
100	.5	382	290	1250
150	.7	534	406	1870
200	.9	687	522	2400
DC-9 <sup>e</sup>				
50	.4	599	455	2190
100	.5	749	569	3030
150	.6	899	683	3850
200	.7	1049	797	4690

<sup>a</sup>Cruise altitudes were selected as average optimum altitudes used for various distances.

<sup>b</sup>Operating costs include both direct and indirect costs.

<sup>c</sup>Subsidy costs were estimated by taking 100 percent of direct and 40 percent of indirect operating costs.

<sup>d</sup>Flying time and fuel consumed were estimated from charts and graphs supplied by aircraft manufacturers. Costs were estimated using data supplied by Allegheny Airlines.

<sup>e</sup>Performance data and costs were estimated using information supplied by North Central Airlines.

In terms of costs and fuel required, the smaller aircraft are more economical. The larger aircraft aren't able to capitalize on their speed advantage in the fifty and one hundred mile stage lengths. The DC-9 experienced a more decided advantage, as would be expected, at the over one hundred-fifty and two hundred mile distances while the CV-580 is only slightly better than the Twin Otter and on par with the Beech 99. Of course, the applicability and profitability of any of the aircraft would depend upon the number of passengers carried.

A more explicit view of these aircraft is available when one uses them to evaluate a particular, hypothetical route in South Dakota. For this analysis, a route connecting Aberdeen to Sioux Falls with stops in Watertown and Brookings is used. A minimum of two flights per day is considered to be required for adequate service. The route is 168 statute miles in length and is depicted in figure 4.

Projected demand for the service was estimated using data generated by North Central Airlines. The data in table 14 display southbound traffic from Aberdeen, Watertown, and Brookings for 1974.

Table 15 depicts the aircraft used in this analysis. Data presented include estimates of time enroute, fuel consumed, and operating and subsidy costs for the various legs of the route.

Only three of the four aircraft being evaluated are capable of transporting thirty-seven passengers per day with two flights per day--the DC-9, CV-580, and Twin Otter. The Beech 99, with a

TABLE 14

NORTH CENTRAL AIRLINES SOUTH BOUND  
BOARDED PASSENGERS--1974

City	Yearly	Per-Day
Aberdeen	8,353	23
Watertown	4,032	11
Brookings	1,145	3
TOTAL	13,530	37

SOURCE: B. J. Campbell, North Central Airlines Enplaned Passengers--1974 (Minneapolis: North Central Airlines, May 10, 1976).

passenger capacity of fifteen would require at least three flight per day to serve the demonstrated demand for air transportation.

Of the three aircraft that could be used on a route with two flights per day, the DC-9 is the fastest and most expensive while the Twin Otter is slower and less expensive. For example the DC-9 requires thirty-six minutes to complete the route, consumes 6,100 pounds of fuel, and costs \$1,584 to operate and subsidize. Contrast this to the Twin Otter which requires more time, fifty-eight minutes, but consumes only 710 pounds of fuel and costs \$466 to operate and subsidize. The CV-580, resting in between the previously discussed aircraft, requires forty-four minutes to fly the route while consuming 2,300 pounds of fuel and costing \$985 to

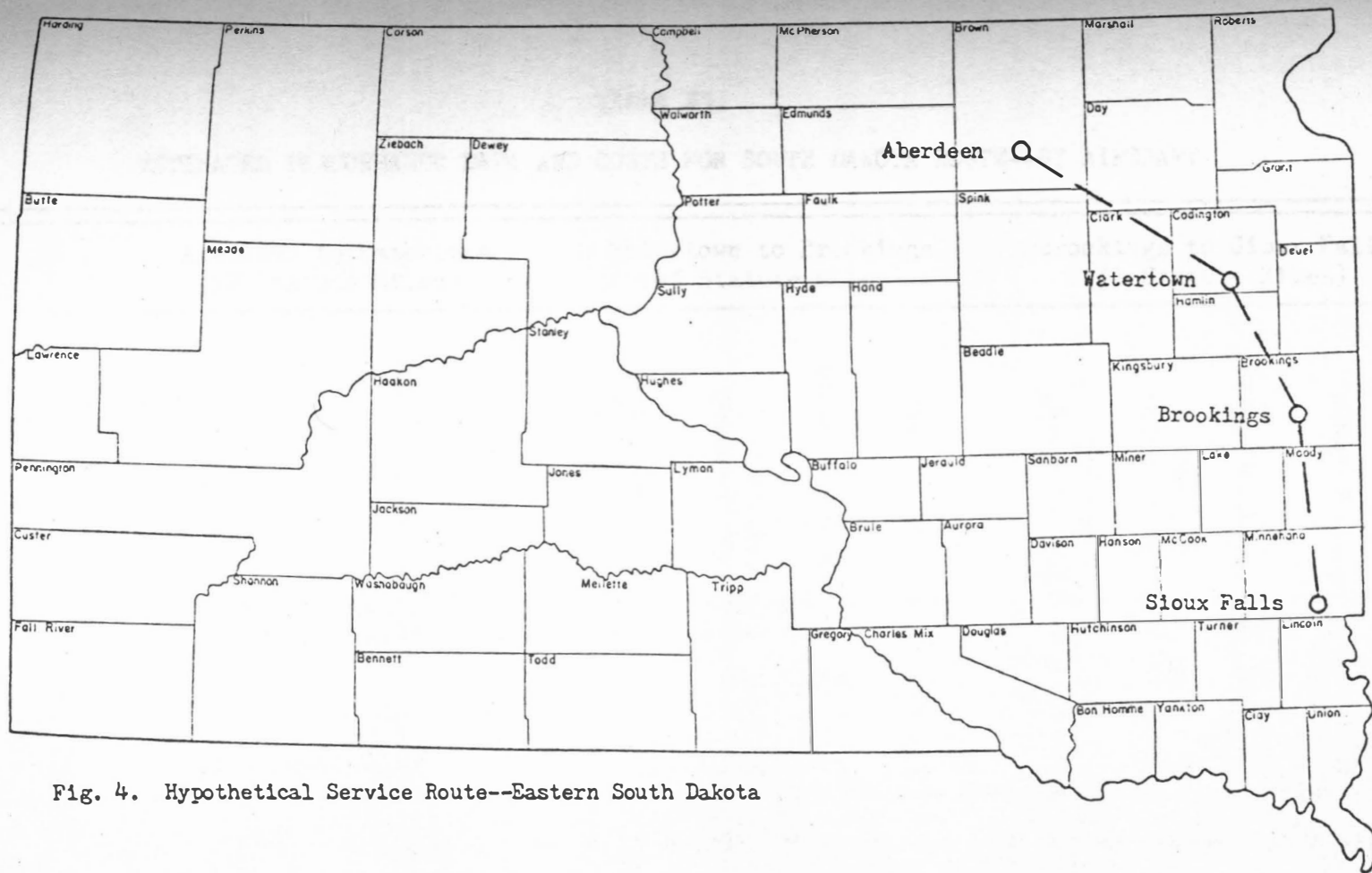


Fig. 4. Hypothetical Service Route--Eastern South Dakota

TABLE 15

## ESTIMATED PERFORMANCE DATA AND COSTS FOR SOUTH DAKOTA ROUTE--BY AIRCRAFT

Aircraft	Aberdeen to Watertown (72 Statute Miles)				Watertown to Brookings (45 Statute Miles)				Brookings to Sioux Falls (51 Statute Miles)			
	Time Enroute <sup>a</sup> (Minutes)	Fuel Consumed (Pounds)	Operating Costs	Subsidy Costs	Time Enroute <sup>a</sup> (Minutes)	Fuel Consumed (Pounds)	Operating Costs	Subsidy Costs	Time Enroute <sup>a</sup> (Minutes)	Fuel Consumed (Pounds)	Operating Costs	Subsidy Costs
DC-9 <sup>b</sup>	16	2300	\$400	\$304	10	1900	\$250	\$190	10	1900	\$250	\$190
CV-580 <sup>b</sup>	18	900	229	174	12	700	153	116	14	700	178	135
Twin Otter <sup>c</sup>	24	300	110	83	16	190	73	56	18	220	82	62
Beech 99 <sup>c</sup>	22	210	102	78	15	180	70	53	17	200	79	61

<sup>a</sup>Time enroute does not include taxi time because taxi time will be nearly the same for all aircraft.

<sup>b</sup>All cost and performance data was computed from data supplied by North Central Airlines and is for the year 1975.

<sup>c</sup>Cost data was computed from data supplied by Allegheny Airlines. Performance data was computed from manufacturers data.



operate and subsidize. The DC-9 consumes 8.6 times more fuel and costs 3.4 times as much to operate as the Twin Otter on this route. The Twin Otter could offer the option of greater than two more flights per day on the route and still cost less to operate and consume less fuel than the DC-9.

The Beech 99 would also be able to offer greater frequencies while maintaining a better cost and fuel consumption schedule than the DC-9. For example, over three route trips could be completed by the Beech 99 for the same cost of one DC-9 trip. In addition, the Beech 99 would consume 1,710 pounds of fuel in three trips while the DC-9 consumes 6,100 pounds in one trip.

On the basis of operating costs only, assuming two flights per day transporting thirty-seven passengers, the per passenger costs for the various aircraft would be:<sup>1</sup> \$85.62 for the DC-9; \$53.24 for the CV-580; and \$25.18 for the Twin Otter. If a flight frequency of four trips per day were used to transport the same number of passengers, the respective costs per passenger would be:<sup>2</sup> \$171.24 for the DC-9; \$106.48 for the CV-580; \$50.36 for the Twin Otter; and \$47.89 for the Beech 99. The comparisons point out that better service, in terms of frequency of flights, is available at

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<sup>1</sup>Per passenger costs were obtained by multiplying the cost (operating and subsidy) for the route by two (the number of flights) and dividing by thirty-seven.

<sup>2</sup>Per passenger costs were obtained by multiplying the cost (operating and subsidy) for the route by four (the number of flights) and dividing by thirty-seven.

less cost when using the smaller aircraft on the short-haul, low-density market. This is the type of market a commuter would serve in South Dakota.

If demand for air transportation were to increase, how would the various aircraft be able to adjust to this increased demand and how many flights would be required to serve this demand? Assuming increases in demand from 10 to 100 percent in increments of 10 percent, the costs per passenger and the number of flights required, with two flights per day the minimum flight frequency allowable, are presented in table 16. It is interesting to note that the smaller aircraft (Twin Otter and Beech 99) can adjust to the increased demand by increasing service and still operate more economically than the DC-9. The Twin Otter also operates at a smaller cost than the CV-580, but the Beech 99, cannot compete after fifty-nine passengers because of the need for five flights to accommodate the passenger load. However, if a third flight were added to the CV-580 schedule, the Beech 99 would be more economical, even if another flight (six flights) were added to its schedule.<sup>2</sup> The DC-9 would require 121 passengers, with a flight

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<sup>1</sup>With a flight frequency of three, the per passenger costs for the CV-580, with seventy-four passengers would be \$49.93 while the Beech 99 with a flight frequency of six, carrying seventy-four passengers, would have a per passenger cost of \$35.92.

<sup>2</sup>The per passenger costs for the DC-9 and Twin Otter are \$26.18 and \$26.96, respectively with 121 passengers. The Twin Otter, however, provide a flight frequency of seven.

TABLE 16

ESTIMATES OF INCREASED DEMAND AND  
PROJECTED PER PASSENGER COSTS

Aircraft	Passengers <sup>a</sup>	Flights Required <sup>b</sup>	Dollars Cost Per Passenger <sup>c</sup>
DC-9	41	2	77.27
	44	2	72.00
	48	2	66.00
	52	2	60.92
	56	2	56.57
	59	2	53.69
	63	2	50.29
	67	2	47.28
	70	2	45.25
74	2	42.81	
CV-580	41	2	48.04
	44	2	44.77
	48	2	41.04
	52	2	37.88
	56	2	35.18
	59	2	33.40
	63	2	31.27
	67	2	29.40
	70	2	28.14
74	2	26.62	
Twin Otter	41	3	34.10
	44	3	31.77
	48	3	29.13
	52	3	26.88
	56	3	24.96
	59	3	23.69
	63	4	29.59
	67	4	27.82
	70	4	26.63
74	4	25.19	
Beech 99	41	3	32.41
	44	3	30.20

TABLE 16--Continued

Aircraft	Passengers <sup>a</sup>	Flights Required <sup>b</sup>	Dollars Cost Per Passenger <sup>c</sup>
Beech 99	48	4	36.92
	52	4	34.08
	56	4	31.64
	59	4	30.03
	63	5	35.16
	67	5	33.06
	70	5	31.64
	74	5	29.93

<sup>a</sup>The number of passengers represent increases in demand in increments of 10 percent over the original demand displayed in table 14.

<sup>b</sup>Flights required were dictated by the seating capacity of the aircraft. Two flights per day is assumed to be the minimum acceptable frequency level.

<sup>c</sup>Cost per passenger was estimated by multiplying the cost (operating and subsidy) for the route for each aircraft by the number of flights and dividing by the number of passengers.

frequency of two, in order to be competitive, cost-wise, with the Twin Otter and 105<sup>1</sup> passengers to become more economical than the Beech 99. In order for this to occur, demand would have to increase nearly 200 percent--this is assuming a constant flight frequency of two. It is highly unlikely, given past levels of demonstrated demand for the low frequency service used on this route, that an increase in demand of this magnitude will be forthcoming in the near future.

<sup>1</sup>The per passenger costs for the DC-9 and Beech 99 are \$30.20 and \$30.17 respectively with 105 passengers. The Beech 99 would, however, provide a flight frequency of seven.

The reader will recall that in the short-haul markets, consumers view frequency of service as an important factor in choosing air transportation over other modes. Both of the smaller aircraft would offer this desired flexibility while displaying greater economy than both the CV-580 and the DC-9.

### Impacts

Many groups of people and geographical areas would be affected by a commuter airline system. Changes occurring as the result of commuter service would alter the economic well being of many individuals and business entities. Figure 5 displays potentially affected groups and possible impacts.

The general impact of a commuter system would be in the potential it has to stimulate travel and thus open up the area for economic activity. Readily accessible, dependable transportation is one of the necessary ingredients for economic expansion.

Of all the groups affected by a commuter system, the FBO's (Fixed Base Operators) would probably be hurt, at least in the short run--one to five years. However, as the area developed, these businesses might receive increased levels of business from new sources not previously in the area, i.e. new business and individuals. As the matrix (figure 5) points out, a greater acceptance and use of non-scheduled air taxi service would most likely spill over into the private aviation entrepreneurs' business.

Cities and towns as well as the region served by the commuter would possibly experience a surge in general economic activity which

FIGURE 5

## POSSIBLE IMPACTS BY GROUP--SOUTH DAKOTA COMMUTER AIRLINE SYSTEM

Impact	Monetary	
	Transportation and Travel	Economic Development
Commuter Systems Cities	Increased use of facilities supporting air travel would increase maintenance costs but also provide new sources of revenue.	Increased business, commercial, and housing activity would place greater demand on city services but also provide increased tax and business revenues.
FBO's	Possible decrease in air taxi revenue as consumers use the commuter system--short run effects.	New customers for air taxi, flight instruction, and other services may develop as the economic activity of the city and area increases thus improving long run earnings
Industry and Business	Greater flexibility for businesses in meeting business commitments which would allow for savings in time and thus traveling expenses.	Provide better access to cities for new or expanding businesses which would increase the tax base, and provide more jobs.
Private Consumers	The use of air transportation for personal travel may increase and increased personal travel would result in increased spending for travel related services.	More opportunities for employment would be available as economic activity intensified. Increased employment opportunities would increase personal disposable income.

FIGURE 5--Continued

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 Nonmonetary
 

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 Transportation and Travel
 

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 Economic Development
 

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Makes the city more accessible and improves the overall transportation system.

Improves the city's economic potential by making the city more appealing to expanding business and commercial entities.

Increase the desirability and use of air travel as a primary mode of transportation.

Improve the prospects for expansion and growth of individual operators in the long run.

Increased productivity of personnel would be possible if they could travel more freely on an air system that provided frequent arrivals and departures.

Give businesses more alternatives in selecting sites for expansion thus enhancing their ability to choose a site that will maximize their expansion, growth, and earnings.

Provide more options in choosing transportation modes.

Enhance personal mobility thus allowing individual entrepreneurs access to larger trade areas.

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FIGURE 5--Continued

Impact	Monetary	
	Transportation and Travel	Economic Development
Local and Trunkline Air Carriers	Link passengers to longer route systems operated by local trunkline carriers thus increasing the potential earnings of these carriers.	Increased traffic to and from the area will provide more demand for flights connecting to commuter systems with resultant increases in revenue.
Commuter System Region	Provide the region with better air transportation thus enhancing spending in travel, tourist, and related industries.	Promote region-wide economic growth with the resultant multiplier effect as money is injected into the regional economy.



FIGURE 5--Continued

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Nonmonetary	
Transportation and Travel	Economic Development
Increase the acceptance and use of air transportation thus perpetuating the air transportation industry.	Create the need for personnel in the airline and associated businesses thus promoting the growth of the airline industry.
Improve overall regional transportation by offering more air travel in addition to the present modes of personal transportation.	Encourage interest in the area by outside economic groups.

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would ripple through the entire local and regional economy. Admittedly, the cities would be required to provide expanding services and facilities to accommodate growth, but the benefits of expansion would probably offset the costs--provided they were planned for properly.

#### Summary

The estimated costs associated with airline operations were used to compare the cost characteristics of various aircraft. Short-haul markets with routes that serve low-density service points require aircraft uniquely fitted for this market. Because of their higher operating costs, large aircraft are neither economically suited, nor are they required for these markets. Their excess capacity is often times wasted and because of their low-frequency they provide minimal service.

Individuals interested in development of a South Dakota commuter system should thoroughly analyze the prospective demand for the short-haul market. The service should be designed primarily to attract and serve the business traveler. In addition, costs should be carefully studied to determine the optimum aircraft for the system. Thorough route analysis, with emphasis on optimum aircraft usage would enable cost control and increased utilization.

In general terms, it would be expected that a commuter system would enhance the economic well being of impacted cities, businesses, and individuals. Some negative impacts may occur to

FBO's in the short run. However, as the region developed, they, too, would probably gain, indirectly, from a commuter system.

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## CHAPTER VI

### SOUTH DAKOTA AIR TRANSPORTATION

#### SYSTEM AND FACILITIES

The State of South Dakota currently has an air transportation system consisting of FBO's and certified air carriers. This system, along with the airport and radio air navigation system established in the state is the topic of this chapter. This discussion outlines the current air transportation system and its volume of traffic, airports usable as commuter service points as well as those requiring improvements, and the criteria for upgrading a facility for commuter use.

#### Air Transportation System

South Dakota is currently served by four air carriers: three locals and one trunkline. These carriers provide service to nine cities. Tables 8 and 9 in Chapter IV display the number of boardings and scheduled departures for various points from 1962 to 1974. Table 17 lists in more detail the number of inbound and outbound passengers for various points in the state in 1973 and 1974.

The tables show that air travel has increased in the state. Boardings have increased steadily while departures (frequencies) have decreased. More recent data display a greater usage of

TABLE 17

## SOUTH DAKOTA AIRLINE PASSENGER SUMMARY--1973-74

Airport	1973 Outbound	Per- Cent	1973 Inbound	Per- Cent	1974 Outbound	Per- Cent	1974 Inbound	Per- Cent	Percent Change Outbound	Percent Change Inbound
Aberdeen <sup>a</sup>	23,671	6.2	22,188	5.9	29,634	7.1	28,240	6.8	+25.0	+27.3
Brookings	2,188	0.6	2,029	0.5	2,576	0.6	2,501	0.6	+18.0	+23.3
Huron <sup>a</sup>	4,081	1.0	3,949	1.0	5,937	1.4	5,664	1.4	+45.0	+43.4
Mitchell	3,372	0.9	3,395	0.9	3,359	0.8	3,177	0.8	- 0.4	- 6.4
Pierre	31,292	8.2	31,560	8.4	35,948	8.6	34,385	8.3	+15.0	+ 9.0
Rapid City	115,321	30.4	115,463	30.6	119,539	28.7	119,648	28.9	+ 4.0	+ 3.6
Sioux Falls	184,182	48.5	184,199	48.9	202,015	48.5	204,678	49.4	+10.0	+11.1
Watertown	11,333	3.0	10,567	2.8	12,417	3.0	11,513	2.8	+10.0	+ 9.0
Yankton	4,078	1.1	3,629	1.0	5,133	1.2	4,489	1.0	+26.0	+23.7
TOTAL	379,518		376,979		416,588		414,295		+ 9.8	+ 9.9

SOURCE: Monte R. Schneider, Director of Aeronautics, South Dakota Department of Transportation, to Tom Hraby, Brookings, 27 February 1975. South Dakota Air Transportation.

NOTE: Average Passenger Traffic Per Month:

	<u>1973</u>	<u>1974</u>
Peak Month - August	Outbound - 31,626	Outbound - 34,731
Low Month - February	Inbound - 31,415	Inbound - 34,524
Peak Quarter - July, August, September		
Low Quarter - January, February, March		

Percent columns do not add up to 100 due to rounding.

<sup>a</sup>Airports closed for construction:

Aberdeen - Parts of July and August 1973; 8 days in July 1974

Huron - July 23 to September 5, 1973; May 20 to June 17, 1974.

outbound rather than inbound air transportation. More consumers are using fewer flights, in most locations, to travel both intra-state and interstate routes.

The amount of traffic carried by each carrier is illustrated in table 18. Western, with only three service points in the state, leads all carriers in the number of passengers carried.

Another measure of the increased demand for air transportation in South Dakota is the amount of freight, express, and mail flown from South Dakota cities. Each of these has increased steadily from 1962 through 1974. In a broad sense, these increases could be used as a barometer of business activity and expansion. These data are presented in table 19.

Finally, table 20 displays the number of departures and arrivals at the air carrier cities--a measure of the level of service. Brookings, Mitchell, Huron, and Yankton all have four or fewer departures per day.

The data presented in the preceding tables allow an evaluation of the scheduled air transportation system in South Dakota. The overall picture displays increases in passenger volume and non-passenger business. Among towns served by scheduled carriers, Brookings, Huron, Mitchell, and Yankton provide only about 4.0 percent of all outbound passengers and 3.8 percent of all inbound passengers. These points are also the most poorly served in terms of frequency of service. If, as was suggested in other studies (see Chapter IV), the correlation between frequency of service and

TABLE 18

## INDIVIDUAL AIR CARRIER PASSENGER SUMMARY--SOUTH DAKOTA, 1974

Airport	Airlines <sup>a</sup>	Outbound		Inbound	
		Thousands Persons	Percent Total	Thousands Persons	Percent Total
Aberdeen <sup>b</sup>	NOR	29.6	7.1	28.2	6.8
Brookings	NOR	2.6	0.6	2.5	0.6
Huron <sup>b</sup>	NOR	5.9	1.4	5.7	1.4
Mitchell	NOR	3.4	0.8	3.2	0.8
Pierre	NOR	7.7	1.9	10.0	2.4
	WAL	28.2	6.8	24.4	5.9
Rapid City	NOR	15.4	3.7	17.8	4.3
	WAL	62.8	15.0	57.3	13.8
	FAL	41.4	9.9	44.5	10.7
Sioux Falls	NOR	55.5	13.3	51.6	12.4
	WAL	102.8	24.7	106.2	25.6
	OZK	43.7	10.5	46.9	11.3
Watertown	NOR	12.4	3.0	11.5	2.8
Yankton	NOR	5.1	1.3	4.5	1.2
TOTALS:	NOR	137.6	33.0	135.0	32.6
	WAL	193.6	46.5	187.9	45.3
	FAL	41.4	10.0	44.5	10.8
	OZK	43.7	10.5	46.9	11.3
		416.6	100.0	414.2	100.0

SOURCE: Monte R. Schneider, Director of Aeronautics, South Dakota Department of Transportation, to Tom Hruby, Brookings, 27 February 1975. South Dakota Air Transportation.

<sup>a</sup>NOR - North Central Airlines  
WAL - Western Airlines  
FAL - Frontier Airlines  
OZK - Ozark Airlines

<sup>b</sup>Airport closed for construction:  
Aberdeen - Closed 8 days in July  
Huron - Closed May 20 to June 17.

TABLE 19

## FREIGHT, EXPRESS AND MAIL ORIGINATIONS--SOUTH DAKOTA, 1962-1974

Year	Freight		Scheduled Service Express		Total U.S. & Foreign Mail	
	Tons	Percent Change	Tons	Percent Change	Tons	Percent Change
1962	134.4		121.7		235.9	
1965	229.7	+ 71	146	+20	262.9	+ 11
1970	677.4	+195	277	+90	1248.9	+375
1974 <sup>a</sup>	1645.4	+143.1	261.7	- 6	1327.8	+ 6

SOURCE: U.S. Department of Transportation, Civil Aeronautics Board, Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended June 30, 1962 (Washington, D.C.: U.S. Government Printing Office, 1962), pp. 172-73; U.S. Department of Transportation, Civil Aeronautics Board, Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended December 31, 1965 (Washington, D.C.: U.S. Government Printing Office, 1966), p. 144; U.S. Department of Transportation, Civil Aeronautics Board, Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended June 30, 1970 (Washington, D.C.: U.S. Government Printing Office, 1970), p. 143; and U.S. Department of Transportation, Civil Aeronautics Board, Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended June 30, 1974 (Washington, D.C.: U.S. Government Printing Office, 1974), p. 98.

<sup>a</sup>Figures for 1974 are in Enplaned revenue tons--the number of revenue tons of freight, express, U.S. and foreign mail loaded on an aircraft including originating and transfer tons.



TABLE 20

SOUTH DAKOTA SCHEDULED AIR  
TRANSPORTATION, DAILY  
BASIS--OCTOBER, 1975

Cities	Arrivals	Departures
Aberdeen	8	8
Brookings	4	4
Huron	3	3
Mitchell	4	4
Pierre	8	8
Rapid City	10	10
Sioux Falls	35	35
Watertown	8	8
Yankton	4	4

demand for short-haul air transportation is positive, the low passenger volume in these towns may be explained. One can expect these points to continue this performance if current frequency levels continue.<sup>1</sup>

In addition to the scheduled air carriers, another form of air transportation is available in South Dakota--non-scheduled air taxi. Fixed base operators offer air taxi service as an

<sup>1</sup>The current passenger volume is low at these points, but it has increased over the years (see table 9, page 70). As was emphasized earlier, this is contrary to what one would normally expect.

alternative and supplement to scheduled air transportation. Table 21 lists the number and operating bases of Air Taxi operators in the state.

TABLE 21

## AIR TAXI OPERATORS--SOUTH DAKOTA, 1975

Air Carrier Cities <sup>a</sup>		Other Cities	
Airports	Number	Airports	Number
Aberdeen	2	Britton	1
Brookings	1	Lemmon	1
Huron	2	Milbank	1
Mitchell	1	Mobridge	1
Pierre	2	Spearfish	1
Rapid City	5	Sturgis	1
Sioux Falls	3	Vermillion	1
Watertown	1	Winner	1
Yankton	1		

SOURCE: Federal Aviation Administration, General Aviation District Office, Rapid City, South Dakota, to Tom Hraby, Brookings, 18 August 1975. South Dakota Air Taxi Operators--1975.

<sup>a</sup>Air Carrier Cities refers to those cities receiving scheduled certified airline service.

These operators fly a variety of equipment, from small single-engine aircraft, to larger twin-engine airplanes capable of carrying over ten passengers. The costs for their services vary with the type and size of aircraft and nature of the flight.

### Airport and Radio Navigation Facilities

In order to have an operable commuter system, certain facilities are required. Service points must have a minimum level of quality in terms of the physical makeup of the airport and its supporting equipment. Accordingly, criteria have been designed by the author to provide a level of measurement for facilities at a commuter service point. They are:

1. Runway - The runway should be paved and of sufficient strength and length to accommodate the take-off and landing requirements of applicable FAR's for commuter operation.
  
2. Approach Aids - Electronic: An IFR capability is mandatory. At least a 90-95 percent completion factor, considering meteorological conditions, is desired. A VOR would be desirable but a non-directional-beacon would be acceptable.  
  
Lighting: A rotating beacon, medium intensity runway lighting, and obstruction lights are required. Runway-end-identification-lights are desirable.
  
3. Personnel - Trained weather observers providing on-site observation of weather phenomena and equipment are required. These individuals might be commuter airline employees, thus eliminating duplicity of personnel.
  
4. Terminal - Terminal facilities should be designed to meet the requirements of the expected demand. Minimum facilities would include a waiting area with chairs, ticket counter, restrooms, public telephone, heat, lights, and a storage area.  
  
A paved ramp with paved walkways to the terminal area as well as security fencing are required.
  
5. Services - Maintenance capabilities which include refueling and minor repairs are desirable but not mandatory.

## Airports

Using the criteria as a guide, we can evaluate South Dakota's system of airports. There are only nine cities that would currently meet all the requirements of the criteria, i.e. the nine air carrier cities.

A complete listing of airport facilities for the various airports in South Dakota is available by referring to appendixes 2 and 3. The appendixes list the facilities at the current air carrier cities and selected future possible commuter service points.

## Navigational Aids

In addition to the system of airports, the State also has a system of radio navigation aids which are used as enroute<sup>1</sup> as well as terminal<sup>2</sup> facilities. Figure 6 depicts these facilities and their locations.

## Airport Improvements

The nine air carrier cities are the only localities that could serve currently as commuter service points under the criteria listed in appendix 4. Other sites would require upgrading programs of varying degrees. The facility requirements, available funding, and needs assessment would dictate which points could be used.

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<sup>1</sup>Enroute navigation aids provide course and position information for cross-country flights.

<sup>2</sup>Terminal navigation aids are used to provide course, position, and glide path information for instrument approaches for landing. They could be used for instrument departures.

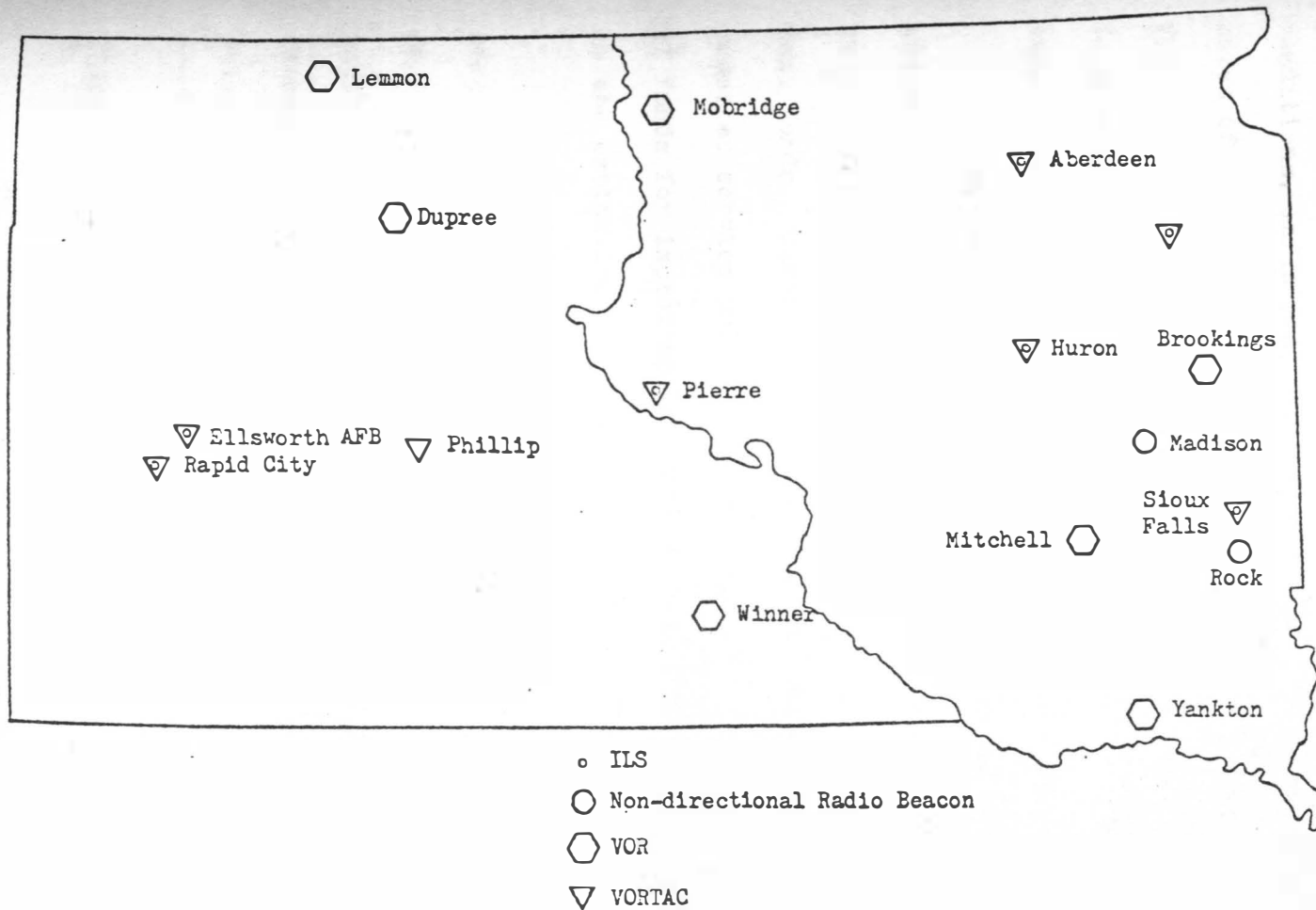


Fig. 6. Location of South Dakota Radio Navigational Aids--1975

The costs for improvements would vary depending on local conditions, inflation, and other factors. In order to give estimates of the costs for various items, cost estimates used in the Wyoming study<sup>1</sup> will be multiplied by an inflation factor of 1.2 to give average cost estimates in 1975 dollars.<sup>2</sup> Table 22 displays these estimates.

The costs required to upgrade a currently unacceptable airport for commuter service could be very high. Runway paving and radio and lighting aids would require the largest outlay of investment funds. Careful evaluation of a particular airport as a commuter service point should be conducted prior to the commitment of funds for improvements. Special consideration should be given to the estimation of costs and potential benefits.

In addition to a radio navigation facility for IFR (Instrument Flight Rules) flights, direct voice communications with ATC (Air Traffic Control) would be required. Regular air to ground radio transmissions to ATC facilities or telephone land line communications which would have transmission and receiving capabilities through a local radio navigation aid could be used. Oftentimes

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<sup>1</sup>HNB Consulting Engineers, A Study of the Economic Feasibility of Providing Third Level Air Carrier Service in Wyoming, p. IX-10.

<sup>2</sup>Due to the date of the study used, a factor of 1.2 realistically represents estimated costs for construction in 1975-76. Cost indexes for the construction of commercial buildings, highways, and general construction displayed an increase at the average yearly rate of 8.7 percent, 13.2 percent, and 9.9 percent, respectively for the time period 1970-74. "Price and Cost Indexes for Construction and Selected Components of Construction: 1950-1974," The U.S. Fact Book, (New York: Grosset and Dunlap, 1975), p. 708.

TABLE 22

## ESTIMATED COSTS FOR AIRPORT IMPROVEMENTS--1975 DOLLARS

Item	Estimated Costs
VOR <sup>a</sup>	\$54,000
VASI-2 <sup>b</sup>	\$30,000
Runway (Paving)	\$6.60/sq. yd.
Runway (Overlay)	\$3.60/sq. yd.
MIRL <sup>c</sup>	\$7.20/lineal ft.
Runway Markings	\$6,600/runway
Terminal Building	\$46.00/sq. ft.
Rotating Beacon	10" \$3,000 36" \$8,400
Apron Paving	\$6.00/sq. yd.

<sup>a</sup>VOR refers to Very High Frequency Omnidirectional Range--a radio navigation facility.

<sup>b</sup>VASI-2 refers to Visual Approach Slope Indicator. It is a visual reference consisting of two sets of parallel lights which give an indication of the proper glide slope for landing.

<sup>c</sup>MIRL refers to Medium Intensity Runway Lights.

air to ground radio transmissions to existing FAA sites from these more remote airports is impossible at low altitude because of the "line-of-sight" characteristics of UHF and VHF radio transmissions. This factor is the reason for VFR (Visual Flight Rules) only use of the VOR's (VHF Omnidirectional Station) at Lemmon and Mobridge. If land lines were required, they would add an additional expense to the improvement costs.

### Summary

Over the last decade scheduled air transportation has decreased to all but two cities in South Dakota, i.e. Sioux Falls and Rapid City. At the same time, boardings have risen at all service points in the state, with the exception of Huron. Marginally served points--less than five departures daily--would provide the most logical commuter route stops. It is service to these areas that dictates consideration of commuter service.

Adequate airport facilities for commuter operations exist at only nine points in South Dakota--the nine air carrier cities. Other sites could be developed and used if improvements were completed. However, in general the necessary improvements would be costly.



## CHAPTER VII

### EVALUATION OF INTEREST IN A SOUTH

#### DAKOTA COMMUTER SYSTEM

The reactions and inputs from various groups potentially affected by a commuter system are important to this study. These groups' evaluations of commuter desirability and feasibility weigh heavily on the potential success of a commuter system.

Questionnaires were used to gain this information from air taxi operators and local civic and governmental units. They were used to gain opinions concerning the interest in, desirability and feasibility of, and the need for a commuter system in South Dakota.

The questionnaires were sent only to FBO's and selected organizations (Chambers of Commerce and airport boards) in the nine air carrier cities. These groups are considered to be the ones most interested in and most likely to be economically affected by a commuter system. This selection process is consistent with the purpose of evaluating a system which would provide service to some or all of the present air carrier cities. The responses and opinions of the potentially affected parties allowed for an evaluation of the plausibility of this transportation mode concept as it applied to South Dakota.

### FBO Questionnaire

Questionnaires were sent to fifteen FBO's in the nine air carrier cities. Twelve of the questionnaires were completed and returned. Appendix 4 shows the questionnaire used and a summary of the responses given to the various questions is contained in appendix 5.

Generally speaking, there would be no problem in securing adequate crew members for a commuter system. The FBO's indicated that an ample number of qualified pilots are either employed by them or could be easily obtained.

The supply of "desirable" multi-engine aircraft is questionable. The aircraft listed under question 6 of the questionnaire, with the exception of the Beechcraft 18's and 99's as well as the Cessna 401 and Piper Turbo Navajo, are not adequate, in the opinion of the author, for commuter operations. Their passenger carrying capacity is low--six passengers or less depending on fuel load. The aircraft could be used but their lack of passenger carrying capacity makes them marginal.

Existing maintenance capabilities vary, but in general they would be adequate for most aircraft in the Twin Otter class. Major airframe and powerplant maintenance capabilities exist at most FBO locations. However, engine overhaul for the turboprop engines would have to be done elsewhere unless someone established a sufficient maintenance facility.

Some investment in plant facilities, training, and tools would be required. The majority of responses preferred a centralized maintenance facility. This could help reduce duplicity of investment, allow for greater specialization in maintenance performed, and provide greater economies in terms of maintenance personnel. Phase maintenance--working on particular aircraft system components in sequence--would be required for those using the service. This would minimize down time and allow for greater aircraft utilization. Schedules could be devised to get the aircraft in and out with a minimum of delay.

Capitalization of a commuter operation appears feasible as 75 percent (nine respondents) of those who responded to question 11 answered affirmatively when asked about financing. Problems might arise if purchases of three to four of the desired aircraft are required by a single operator. The lines of credit or funds currently used by the FBO's would probably be adequate for financing an operation using two to four aircraft. However, if some form of subsidy were not available, the lines of credit must be sufficient to finance at least two to three years of operation at a deficit. The possibility of leasing is one alternative to buying that could also be explored.

Most operators expressed the opinion that a commuter system would have little affect on their present level of business. This indicates that these businessmen don't think they are really competing with scheduled air transportation as it now exists. Perhaps

a commuter system would provide more direct competition and thus erode the FBO's current business volume of passenger flights.

The questions used to evaluate the FBO's interest in a commuter operation as well as their views of its' prospects for success provided contrasting appraisals. Seven of the respondents expressed an interest in becoming involved in a commuter system. They gave a variety of comments to support their answers: 1) South Dakotans are becoming more aware of the advantages of air travel and the prospects look good for a profitable system; 2) Future development of their business has been contemplated along these lines--commuter service; 3) Any activity that would increase one's business would be of interest; and 4) Interested only if very careful examination and planning is done prior to becoming involved.

The negative respondents (four respondents) cited a variety of reasons for their answers. Basically, they expressed skepticism of the need for this type of service.

However, in answering question 17, which required their appraisal of the possible success of a commuter system, the respondents were less positive. Only two indicated affirmatively while five were unable to decide or simply didn't complete the question. The five negative responses gave the following reasons for their selection: 1) inadequate population; 2) high operating costs which would be prohibitive without subsidy; 3) no need for this type of service; and 4) general lack of support by cities and towns.

Affirmative responses alluded to the large amount of inter-city travel, especially to and from the state capitol. The effects of higher automotive traveling expenses and lower speed limits were also mentioned as factors that might contribute to commuter use.

Chambers of Commerce and City  
Government Questionnaire

Another questionnaire was sent to the Chambers of Commerce, and Airport Boards in the nine air carrier cities. Thirteen of the questionnaires were returned. The questionnaire and a summary of the responses are contained in appendixes 6 and 7, respectively. The questionnaire was designed to determine these groups' opinions concerning present air carrier service to their cities and their attitudes towards a commuter system which would replace or supplement the current service.

All respondents indicated that air transportation is a very important factor in their communities' economic growth and stability. Additional comments stated that the economic growth of the community is tied to adequate scheduled air service. Government, industry, and professional personnel (medical, legal, and educational), as well as the general public, were mentioned as primary users of this mode of transportation.

Respondents in most localities expressed satisfaction with the level of service they now receive. However, those who weren't satisfied most often mentioned the problem of poor interconnecting schedules at larger terminals, i.e., Sioux Falls, as well as

generally poor east-west service as reasons. Respondents in cities which connect with Sioux Falls for further travel were particularly opinionated in this complaint.

Responses to the prospect of commuter service and its relationship to the overall level of scheduled air service expressed controlled positivism. The respondents indicated an eagerness for the service if it supplemented the existing level of air service. They were very insistent in this respect and it leads one to conclude that they desire to retain what they now receive in terms of scheduled air service. Those who were more positive in their affirmations cited better service by aircraft suited to serve low-density service points as the reasons for their answer.

On the negative side, the concept of service degradation seemed to motivate these respondents. Evidently, they equated commuter service with a step down or a lowering of their air service and consequently they reacted negatively.

Evaluations of the possible economic effects of commuter services upon a community were generally positive. The service would, according to those who answered, enlarge trade areas, increase the volume of air travel, improve citizen mobility, and enhance the accessibility of the community to new business and industry. Contrasting these views, those who answered negatively stated that commuter service would downgrade their present service and thereby have undesirable effects on the local economy. In

addition, they said that, in some instances, a commuter simply wouldn't be able to handle the volume of traffic.

The respondents' evaluation of the use and acceptance of a commuter system by local citizens was divided--six affirmative and seven negative responses to questions 6, appendix 6. If frequency of service, good scheduling, and intensive public relations work were done to sell commuter service to the consumers, the affirmative respondents to question 6 indicated that the system would be accepted. Negative comments concentrated on an assumed lack of service by a commuter--unable to handle passenger demand--as well as intermediate stops as possible reasons for less than enthusiastic citizen usage.

The final question which queried the communities willingness to subsidize a commuter system, elicited a very negative attitude toward any involvement by the cities in a subsidy program. The respondents indicated that the Federal Government should continue, through the CAB, to administer any airline subsidy. Interestingly, none mentioned indirect forms of subsidy, i.e. free terminal space, no landing fees, etc., as a possibility. The attitude of "why pay for something that we now receive free," was evident in the attached comments.

In brief summary, the two questionnaires identify an apparent lack of interest in establishing a commuter system. Although respondents in some cities aren't satisfied with their current level of airline service, they didn't appear to desire a commuter system intensely enough to consider involvement in any form of

subsidization. Most expressed the sentiment that a commuter system would be acceptable only as a supplement, not as a replacement, to their present level of service. The attitude or idea that commuter service equates to a degradation of service seemed to motivate these statements of opinion concerning commuter desirability.

Although there appears to be sufficient personnel and available capital to generate FBO involvement in a commuter system, few operators indicated that a commuter system will work. Perhaps if there were routes available that wouldn't compete with local carriers and if there were subsidization, the outlook would be more optimistic.

#### North Central Airlines Interview

Feasibility of a commuter system is greatly affected by the adequacy of service provided by air carriers serving South Dakota's cities. If routes were abandoned and points dropped, perhaps then the desirability of commuter service would increase.

North Central Airlines is the only air carrier providing service to all air carrier cities in South Dakota. The other carriers serving the state were not judged, at this time, to have direct interest in a commuter system. Ozark and Frontier serve Sioux Falls and Rapid City, respectively, while Western serves Rapid City, Pierre, and Sioux Falls. They aren't involved in serving marginal, low-density points. North Central serves the low-density points in the eastern part of the state--Brookings, Huron, Mitchell, and Yankton. If these points were to be dropped



from North Central's route system, they would be logical selections for commuter service. In order to ascertain North Central's attitude toward continued service in South Dakota, the author conducted an interview with North Central executives.<sup>1</sup>

The interview had the following objectives: 1) Ascertain North Central's interest in involvement in a commuter system, i.e. a system like the Allegheny commuter system; 2) Discuss their attitude towards administering a flow-through subsidy system; 3) Evaluate their intentions toward future service at low-density points in South Dakota; and 4) Discuss the problems that they think would affect any short-haul air transportation system, especially commuter, in the South Dakota market.

#### Involvement in Commuter Operations

The North Central personnel stated that the company could not seriously consider involvement or interest in commuter operations. They stated that present union contracts forbid flying routes and providing service to points certified to North Central by other than North Central flight crews. Therefore, a system like the Allegheny commuter system would not be possible.

The possibility of having North Central crews fly the smaller, commuter aircraft, i.e. Beech 99's or Twin Otters, was also discounted. They stated that they would be required to pay

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<sup>1</sup>Interview with Jon Harty and David E. Moran, North Central Airlines, Inc., Minneapolis, Minnesota, 5 September 1975.

the crews the same wage rates they received for the Convair 580's which would be too high for the operations of the smaller aircraft. They confided that some crew members have privately stated that they would step down to smaller aircraft but they felt that the pilots union wouldn't allow this to occur. According to them, it is not, at least at this time, a stated union position.

#### Flow-Through Subsidy

The executives stated that the company wouldn't want to administer a step-down or flow-through subsidy to a commuter carrier. They asserted that administrative costs as well as the need for additional personnel would make this undesirable for North Central. When asked if this function could be incorporated into a present administrative office, they replied that a whole new office and staff would be required.

These gentlemen summed up North Central's attitude toward this concept by stating that their company prefers to have the CAB handle all subsidy payments. They strongly endorsed the direct payment of subsidy to commuter carriers by the CAB rather than local carrier administration of a subsidy program.

The reader will recall that proposed plans that involve subsidy for commuter carriers providing service on abandoned local carrier routes also require that the local carrier provide service on these routes if the commuter fails. It is likely that this type of stipulation would remain in any program involving the subsidy of commuter airlines flying routes formerly served by local carriers.

### Service Deletion at Low Density Points

The question of continued service at low-density points in South Dakota directly affects commuter feasibility. If North Central were to request authority to cease service at these points, then the opportunity would be present for the initiation of commuter service.

When questioned about this possibility the North Central personnel stated that, at the present time, there are no South Dakota cities facing the immediate loss of scheduled air service. They said, however, that in the longer run these low-density points may be deleted if they don't increase their passenger boardings. According to them, there just isn't enough travel generated at these points to justify continued service in the long run.

The retirement of North Central's fleet of fifty-passenger Convair 580's was also discussed. According to these officials, present plans call for the retention of five or six of these aircraft through 1985. They will be used to serve select routes. Although not stated, I assumed these routes would have to be those serving low-density points. Thus, although they are moving toward an "all-jet" fleet of aircraft, the company is hedging a bit in terms of their need to continue to supply service to low-density points.

### Serving the South Dakota Market

When asked to characterize the problems facing them in supplying short-haul service in South Dakota, they said the automobile and the interstate highway system are their chief rivals. According to them, consumers are using their personal vehicles for inter-city travel and this habit is deeply entrenched and not easily combated.

They said that a commuter carrier would face the same problems. In addition, they stated the opinion that most commuter carriers are lacking in the experience and expertise required to operate an airline system. According to them, commuters frequently overestimate their ability and underestimate the financial and management requirements for operating an airline. They stated that aircraft manufacturers figures evaluating a potential system often times don't reflect true market conditions. Actual costs often overrun estimated costs and cause financial difficulties. They expressed the view that a commuter should use an aircraft that is easy to maintain, has reasonable speed and passenger capacity, and has demonstrated its applicability to commuter operations.

In summary, North Central isn't interested in involvement in a commuter airline system. They would prefer to remain aloof of any system involving commuter subsidization. This attitude would rule out any system similar to the Allegheny commuter operation. At the present time it appears highly unlikely that any prospective commuter system can hope to receive cooperation, financial guarantees,

or auxilliary commitments from North Central. In defense of North Central, union contracts prevent the consideration of many of these options. Nevertheless, it appears that if a commuter system initiates service in South Dakota it will do so without assistance from North Central Airlines.

## CHAPTER VIII

### SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATIONS

#### Summary

This research was conducted with specific objectives in mind. They are:

1. To describe in detail the growth and characteristics, of the commuter industry in the United States and relate the national experience to the feasibility of a commuter system in South Dakota.
2. To evaluate the technical, economic, and airport facility issues that would affect commuter feasibility in South Dakota.
3. To evaluate the attitudes and opinions of interested groups in potential commuter service points in South Dakota as they relate to commuter feasibility.
4. To conclude concerning commuter feasibility and/or suggest areas that require further research and analysis.

Achievement of these objectives was accomplished, primarily, through the study of the commuter industry as it exists in other areas of the United States and extrapolation of this experience to the possible role of commuters in the South Dakota air transportation system.

Users and factors affecting usage as well as operating cost components for short-haul air transportation were identified. A hypothetical route in South Dakota was used to evaluate the

economics of using different aircraft on the short-haul, low-density South Dakota air transportation market.

The evaluation of South Dakota's airport and radio navigation system pointed out facility deficiencies affecting the potential for incorporating many cities into a commuter system. A survey of affected organizations and persons did not reveal a strong base of support for a commuter system.

#### Findings

Important findings developed include:

1. The commuter airline industry has demonstrated positive expansion and growth in recent years and has established itself as a viable segment of our national air transportation system.

2. Commuter airlines, with their diverse operational approaches to local transportation requirements and their economic aircraft, are well equipped to serve small, low-density airports.

3. Commuter feasibility in South Dakota, as elsewhere, would be enhanced if commuter carriers were able to establish operations which include such financial and operational arrangements as subsidy, joint fares agreements, air mail contracts, and air cargo business.

4. Travelers on business, who demand greater frequency of service, would most likely be the primary consumers in the short-haul airline market, i.e. a commuter system.

5. Estimates of costs related to local airline operations (subsidy and direct and indirect operating costs) are such that

selected commuter aircraft can offer greater flight frequencies than can the DC-9 and the CV-580 while offering lower per-passenger operating costs and greater fuel economy on a hypothetical South Dakota route.

6. Because of inadequate facilities, South Dakota's airport and air navigation system would allow only nine cities to be involved in a commuter system. Other airports could be brought into service only after considerable improvements were completed, i.e. terminal facilities, airport and runway lighting, radio navigation and air to ground communication facilities, ramp and taxi-way paving, airport security, etc.

7. Most groups and individuals contacted via mail questionnaires expressed an interest in a commuter system only as a supplement to the present airline service. Moreover, most did not express an interest in becoming directly involved in the establishment and operation of a commuter system.

#### Conclusion and Recommendations

It is doubtful that a commuter airline system could be established successfully in South Dakota at this time. Unless changes occur in local carrier service to the state, i.e. cessation of service to certain cities, it appears unlikely that a commuter system would receive adequate support; therefore it would be doomed to failure.

On the other hand, if a broad base of interest and support for commuter operations can be generated; if subsidization of the



third level industry becomes a reality; if air cargo, air mail and joint fares agreements can be gained for a South Dakota commuter operator; and if South Dakota actively undertakes a program of commuter airline support and advocacy; then a system might be established which could provide a high level of quality airline service to the state.

If the state and its' cities and towns as well as individual enterprises are interested in pursuing the goal of establishing a commuter system, further research designed to answer the following questions is recommended:

1. What level of usage is required for various aircraft on an entire route system if passenger demand alone is to adequately support a commuter operation?

2. What are the requirements, if any, for airmail and air cargo revenue as a supplement to passenger revenue?

3. What is the probability of obtaining joint fares agreements with all local and trunkline carriers serving this region?

4. Which airports in the state are likely sites for commuter service and what costs, if any, are required to bring them up to minimum standards of operation--capable of supporting IFR operations on a daily basis.

5. Which are the most desirable aircraft to use on a system in terms of operating costs, fuel economy, ease of maintenance, versatility, durability, and flexibility?

## APPENDIX 1

### SPECIFIC COMMUTER OPERATIONS

Commuter Airlines, like many other competitive entities, operate under a variety of different geographic and demographic conditions. The following brief discussion of different companies operating in different areas illustrates the diversity of the third level industry. The unusually successful Allegheny Commuter System, is discussed in somewhat more detail.

#### Altair Airlines

The New York area displays the diversity of size present in the commuter industry. The operators range in size, for example, from the one-aircraft operation of Downtown Airlines to the 10-aircraft fleet of Altair Airlines. Altair is unusual in the respect that it avoids the major New York terminals--Newark, Kennedy, and LaGuardia--and serves stops such as Westchester Co. Airport at White Plains and MacArthur Airport at Islip. It is also rather unusual because it maintains a single-type aircraft fleet--Beech Model 99's.<sup>1</sup>

The Altair aircraft are utilized on a variety of routes. The most lucrative one, between Philadelphia and Richmond, is also the longest stage at 197 miles. Other points served include

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<sup>1</sup>Warren C. Wetmore, "N.Y. Area Commuters Seek Acceptance," Aviation Week & Space Technology, September 23, 1974, p. 66.

Hartford, Washington, Baltimore, Wilmington, Harrisburg, Williamsport, Allentown, Wilkes-Barre/Scranton, and Bridgeport and Albany.<sup>2</sup>

Altair is similar to certified carriers in its use of computer software technology in such areas as payroll, maintenance, interline billing, accounting, and other uses. This software package has been sold to several small carriers including Air New England. It taps into the Control Data Corporation system in Atlanta for its computerized reservation system. Terminals at Philadelphia International Airport used by six operators accomplish this aspect of their operations. Altair performs all aircraft and nearly all engine maintenance itself.<sup>2</sup>

The operational costs of the Altair system require a break even load factor of seven to nine passengers (47 to 60 percent) depending on the stage length.<sup>3</sup> The company's average load factor is above that and certain runs, such as to Richmond, are often booked full well in advance of the flight. Altair's flight crews, while organized into a company union, are not part of the Air Line Pilots' Association (ALPA). This may be beneficial in controlling crew costs and thus operating costs.

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<sup>1</sup>Ibid.

<sup>2</sup>Ibid.

<sup>3</sup>Stage length refers to the distance between particular service points on a route system.

Pilgrim Airlines

Pilgrim Airlines of New London, Connecticut, maintains fourteen crews which are not unionized. They man the airline's six Twin Otters and one Volpar-converted turbo-prop-powered Beech Model 18.<sup>1</sup>

The Pilgrim operation boards an average of 10,000 passengers per month. The Twin Otters are used about seven hours per day and fly approximately 180,000 miles monthly on the line's unduplicated route structure of 1,200 miles. About a 40 percent load factor, or seven to eight seats, is required to break even with the Twin Otter.<sup>2</sup>

Cities served, in addition to New London/Groton, the home base, and Montreal, include Hartford, Boston, Bridgeport, New Haven, Albany, and New York-Kennedy. Interline passengers (passengers connecting to or from certified airlines) comprise about 80 percent of their passenger business. Pilgrim has nine direct flights from New London to Kennedy daily; six are non-stop. The other most frequently served route is the Kennedy-New Haven run with seven daily flights.<sup>3</sup>

The airline uses Braniff's computer system for all reservations. Operations such as billing, maintenance records, accounting,

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<sup>1</sup>Wetmore, "N.Y. Area Commuters," p. 66.

<sup>2</sup>Ibid.

<sup>3</sup>Ibid.

and general record keeping are done by four clerks. Actual maintenance work includes all airframe and everything except complete overhaul on the engines.<sup>1</sup>

Pilgrim has agreements with the major domestic carriers serving Kennedy for interline ticketing and baggage handling. It also has established joint fare agreements with Braniff and National--two of the nation's trunklines. The concept of joint fares is discussed in more detail in Chapter III.

#### Swift Aire Lines

Swift Aire, operating out of San Luis Obispo, California, had, in 1974, progressed from operating seven-seat light twin-engine aircraft to consideration of an aircraft capable of carrying thirty passengers. All of this occurred in a brief period of five years.<sup>2</sup>

Swift Aire operates commuter routes in the San Joaquin Valley and the California coastal area. In 1974, they were operating six fifteen passenger deHavilland Herons which are small, four-engine transports. In May of 1975, they planned to begin taking delivery of at least four twenty-two passenger Saunders ST-27's which is similar to the Heron but is ten feet longer and

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<sup>1</sup>Ibid., p. 67.

<sup>2</sup>"Swift Aire Grows With California Market," Aviation Week & Space Technology, September 23, 1974, p. 69.

powered by two United Aircraft of Canada, Ltd., PT6A-34 turbo-prop powerplants.<sup>1</sup>

In marked contrast to most commuter operations throughout the country, Swift Aire employs stewardesses. These cabin attendants serve beverages, cocktails, and snacks on all of the carriers 110 daily flights which serve ten California communities.<sup>2</sup>

In addition to their scheduled operations, Swift Aire maintains a charter service which increases the utilization of their aircraft. Clients include the U.S. Forest Service who uses Swift Aire to fly "hot-shot" crews of specialists to battle forest fires; the State of California who moves mental patients from one hospital to another by Swift Aire charter; and weekenders taking recreational trips to resort areas such as Lake Tahoe.<sup>3</sup>

The airline employs thirty-five of its total employee force of 115 in its maintenance department. Nearly all maintenance is performed by company employees because the airlines headquarters is located two hundred miles from the industry centers that could perform the work.<sup>4</sup>

Swift Aire's connections with other airlines include inter-line ticketing and baggage agreements with nearly every airline serving the West Coast and joint fare agreements with American,

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<sup>1</sup>Ibid.

<sup>2</sup>Ibid., p. 70.

<sup>3</sup>Ibid.

<sup>4</sup>Ibid.

Hughes Air West, and Delta. Continental and United provide the commuter ticketing and baggage services which lends credibility to Swift Aire's operations and reduces its personnel requirements. The commuter pays a fee that helps defray the cost for such services.<sup>1</sup>

#### Air Wisconsin

Air Wisconsin, a Mid-West carrier that operates out of Appleton, Wisconsin began service in 1965 with a single nine-passenger DeHavilland Dove. By 1973, they were operating three fifteen-passenger Beech 99's and four seventeen-passenger DeHavilland of Canada Twin Otters. In May of 1973 they began taking delivery of three Sweargin Metro nineteen-passenger turbo-prop commuter aircraft which were intended to replace the Beech 99's. In 1973, the airline operated sixty-seven scheduled flights on a daily basis while serving nine communities in Minnesota, Indiana, Illinois, and Wisconsin.<sup>2</sup>

The Twin Otters are used on night mail and freight flights after their passenger seats are stripped out at the end of their normal day. The aircraft carry approximately a 77 percent load factor in mail/freight cargoes as they are used from approximately 9:00 p.m. through about 5:00 a.m.<sup>3</sup>

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<sup>1</sup>Ibid.

<sup>2</sup>"Commuter Line Gets Pressurized Metros," Aviation Week & Space Technology, May 21, 1973, p. 47.

<sup>3</sup>Ibid.

The airline has a high utilization of its aircraft. The 99's are in use 8.5 hours per day, five days a week. They are not used on Saturdays but fly for about four and one half hours on Sunday. The Twin Otters, the real workhorses of the fleet, average fourteen to fifteen hours daily use.<sup>1</sup>

Out of a total employment of approximately 160, the publicly-owned company with about 700 stockholders maintains eleven fulltime mechanics and forty-eight pilots. Three management personnel are also qualified pilots.<sup>2</sup>

#### Air Midwest

Air Midwest is a small commuter that had two Beech 99 A jetprop airlineers; two twin-engine Cessna 402's and one single-engine Cessna 206 in 1973. They serve the hubs of Kansas City, Wichita, and Denver through their route structure.<sup>3</sup>

Their primary markets are the western Kansas cities of Hutchinson, Salina, Hays, Dodge City, Great Bend, and Garden City. These points produce over 90 percent of the airline's passengers, freight, and mail revenues.<sup>4</sup>

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<sup>1</sup>Ibid.

<sup>2</sup>Ibid.

<sup>3</sup>U.S. Senate, Committee on Commerce, Local Air Service to Small Communities, Hearing before a subcommittee of the Senate Committee on Commerce on S. 796, 92nd Cong., 2nd session, 1972, p. 139.

<sup>4</sup>Ibid.



The Beech 99's fly routes providing scheduled service through the western Kansas communities to Kansas City, Wichita, and Denver. In addition, the Cessna 402's supplement this service with early morning and evening flights between Dodge City, Garden City, Wichita, and Kansas City. This route system is tied in with an air-taxi mail contract that is flown between Dodge City and Pueblo, Colorado.<sup>1</sup>

In 1973, the airline employed sixty-one personnel and performed all of its own maintenance. It has, in addition, complete interline communications with other airlines. In 1971, for example, 65 to 70 percent of the commuters' passengers interlined to or from local or trunk carriers at the three hub terminal points on the carrier's route system.

Table 23 shows the number of passengers and tons of mail and cargo flown by the selected airlines from 1970 through 1974. The overall picture is one of growth--typical of the commuter industry. For example, Altair displayed a 76.9 percent increase in its' passenger traffic from 1970 to 1974. Air Midwest, operating in an air service environment similar to that of South Dakota--low-density in some communities--recorded an increase of 22.8 percent in enplaned passengers from 1970 to 1974.

When one compares the various commuter airlines discussed, the diversity of the third level industry becomes apparent.

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<sup>1</sup>Ibid.

TABLE 23

SELECTED COMMUTER AIRLINES: PASSENGER, CARGO,  
AND MAIL TRAFFIC--1970-1973

Airline	Passengers		Cargo		Mail	
	000	Percent Change	Tons	Percent Change	Tons	Percent Change
1970						
Altair	77.9		132.6		0	
Air Wisconsin	115.7		1289.2		395.7	
Swift Aire	11.4		10.8		0	
Air Midwest	29.4		80.8		72.2	
Pilgrim	80.7		45.0		551.8	
1971						
Altair	96.8	+ 24.2	116.3	- 9.1	0	
Air Wisconsin	123.6	+ 6.8	1703.5	+ 32.1	686.4	+ 73.5
Swift Aire	29.9	+163.5	29.7	+173.8	0	
Air Midwest	32.9	+ 11.8	109.1	+ 35.0	82.1	+ 13.7
Pilgrim	83.1	+ 3.0	52.6	+ 16.7	1463.8	+165.3
1972						
Altair	91.5	- 5.9	53.2	- 54.3	0	
Air Wisconsin	147.1	+ 19.0	2106.7	+ 23.7	963.8	+ 40.4
Swift Aire	43.9	+ 46.8	48.5	+ 63.5	0	
Air Midwest	37.3	+ 13.5	165.3	+ 51.4	85.4	+ 4.0
Pilgrim	104.0	+ 25.1	77.6	+ 47.7	1440.2	- 1.6

TABLE 23--Continued

Airline	Passengers		Cargo		Mail	
	000	Percent Change	Tons	Percent Change	Tons	Percent Change
1973						
Altair	137.8	+ 51.2	173.2	+225.8	0	
Air Wisconsin	163.8	+ 11.4	2600.2	+ 23.4	829.7	- 13.9
Swift Aire	24.6	- 43.9	61.3	+ 26.3	0	
Air Midwest	36.1	- 3.3	207.9	+ 25.8	71.5	- 16.2
Pilgrim	99.6	- 4.3	69.6	- 10.3	1442.3	+ 0.2

SOURCE: U.S. Department of Transportation, Civil Aeronautics Board, Commuter Air Carrier Activity--Year Ended December 1970 (Washington, D.C.: U.S. Government Printing Office, 1971), p. 5; U.S. Department of Transportation, Civil Aeronautics Board, Commuter Air Carrier Activity--Year Ended December 1971 (Washington, D.C.: U.S. Government Printing Office, 1972), p. 5; U.S. Department of Transportation, Civil Aeronautics Board, Commuter Air Carrier Activity--Year Ended December 1972 (Washington, D.C.: U.S. Government Printing Office, 1973), p. 5; and U.S. Department of Transportation, Civil Aeronautics Board, Commuter Air Carrier Activity--Year Ended December 1973 (Washington, D.C.: U.S. Government Printing Office, 1974), p. 7.

Conversely, there are many areas where these commuters are using similar operational practices, agreements, and procedures which help to perpetuate their operations and increase their participation in the scheduled airline industry.

The commuter operators discussed all operate autonomously in terms of their route systems. They began service without the direct aid from any established airline system. One group of commuters do, however, maintain a strong identity with an established

local carrier. They are the members of the Allegheny commuter system.

### Allegheny Commuter System

Allegheny Airlines established a commuter system operation in 1967 in an attempt to deal with the problem of insufficient passenger volume for its larger aircraft--Convair 580 and McDonnell Douglas DC-9. Because of its responsibility to provide scheduled air transportation to many cities that weren't producing passengers, it devised a commuter system. The airline had decided that the best way to serve smaller communities was to contract the service to a local operator using small twin-engine aircraft. This originated a unique approach to the problem of serving smaller communities with adequate air transportation.<sup>1</sup> Tables 24 and 25 trace the development of the system.

Table 24 shows that the Allegheny system has displayed continual growth. For example, the number of flight departures scheduled--a good indication of the increase in demand for the service--increased by a factor of 33.3 times from 1968 to 1974. Their completion factor, averaging 96.2 percent over the life of the system, compared favorably with that of the trunkline and local air carriers. This is indicative of a well run system.

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<sup>1</sup>Ellingsworth, "Allegheny System Aids Local Operators," p. 71.

TABLE 24

## ALLEGHENY COMMUTER SERVICE GROWTH--1968-1974

Year	Flight Departures Scheduled	Flight Departures Completed	Completion Factor
1968	5,062	4,941	97%
1969	17,307	16,650	96%
1970	43,492	41,698	96%
1971	77,793	74,141	95%
1972	99,880	95,885	96%
1973	136,650	132,028	97%
1974	168,728	161,680	96%

SOURCE: Allegheny Commuter Fact Sheet (Washington, D.C.: Allegheny Airlines, March 15, 1975), p. 1.

Table 25 displays the large gains the system has made in terms of available seats, passenger boardings, and cargo carried. These factors increased by 50.3 times, 41.5 times, and 10.05 times, respectively, from 1968 to 1974. These figures testify to the fact that the Allegheny commuter system has filled a need in the air transportation system of the area it serves.

The system was designed to fit the scheduled air transportation needs of the communities involved by using local businesses economically tied to the community. The concepts of service and local identity are considered to be the cornerstones of this concept.

TABLE 25

## ALLEGHENY COMMUTER PASSENGER AND CARGO TRAFFIC--1968-1974

Year	Available Seats	Passenger Boardings	Cargo Carried (Tons)
1968	67,632	26,304	483.7
1969	244,650	99,355	1,712.7
1970	622,114	250,477	3,186.7
1971	1,125,479	435,500	3,416.9
1972	1,590,249	609,561	3,845.6
1973	2,231,046	865,984	5,333.3
1974	3,400,880	1,092,160	4,861.9

SOURCE: Allegheny Commuter Fact Sheet (Washington, D.C.: Allegheny Airlines, March 15, 1975), p. 2.

In order to maintain the "Allegheny image," all commuters are required to paint their aircraft with Allegheny markings and to have "Allegheny Commuter" painted on the side of the fuselage. Thus, the consumer identity with Allegheny is established and maintained through the commuter operation.

The basic contract with each local operator provides for cessation of service by Allegheny to the cities involved. In order to allow the commuter operators to obtain long-term financing and to display continuity and stability to the community, the contract is made for a ten-year period. In addition, if the operator desires, Allegheny will guarantee a break even financial prospectus for the

first two years of operation. The commuters are required to complete 95 percent of their scheduled flights in providing service to Allegheny approved points, use pilots who meet Federal Aviation Administration standards, comply with Allegheny's standards of "customer service," and provide their own aircraft maintenance. Allegheny provides other services for the commuter such as interline ticketing, reservation processing, and baggage and passenger handling.<sup>1</sup>

The twelve Allegheny Commuters use three different aircraft in serving nearly twenty routes formerly flown by Allegheny. In 1973, the fleet consisted of twenty-one, fifteen-passenger Beechcraft 99's, twelve nineteen-passenger deHavilland of Canada Twin Otters, and four twenty-six-passenger Nord 262's. The aircraft are twin-engine jet-props equipped to Allegheny standards which include: weather radar, transponders, distance measuring equipment (DME), and other electronic aids required to operate in and out of major terminals under all weather conditions. This equipment compares favorably to that carried on many certified carrier aircraft.<sup>2</sup>

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<sup>1</sup>Allegheny Commuter Report 1973 (Washington, D.C.: Allegheny Airlines, 1973), p. 8.

<sup>2</sup>Ibid.

## APPENDIX 2

## SOUTH DAKOTA AIR CARRIER AIRPORTS FACILITY INVENTORY

Airport	Length of Longest Runway (feet)	Navigation Aids	Lighting	Fuel	Maintenance/ Repairs	Terminal
Aberdeen	6900	VORTAC ILS	MIRL MALS HIRL RAIL REIL Beacon	80/87 100/103 Jet	Major	Yes
Brookings	5428	VOR	REIL MIRL Beacon	80/87 100/130	Major	Yes
Huron	7200	VORTAC ILS LOM	MIRL Beacon HIRL REIL	80/87 100/130 Jet	Major	Yes
Mitchell	6705	VOR	MIRL REIL Beacon	80/87 100/130 Jet	Major	Yes
Pierre	6898	VORTAC ILS	HIRL REIL Beacon	80/87 100/130 Jet	Major	Yes
Sioux Falls	9000	VORTAC NDB ILS LOM	HIRL Beacon MIRL REIL	80/87 Jet 100/130 115/145	Major	Yes



Watertown	6900	VORTAC ILS	HIRL Beacon MIRL REIL	80/87 100/130	Major	Yes
Yankton	5300	VOR	MIRL Beacon REIL	80/87 100/130	Major	Yes

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SOURCE: South Dakota Airport Directory (Pierre, S.D.: South Dakota Aeronautics Commission, January 1, 1975), pp. 1-60.

NOTE: All terms are listed and defined in the Glossary of Terms.

## APPENDIX 3

## SOUTH DAKOTA POSSIBLE FUTURE COMMUTER AIRPORTS FACILITY INVENTORY

Airport	Length of Longest Runway (feet)	Navigation Aids	Lighting	Fuel	Maintenance/ Repairs	Terminal
Gregory	3300	No	MIRL Beacon	80/87 100/130	Minor	No
Hot Springs	4500	No	MIRL Beacon	80/87 100/130	Minor	No
Hoven	2900	No	LIRL Beacon	80/87	None	No
Lemmon	4500	VOR <sup>a</sup>	MIRL Beacon	80/87 100/130	Major	No
Madison	3100	NDB	LIRL Beacon	80/87 100/130	Major	No
Milbank	3000	No	LIRL Beacon	80/87 100/130	Minor	No
Miller	2800	No	LIRL Beacon	80/87 100/130		No
Mission	3200	No	MIRL Beacon	None	None	No
Mobridge	4400	VOR <sup>a</sup>	MIRL Beacon	80/87 100/130	None	No

Murdo	3400	No	MIRL Beacon	None	Major	No
Pine Ridge	5200	No	MIRL Beacon	None	None	No
Redfield	2900	No	LIRL Beacon	80/87	None	No
Sisseton	2900	No	MIRL Beacon	80/87	None	No
Spearfish	3800	No	No	80/87 100/130	Major	No
Sturgis	3000	No	MIRL Beacon	80/87 100/130	Major	No
Wagner	3000	No	LIRL Beacon	80/87 100/130	Major	No
Webster	3100	No	LIRL Beacon	80/87 100/130	None	No

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SOURCE: South Dakota Airport Directory (Pierre, S.D.: South Dakota Aeronautics Commission, January 1, 1975), pp. 1-60.

NOTE: All terms are listed and defined in the Glossary of Terms.

<sup>a</sup>Usable for VFR operations only.

APPENDIX 4

QUESTIONNAIRE OF FIXED BASE OPERATORS

IN SOUTH DAKOTA

1. How many pilots do you have in your operation? \_\_\_\_\_
2. How many pilots do you have with an ATP, multi-engine rating?  
\_\_\_\_\_
3. How many pilots do you have with commercial, multi-engine, and instrument ratings? \_\_\_\_\_
4. If you don't already have them, do you foresee any problem in obtaining qualified flight crews for a commuter operation? (Captains would require an ATP rating; First Officers would require commercial, multi-engine, and instrument ratings.)  
Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, what types of problems do you foresee?

5. Do you currently operate any multi-engine aircraft?  
Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, what types?

6. Do you perform your own maintenance?  
Yes \_\_\_\_\_ No \_\_\_\_\_ If yes, what are your maintenance capabilities? Minor \_\_\_\_\_ Major \_\_\_\_\_
7. Would your mechanics have the experience or be able to obtain the training required to work on aircraft like the Beech 99 or Twin Otter? Yes \_\_\_\_\_ No \_\_\_\_\_

Please estimate the cost of extra training to service such aircraft, if required. \$ \_\_\_\_\_

Comments.

8. Would you need additional hangar space, APU's, tools, and specialized equipment to perform maintenance on the previously mentioned aircraft?

Yes \_\_\_\_\_ No \_\_\_\_\_

If new equipment and facilities would be required, please estimate their cost to you. \$ \_\_\_\_\_

Comments.

9. If you were flying a commuter operation, what type of a maintenance system would be most economical and satisfactory?

A. Centralized maintenance facility established to serve several operators \_\_\_\_\_

B. Individual maintenance performed by operators \_\_\_\_\_

Comments.

10. What are your sources for operating or for expansion funds? Please include the approximate percentage for each source, i.e. 30% internally-generated, 20% banks, etc.

\_\_\_\_\_ Internally-generated  
 \_\_\_\_\_ Banks  
 \_\_\_\_\_ Small Business Administration  
 \_\_\_\_\_ Insurance Companies  
 \_\_\_\_\_ Other (Please specify)

11. If a commuter system similar to the Allegheny system was determined feasible for South Dakota, would you be able to obtain sufficient funds or credit to finance the purchase of at least one aircraft in the Beech 99 and Twin Otter class?

Yes \_\_\_\_\_ No \_\_\_\_\_

If not, what percentage of the necessary funds or credit might you expect to be able to obtain? \_\_\_\_\_%

12. Assuming a flight frequency of at least 2 departures per day from your community to regional cities with an aircraft in the Beech 99 or Twin Otter class, how much would it affect your current volume of charter business?

\_\_\_\_\_ A great deal (Reduce it 50% or more).  
 \_\_\_\_\_ Some effect (Reduce it 10% to 50%).  
 \_\_\_\_\_ Little effect (Reduce it less than 10%).  
 \_\_\_\_\_ No effect.

Comments.

13. What reduction in gross revenues would you estimate would result if the operation mentioned in 12 were implemented? Check one.

\_\_\_\_\_ 0 to 25%  
 \_\_\_\_\_ 25 to 50%  
 \_\_\_\_\_ 50 to 75%  
 \_\_\_\_\_ 75 to 100%

14. What reduction in your net revenues do you estimate would result from the operation mentioned in #12. Check one.

\_\_\_\_\_ 0 to 25%  
 \_\_\_\_\_ 25 to 50%  
 \_\_\_\_\_ 50 to 75%  
 \_\_\_\_\_ 75 to 100%

15. Would you be interested in becoming involved in the type of commuter operation previously mentioned?

Yes \_\_\_\_\_ No \_\_\_\_\_

Please indicate your reasons for your answer.

16. If you were involved, would you require additional management and support personnel?

Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, how many?

\_\_\_\_\_ Management  
\_\_\_\_\_ Support (Flight line personnel, mechanics,  
clerical, etc.)

Please give an estimate of the extra cost involved in the extra personnel in question #16. \$ \_\_\_\_\_

17. Do you feel that a commuter system could successfully operate in the state?

Yes \_\_\_\_\_ No \_\_\_\_\_

Please comment on the reasons for your answer.

APPENDIX 5

RESPONSES TO QUESTIONNAIRE OF FIXED BASE

OPERATORS IN SOUTH DAKOTA

1. <u>Number of Pilots</u>	<u>Responses</u>
1	
2	
3	2
4	3
5	4
6	
7	
8	3

2. 21

3. 42

4. Yes -- 0  
No -- 12

5. Yes -- 11  
No -- 1

Types -- Piper (Aztec, Seneca, Navajo & Twin Comanche)  
-- Cessna (337, 310 and 401)  
-- Beech (18 and 99)

These aircraft are all twin engine with seating capacities from four to fifteen passengers.

6. Yes -- 9  
No -- 3

Major -- 8  
Minor -- 1

7. Yes -- 10  
No -- 2

Estimated costs varied from \$500 to \$10,000. Six respondents who replied "yes" to the first part of the question didn't estimate a cost.



8. Yes -- 6  
No -- 6

Estimated costs varied from \$15,000 to \$75,000.

9. Centralized Maintenance -- 6  
Individual -- 4  
No Response -- 2
10. Internally Generated -- 8  
Small Business  
Administration -- 5  
Insurance Companies --10  
Banks --10  
Other -- 3
11. Yes -- 9  
No -- 2  
No Response -- 1

Estimates varied from "very small" to 100 percent with most indicating some ability to raise capital for the acquisition of an aircraft.

12. A Great Deal -- 2  
Some Affect -- 1  
Little Affect -- 5  
No Affect -- 4
13. 0 to 25% -- 7  
25% to 50% -- 1  
50% to 75% -- 2  
75% to 100% -- 0  
No Response -- 2
14. 0 to 25% -- 9  
25% to 50% -- 0  
50% to 75% -- 0  
75% to 100% -- 1  
No Response -- 2
15. Yes -- 7  
No -- 4  
No Response -- 1
16. Yes -- 5  
No -- 1  
No Response -- 5

Estimates for personnel were:

Management -- 4

Support -- 8

No estimates of cost were given.

17. Yes -- 2

No -- 5

No Response -- 5

APPENDIX 6

QUESTIONNAIRE OF CHAMBERS OF COMMERCE,

CITY GOVERNMENTS, AND AIRPORT

BOARDS IN SOUTH DAKOTA

1. How important is air transportation to the economic stability and growth of your community? Check one.

\_\_\_\_\_ Extremely important  
\_\_\_\_\_ Moderately important  
\_\_\_\_\_ Relatively unimportant  
\_\_\_\_\_ Totally unimportant

Please elaborate on the reasons for your selection.

2. How would you rank the present air carrier service in your community? Check one.

\_\_\_\_\_ Outstanding  
\_\_\_\_\_ Very adequate  
\_\_\_\_\_ Average  
\_\_\_\_\_ Barely adequate  
\_\_\_\_\_ Not acceptable

3. If your selection in the previous question was "average" or below, what is the primary weakness in the current air carrier service? Check one.

\_\_\_\_\_ Poor scheduling  
\_\_\_\_\_ Insufficient frequency of arrivals and departures  
\_\_\_\_\_ Other (Please specify)

4. Do you feel that a commuter airline system could offer better air transportation to your community? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, why?

If no, why not?

5. How would a commuter airline system affect the economic well-being of your community? Check one.

\_\_\_\_\_ Negatively  
\_\_\_\_\_ Positively

Please explain why you chose your answer.

6. Considering present community use of air transportation, do you think your citizens would accept and use a commuter system in lieu of the present air carrier? Yes \_\_\_\_\_ No \_\_\_\_\_

If no, why?

If yes, would there be an increase in the volume of usage?

7. If a commuter operation required some subsidy, would your community be willing to help finance this subsidy?  
Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, how much could your community afford on a monthly basis?

\$ \_\_\_\_\_

If no, why?

APPENDIX 7

RESPONSES TO QUESTIONNAIRE OF CHAMBERS  
OF COMMERCE, CITY GOVERNMENTS, AND  
AIRPORT BOARDS IN SOUTH DAKOTA

1. Extremely Important -- 12  
Moderately Important -- 1  
Relatively Important -- 0  
Totally Important -- 0
  
2. Outstanding -- 3  
Very Adequate -- 5  
Average -- 4  
Barely Adequate -- 0  
Not Acceptable -- 1
  
3. Poor Scheduling -- 1  
Insufficient Frequencies -- 5  
Other -- 1
  
4. Yes -- 7  
No -- 3  
No Response -- 3
  
5. Negatively -- 2  
Positively -- 9  
No Response -- 2
  
6. Yes -- 6  
No -- 7
  
7. Yes -- 0  
No -- 9  
No Response -- 4

## BIBLIOGRAPHY

### National

- "Airline Observer." Aviation Week & Space Technology, September 22, 1975, p. 29.
- "Airline Traffic--April 1975." Aviation Week & Space Technology, July 21, 1975, p. 34.
- "Air New England Named Local." Aviation Week & Space Technology, July 22, 1974, p. 18.
- Allegheny Commuter Fact Sheet. Washington, D.C.: Allegheny Airlines, March 15, 1975.
- Allegheny Commuter Report 1973. Washington, D.C.: Allegheny Airlines, 1973.
- Bennett, Randall P., Chief, Domestic Passenger Fares Section, Civil Aeronautics Board. Letter to Tom Hruby. Explanation of Joint Fares. 9 August 1975.
- Brown, David A. "Rules Spur Commuter Aircraft Work." Aviation Week & Space Technology, September 23, 1974, p. 81.
- Bulban, Erwin J. "New Airline to Carry Hazardous Cargo." Aviation Week & Space Technology, August 18, 1975, pp. 31-33.
- Burkhardt, Robert. "Why Not Subsidy for Third Levels?" Airline Management, June 1972, pp. 37-38.
- "CAB Clarifies Payload Rule." Aviation Week & Space Technology, September 25, 1972, p. 28.
- Campbell, B. J. North Central Airlines Enplaned Passengers--1974. Minneapolis, Minn.: North Central Airlines, May 10, 1976.
- "Commuter Line Gets Pressurized Metros." Aviation Week & Space Technology, May 21, 1973, p. 47.
- Covault, Craig. "Air Taxi Mail Growth Stabilizes Carriers." Aviation Week & Space Technology, December 11, 1972, pp. 29-33.
- Cover, Virgil D. "The Rise of Third Level Air Carriers." Transportation Journal, Fall 1971, pp. 41-51.

- Eads, George C. The Local Service Airline Experiment. Washington, D.C.: The Brookings Institution, 1972.
- Ellingsworth, Rosalind K. "Allegheny System Aids Local Operators." Aviation Week & Space Technology, September 23, 1974, pp. 71-74.
- Farris, Martin T. and Scott, Ronald Dean. "Airline Subsidies in the United States." Transportation Journal, Summer 1974, pp. 25-33.
- Feldman, Joan M. "Joint Fares for the Third Level." Airline Management, August 1972, pp. 36-37.
- "Flow Through Subsidy." Aviation Week & Space Technology, July 21, 1975, p. 28.
- Gregory, William H. "Small-Community Service Plans Proposed." Aviation Week & Space Technology, November 19, 1973, pp. 28-29.
- Harty, Jon. North Central Airlines, Inc., Brookings, South Dakota. Telephone Interview, 23 August 1976.
- Harty, Jon and Moran, David. North Central Airlines, Inc., Minneapolis, Minnesota. Interview, 5 September 1975.
- "Jet Operating Data, B-747, B-737." Air Transport World, September 1975, p. 30.
- Moran, David. North Central Airlines, Inc., Brookings, South Dakota. Telephone Interview, 28 October 1975.
- Parish, Wayne W. "Air Midwest: The Black Ink Commuter." Airline Management, September 1971, pp. 32-33.
- Pickett, James A. "Flow Through Subsidy After First Year." Local Transportation Yearbook--1975. San Francisco, California: Miller Freeman Publications, 1975, pp. 63-64.
- "Price and Cost Indexes for Construction and Selected Components of Construction: 1950-1974." The U.S. Fact Book. New York, N.Y.: Grosset & Dunlap, 1975, p. 708.
- Report Number 3: Commuter Airlines. Washington, D.C.: Commuter Airline Association, July 1975.
- "Rules on Size, Weight Eased for Air Taxis." Aviation Week & Space Technology, July 24, 1972, p. 18.

- Schneider, Charles E. "Carrier Seeks Small Air Package Control." Aviation Week & Space Technology, July 21, 1975, pp. 36-40.
- Schneider, Monte, Director of Aeronautics, South Dakota Department of Transportation. Letter to Tom Hruby. South Dakota Air Transportation. 27 February 1975.
- Vavra, Harold V., Director, North Dakota Aeronautics Commission. Brookings, South Dakota. Telephone Interview, 18 July 1975.
- Watkins, Harold D. "Potential Market Seen in Eased Taxi Rules." Aviation Week & Space Technology, October 4, 1975, p. 26.
- Wetmore, Warren C., "N.Y. Area Commuters Seek Acceptance." Aviation Week & Space Technology, September 23, 1974, pp. 65-68.
- Woolsey, James P. "Locals Predict Rising Subsidy Need." Aviation Week & Space Technology, November 15, 1971, p. 26.

#### Procedural Aids

- Federal Aviation Administration District Office of Rapid City, South Dakota. Brookings, South Dakota. Telephone Interview, 14 January 1975.
- Federal Aviation Administration. General Aviation District Office. Rapid City, South Dakota. Letter to Tom Hruby. South Dakota Air Taxi Operators--1975. 18 August 1975.
- HNB Consulting Engineers. A Study of the Economic Feasibility of Providing Third Level Air Carrier Service in Wyoming. Cheyenne, Wyoming: HNB Consulting Engineers, December 1974.
- Speas, R. Dixon and Associates. Minnesota State Aviation System Plan--Scheduled Air Transportation for Outstate Areas. Minneapolis-St. Paul: R. Dixon Speas and Associates, May 1974.
- South Dakota Airport Directory. Pierre, South Dakota: South Dakota Aeronautics Commission, January 1, 1975.
- U.S. Congress. Senate. Committee on Commerce. Local Air Service to Small Communities. Hearings before a subcommittee of the Senate Committee on Commerce on S. 796. 92d Cong., 2d sess., 1972.
- U.S. Department of Commerce, Bureau of the Census. Census of Population: 1940, Vol. II, Characteristics of the Population, Part 6, Pennsylvania-Texas. Washington, D.C.: U.S. Government Printing Office, 1943.



- U.S. Department of Commerce, Bureau of the Census. Census of Population: 1950, Vol. 1, Number of Inhabitants. Washington, D.C.: U.S. Government Printing Office, 1952.
- U.S. Department of Commerce, Bureau of the Census. Census of Population: 1960, Vol. 1, Characteristics of the Population, Part A, Number of Inhabitants. Washington, D.C.: U.S. Government Printing Office, 1961.
- U.S. Department of Commerce, Bureau of the Census. Census of Population: 1970, Vol. 1, Characteristics of the Population, Part 43, South Dakota. Washington, D.C.: U.S. Government Printing Office, 1973.
- U.S. Department of Commerce, Bureau of the Census. Population Estimates and Projections. Washington, D.C.: U.S. Government Printing Office, 1975.
- U.S. Department of Transportation. Civil Aeronautics Board. Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended June 30, 1962. Washington, D.C.: U.S. Government Printing Office, 1962.
- U.S. Department of Transportation. Civil Aeronautics Board. Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended December 31, 1965. Washington, D.C.: U.S. Government Printing Office, 1966.
- U.S. Department of Transportation. Civil Aeronautics Board. Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended June 30, 1970. Washington, D.C.: U.S. Government Printing Office, 1970.
- U.S. Department of Transportation. Civil Aeronautics Board. Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended June 30, 1972. Washington, D.C.: U.S. Government Printing Office, 1972.
- U.S. Department of Transportation. Civil Aeronautics Board. Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended June 30, 1971. Washington, D.C.: U.S. Government Printing Office, 1971.
- U.S. Department of Transportation. Civil Aeronautics Board. Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended June 30, 1973. Washington, D.C.: U.S. Government Printing Office, 1973.

- U.S. Department of Transportation. Civil Aeronautics Board. Airport Activity Statistics of Certified Route Air Carriers--12 Months Ended June 30, 1974. Washington, D.C.: U.S. Government Printing Office, 1974.
- U.S. Department of Transportation. Civil Aeronautics Board. Commuter Air Carrier Activity; Year Ended 1970. Washington, D.C.: U.S. Government Printing Office, 1971.
- U.S. Department of Transportation. Civil Aeronautics Board. Commuter Air Carrier Activity; Year Ended December 1971. Washington, D.C.: U.S. Government Printing Office, 1972.
- U.S. Department of Transportation. Civil Aeronautics Board. Commuter Air Carrier Activity; Year Ended December 1972. Washington, D.C.: U.S. Government Printing Office, 1973.
- U.S. Department of Transportation. Civil Aeronautics Board. Commuter Air Carrier Activity; Year Ended December 1973. Washington, D.C.: U.S. Government Printing Office, 1974.
- U.S. Department of Transportation. Civil Aeronautics Board. Commuter Air Carrier Traffic Statistics; Year Ended June 30, 1974. Washington, D.C.: U.S. Government Printing Office, 1975.
- U.S. Department of Transportation. Civil Aeronautics Board. Docket 21866-4, Domestic Passenger Fare Investigation, Phase 4--Joint Fares. Washington, D.C.: U.S. Government Printing Office, March 18, 1974.
- U.S. Department of Transportation. Civil Aeronautics Board. Economic Regulations; Part 298; Classification and Exemption of Air Taxi Operators. Washington, D.C.: U.S. Government Printing Office, July 1, 1969.
- U.S. Department of Transportation. Civil Aeronautics Board. Order 73-9-44. Washington, D.C.: U.S. Government Printing Office, September 11, 1973.
- U.S. Department of Transportation. Civil Aeronautics Board. Remarks Before the Association of Local Transport Airlines by John G. Adams. Washington, D.C.: U.S. Government Printing Office, 1970.
- U.S. Department of Transportation. Civil Aeronautics Board. Remarks Before the Association of Local Transport Airlines by Secor D. Browne. Washington, D.C.: U.S. Government Printing Office, 1970.

U.S. Department of Transportation, Civil Aeronautics Board  
Remarks Before the Joint Luncheon of the Kiwanis Club and  
Chamber of Commerce of Wichita, Kansas by Secor D. Browne.  
Washington, D.C.: U.S. Government Printing Office, 1972.

## GLOSSARY OF TERMS

- AIR CARGO:** Any property carried on an aircraft other than mail, stores, and baggage.
- AIR CARRIER:** A person who undertakes directly, by lease, or other arrangement, to engage in air transportation.
- AIR CARRIER OPERATIONS:** Revenue activities of the certified route air carriers and the supplemental air carriers on scheduled and nonscheduled flights.
- AIRCRAFT OPERATION:** The airborne movement of aircraft in controlled and noncontrolled airport terminal areas and about given en route fixes or at other points where counts can be made.
- AIRLINE:** An established system of aerial transportation--especially a commercial system--together with its equipment, holdings, and facilities.
- AIRMAN CERTIFICATE:** A document issued by the Administrator of the Federal Aviation Administration certifying that he has found the holder to comply with the regulations governing the capacity in which the certificate authorizes the holder to act as an airman in connection with aircraft.
- AIRPORT:** An area of land or water that is used or intended to be used for the landing and takeoff of aircraft, and includes its buildings and facilities, if any.
- AIRPORT ADVISORY SERVICE:** A service provided by Flight Service Stations at airports not served by the control tower. This service consists of providing information to landing and departing aircraft concerning wind direction and velocity, favored runway, altimeter setting, pertinent known traffic, pertinent known field conditions, airport taxi routes and traffic patterns, and authorized instrument approach procedures.
- AIR TAXI OPERATOR:** An air carrier coming within the classification of "air taxi operators" established by F.A.R. 298.3.
- BEACON:** Rotating beacon or lighting apparatus used to identify airports during the hours of darkness.

**CERTIFIED ROUTE AIR CARRIER:** One of a class of air carriers holding certificates of public convenience and necessity issued by the Civil Aeronautics Board. These carriers are authorized to perform scheduled air transportation over specified routes and a limited amount of nonscheduled operations.

**CITY PAIRS:** Two cities who are connected by a particular airline through its' route structure.

**COMMUTER AIR CARRIER:** An air taxi operator which (1) performs at least five round trips per week between two or more points and publishes flight schedules which specify the time, days of the week and places between which such flights are performed, or (2) transports mail by air pursuant to a current contract with the Post Office Department.

**DIRECT OPERATING COSTS:** Cost incurred in the direct operation of an aircraft which include crew salaries, fuel, direct maintenance and parts, lubricants, insurance and depreciation.

**DOMESTIC OPERATIONS:** In general, operations within the territory of the United States. These include domestic operations of the certified trunk carriers and the local service, helicopter, intra-Alaska, intra-Hawaii, and domestic all-cargo carriers.

**EMPTY WEIGHT:** The weight of the aircraft, i.e. the structure, powerplants, fixed equipment, fixed ballast, unusable fuel, undrainable oil, and hydraulic fluid.

**ENPLANEMENTS, REVENUE PASSENGER:** The total number of revenue passengers boarding aircraft, including originating, stopover, and transfer passengers.

**FLIGHT ADVISORY SERVICE (FAS):** Advice and information provided by a facility to assist pilots in the safe conduct of flight and aircraft movement.

**FLIGHT PLAN:** Specified information, relating to the intended flight of an aircraft, that is filed orally or in writing with air traffic control.

**FLIGHT SERVICE STATION (FSS):** A central operations facility in the national flight advisory system utilizing data interchange facilities for the collection and dissemination of NOTAMS (Notices to Airmen), weather, and administrative data and providing pre-flight and in-flight advisory service and other services to pilots, via air/ground communication facilities.

**FREIGHT, AIR:** Property other than express and passenger baggage transported by air.

**GROSS WEIGHT:** The empty weight of an aircraft plus the useful load.

**IFR CONDITIONS:** Weather conditions below the minimum prescribed for flight under Visual Flight Rules.

**INDIRECT OPERATING COSTS:** Costs incurred which support the operation of an aircraft which include costs for clerical, management, ground support, and non-flying personnel as well as the facilities required to support them.

**INSTRUMENT APPROACH:** An approach during which the pilot is dependent entirely upon instruments and ground-based electronic and communication systems for course, range, position, altitude, etc.

**INSTRUMENT FLIGHT RULES (IFR):** Federal Aviation Regulations that govern the procedures used in conducting instrument flights.

**INSTRUMENT LANDING SYSTEM (ILS):** An instrument system which provides in the aircraft the proper course, rate of descent (glide slope), altitude, and position necessary to make an approach to a landing.

**LARGE AIRCRAFT:** Aircraft of more than 12,500 pounds, maximum certified takeoff weight.

**LOCAL SERVICE CARRIERS:** Certified domestic route air carriers operating routes of lesser density between the smaller traffic centers and between those centers and principal centers. (North Central Airlines is an example of a local service carrier.)

**NAVIGATIONAL AIR or AIR NAVIGATIONAL FACILITY (NAVAID):** Any facility used in, available for use in, or designed for use in aid of air navigation, including landing areas, lighting, any apparatus or equipment for disseminating weather information, for signaling, for radio direction finding, or for radio or other electronic communication, and any other structure or mechanism having a similar purpose for guiding or controlling flight in the air or the landing or takeoff of aircraft.

**NONSCHEDULED SERVICE:** Revenue flights that are not operated in regular scheduled service, such as charter flights and all non-revenue flights incident to such flights.

**NUMBER OF PLACES:** Minimum crew plus maximum number of passenger seats.

**PASSENGER WEIGHT:** In general, for reporting purposes, a standard weight of 190 pounds per passenger (including free baggage) is used for domestic operations.

**PAYLOAD:** The revenue-producing or useful load that a vehicle of transport (i.e., aircraft) can carry.

**PRECISION APPROACH:** An instrument approach conducted in accordance with established procedures and/or directions issued by a controller which supply the pilot with the heading and/or course and glide slope information necessary for an approach to a landing.

**PRESSURE CABIN:** The portion of an aircraft (usually the personnel and cargo compartments) in which an air pressure greater than the outside atmospheric pressure can be maintained and controlled by artificial means. Such an aircraft is described as being pressurized or having pressurization.

**PUBLICLY-OWNED AIRPORT:** An airport which is owned by a City, State, County, or the Federal Government.

**PUBLIC-USE AIRPORT:** An airport which is open for the use of the general public.

**REVENUE PASSENGER:** A person receiving air transportation for an air carrier for which remuneration is received by the air carrier.

**SHORT HAUL:** An air transportation system providing service on routes from 0 to 200 nautical miles in length.

**SMALL AIRCRAFT:** Aircraft of 12,500 pounds or less, maximum certified takeoff weight.

**STAGE LENGTH:** The air distance between any two airports served by the air carrier.

**SUBSIDY:** A direct pecuniary aid furnished by a government to a private commercial enterprise, i.e. airline subsidy.

**TACTICAL AIR NAVIGATION (TACAN):** A radio transponder facility in the en route electronic navigation system, transmitting a pulse train UHF modulated radio wave, utilized by compatible airborne receiver/interrogator equipment to derive bearing relative to the facility in terms of time delay between interrogation and receipt of reply.

**THIRD LEVEL CARRIER:** See COMMUTER AIR CARRIER.

**TRANSPONDER:** A radio or radar set that upon receiving a designated signal in the form of a series of pulses emits a radio signal of its own that may also be coded.

**TRUNK CARRIERS, DOMESTIC:** This group of carriers operates primarily within the geographic limits of the continental United States over routes serving primarily the larger communities. Most of the domestic trunks also have international and territorial operations.

**TURBOJET:** Aircraft operated by jet engines incorporating a turbine driven air compressor to take in and compress the air for the combustion of fuel, the gasses of combustion (or the heated air) being used both to rotate the turbine and to create a thrust-producing jet.

**TURBOPROP:** Aircraft operated by turbine-propelled engines. The propeller shaft is connected to the turbine wheels, which operate both the compressor and the propeller.

**USEFUL LOAD:** The weight of the flight crew, passengers, baggage and/or cargo, usable fuel and drainable oil for any particular flight.

**VFR CONDITIONS:** Basic weather conditions prescribed for flight under Visual Flight Rules.

**VFR FLIGHT:** Flight conducted in accordance with Visual Flight Rules.

**VOR or VERY HIGH FREQUENCY OMNIRANGE STATION:** A specific type of omnirange operating at VHF and providing radial lines of position in any direction as determined by bearing selection within the receiving equipment.

**NOTE:** This facility emits a nondirectional "reference" modulation and a rotating pattern which develops a "variable" modulation of the same frequency as the reference modulation. Lines of position are determined by comparison of phase of the variable with that of the reference.



## LIST OF ABBREVIATIONS

ATC: Air Traffic Control

CAB: Civil Aeronautics Board

DME: Distance Measuring Equipment

DOT: Department of Transportation

FAA: Federal Aviation Administration, an agency of the Department  
of Transportation

FAR: Federal Aviation Regulation

FBO: Fixed Base Operator

FSS: Flight Service Station

HIRL: High Intensity Runway Lights

IFR: Instrument Flight Rules

ILS: Instrument Landing System

LIRL: Light Intensity Runway Lights

MALS: Medium Intensity Approach Lighting System

MIRL: Medium Intensity Runway Lights

MPH: Miles Per Hour

MSL: Mean Sea Level

NAVAID: Navigational Air or Air Navigational Facility

NDB: Non-directional Radio Beacon

RAIL: Runway Alignment Indicator Lights

REIL: Runway End Identifier Lights

STOL: Short Takeoff and Landing

TACAN: Tactical Air Navigation

TVOR: Terminal VOR

UHF: Ultrahigh Frequency Radio

VASI: Visual Approach Slope Indicator

VFR: Visual Flight Rules

VHF: Very High Frequency Radio

VOR: VHF Omnidirectional Station

VORTAC: Co-located VOR and TACAN