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Technical Report Documentation Page

1. Report No. FAA-AVP-86-1	2. Government Accession No. AD-A090 615	3. Recipient's Catalog No.	
4. Title and Subtitle COMMUTER AIR CARRIER LOAN GUARANTEE STUDY.		5. Report Date Jan 1986	6. Performing Organization Code
7. Author(s) F. William Belina		8. Performing Organization Report No. 79	9. Performing Organization Name and Address The Aerospace Corporation/ 2350 East El Segundo Boulevard El Segundo, California
10. Sponsoring Agency Name and Address Office of Aviation Policy DOT/Federal Aviation Administration 800 Independence Avenue, S.W. Washington, D. C. 20591		11. Work Unit No. (TRAIS)	12. Contract or Grant No. DOT-FA 79 WAI-010
13. Supplementary Notes		14. Type of Report and Period Covered Final Report.	15. Sponsoring Agency Code AVP-210
16. Abstract The Airline Deregulation Act of 1978 made commuter air carriers eligible for Government guaranteed loans for the purchase of aircraft. The Federal Aviation Administration is charged with responsibility for administering the program. As an aid to determining commuter eligibility for guarantees and because publicly available financial data on commuters is very limited, it was necessary to assemble information from a number of sources such as the Civil Aeronautics Board, State Aviation Commissions, and interviews with commuter management and loan offers of financial institutions. Data and information are provided concerning (1) purchase price and operating costs of commuter type aircraft (2) current aircraft acquisition practices, typical loan terms and historical financial performance (3) current credit-worthiness standards established by the financial community and (4) financial viability and ability of commuters to meet those standards.			
17. Key Words commuter airlines, loan guarantee, commuter financial data		18. Distribution Statement Document is available to the public through the National Technical Information Service, Springfield, Virginia	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 77	22. Price

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ACKNOWLEDGMENTS

Appreciation is extended to Regina Van Duzee, the FAA Technical Monitor, for her cooperation and guidance in the conduct of this study. Thanks must also go to Jane St. Mark of SMS Associates of Washington, D.C., whose data gathering activities and excellent knowledge of the commuter industry significantly contributed to the study. Nancy Brewer of the CAB's Office of Community and Congressional Relations was also of great help in providing summary data of historical commuter replacement service statistics. The following Aerospace personnel also extensively contributed to the effort:

- o Barbara Filkins (Data gathering and operating cost analysis)
- o Dr. Ram Mittal (Economic and financial analysis)
- o Dr. Jules Kamin (Financial consultation)

To protect confidentiality, the participating commuter air carriers, manufacturers and financial institutions are not specifically named, but without their excellent cooperation this study would not have been possible.

F. William Belina
Project Manager
The Aerospace Corporation

I. EXECUTIVE SUMMARY

A. BACKGROUND

As a result of the Airline Deregulation Act of 1978, commuter air carriers are now eligible for Federal Aviation Administration (FAA) loan guarantees for the acquisition of aircraft. Unlike the certificated air carriers, which are economically regulated by the Civil Aeronautics Board (CAB), little financial and ownership data are publicly available for the commuters. The FAA's Office of Aviation Policy, in view of a number of commuter air carrier applications for loan guarantees, has thus retained The Aerospace Corporation to assist in the development of a representative financial data base to aid in the evaluation of these applications.

B. WORK PROGRAM

Assisted by SMS Associates of Washington, D.C., Aerospace has: (1) developed current acquisition and operating cost data on new, used, and planned aircraft oriented to the commuter industry; (2) conducted field interviews and reviewed regulatory data for a representative cross section of the commuter industry to identify current aircraft acquisition practices, loan characteristics, and historical financial performance; (3) identified current credit-worthiness standards established by the financial community; and (4) analyzed the economic viability of 30 commuter carriers with respect to these standards. Also addressed were the industry's perception of typical commuter air carrier business failures and the experience of replacement carriers.

C. COMMUTER AIRCRAFT ACQUISITION AND OPERATING COSTS

Using manufacturer's price data and other publications, acquisition costs were identified for 48 new, used, and planned commuter aircraft in eight different passenger capacity categories. Basic 1979 factory price, typical avionics costs, and typical spares costs were combined to develop total investment costs as summarized in Table I. Also included in Table I are summaries of new aircraft direct operating cost (DOC) estimates using a recent commuter cost model developed by Aerospace for Ames Research Center, National

Table I. Commuter Aircraft Acquisition and Operating Cost Data

Aircraft Passenger Capacity Category	(1) Investment Cost Range (\$000)			New Aircraft Direct Operating Costs (2) (\$/Block Hr)
	New A/C	Used A/C	Planned A/C	
4-6	137-203	18-188	-	63- 89
7-10	252-400	66-300	-	79-101
11-15	642	360-480	1,287	113-134
16-19	517-1,600	525-1,200	1,800-1,900	127-206
20-30	2,614	700-1,700	1,900-3,187	214-305
30-40	-	-	3,360-4,150	424-437
40-50	4,800-5,800	750-4,300	3,400-5,000	385-569
50-60	-	-	6,000	Not available

(1) Includes basic factory cost, typical avionics cost, and a 12% spares factor. All figures are 1979 dollars.

(2) Cost range shown for 200 mile average stage length, 3000 hr annual utilization, 15-year straight line depreciation to 15%; and fuel at \$0.64 per U.S. gallon.

Aeronautics and Space Administration (NASA/Ames). (Reference 2). It should be cautioned that the current shortage of commuter aircraft has resulted in a "sellers market." As a result, commuter aircraft prices are escalating at a rapid rate and the costs in Table I should be considered guidelines. This is also true of the DOC's in view of rapidly rising fuel costs.

D. COMMUTER AIRCRAFT ACQUISITION PRACTICES

Financial data for 30 commuter air carriers were obtained and reviewed to evaluate their aircraft acquisition practices. As shown on Table II, these carriers represented a cross section of the industry in regard to fleet size, aircraft size, annual traffic statistics, years in business, and types of ownership. This sample reflected 12-15% of the industry carriers and 15-19% of the industry aircraft in selected characteristics categories.

In order to illustrate representative acquisition practices, this report focuses on the long term debt characteristics of these carriers, the most used sources of debt financing, relative amounts, and typical loan terms for each source. Although long term debt can include some working capital loans, the major portion is incurred in the acquisition of aircraft.

Commercial banks represented the most used source of debt financing with a wide variety of interest rates resulting. Of the 30 carriers for which data was available, 58% of the carriers had one or more loans from commercial banks amounting to a total of slightly over \$31 million. A low of 7% annual interest was noted with a high of prime rate +6. Total loan durations were from 7 to 10 years. Private sources (i.e., stockholder loans, personal loans by investors or company officers) were used by six carriers at annual interest rates from 7-12% with 10-year loan terms. The third most prevalent financing sources was the aircraft manufacturers (including manufacturers' subsidiary finance corporations). Five carriers received financing from these sources at interest rates ranging from 8-1/2 to 11% and loan durations of 2-7 years. Two subsidiary corporations had loans from their parent companies, reflecting 11% of the total long term debt for the 30 carriers. Other sources included convertible debenture issues, utilized by 2% of the carriers, SBA loans (1 percent), and credit union, other commercial finance corporations, etc. (4 percent). Annual interest rates for these latter sources varied from

Table II. Commuter Air Carrier Data Sample (Summary)

Characteristic ⁽¹⁾	Number in Industry		Number Sampled		% Sampled	
	Carriers	Aircraft	Carriers	Aircraft	Carriers	Aircraft
Fleet Size						
Large (>10 aircraft)	40 ⁽³⁾	623	10	154	25	25
Medium (5 - 10 aircraft)	60	470	8	59	13	13
Small (<5 aircraft)	<u>117</u>	<u>331</u>	<u>12</u>	<u>60</u>	<u>10</u>	<u>18</u>
Total	217	1424	30	273	14	19
Aircraft Size						
Large (>19 passengers)	48 ⁽³⁾	187	9	25	19	13
Medium (10 - 19 passengers)	74	376	20	131	27	35
Small (<10 passengers)	<u>157</u>	<u>861</u>	<u>13</u>	<u>53</u>	<u>8</u>	<u>6</u>
Total	279 ⁽⁴⁾	1424	42 ⁽²⁾	209	15	15
Annual Passengers						
Large (>150,000)	21	-	8	-	38	-
Medium (50,000 - 150,000)	31	-	7	-	23	-
Small (<50,000)	<u>165</u>	-	<u>15</u>	-	<u>9</u>	-
Total	217	-	30	-	14	-
Annual Cargo⁽⁵⁾						
Large (>5,000,000 lb)	12	-	3	-	25	-
Medium (500,000 - 5,000,000 lb)	45	-	2	-	4	-
Small (<500,000 lb)	144	-	21	-	15	-
None reported	<u>57</u>	-	<u>4</u>	-	<u>7</u>	-
Total	258	-	30	-	12	-
Annual Mail⁽⁵⁾						
Large (>800,000 lb)	14	-	4	-	29	-
Medium (150,000 - 800,000 lb)	14	-	3	-	21	-
Small (<150,000 lb)	32	-	4	-	13	-
None reported	<u>198</u>	-	<u>19</u>	-	<u>10</u>	-
Total	258	-	30	-	12	-
Years in Commuter Business						
>10	Not	-	12	-	-	-
5 - 10	Avail.	-	12	-	-	-
0 - 5		-	<u>6</u>	-	-	-
Total		-	30	-	-	-
Ownership						
Public Corporation	Not	-	3	-	-	-
Closely Held Corporation	Avail.	-	21	-	-	-
Subsidiary Corporation		-	5	-	-	-
Partnership		-	<u>1</u>	-	-	-
Total		-	30	-	-	-

(1) All data CY 1978

(2) 12 carriers operated more than one size aircraft

(3) Includes two all cargo/mail carriers. Excludes remaining 41 all cargo carriers as fleet size and aircraft type data not readily available.

(4) 62 carriers reported more than one aircraft

(5) Includes 43 all cargo carriers

6-16 percent) with loan durations between 2-15 years. Ten percent, or \$5 million, of the long term debt could not be traced to a specific source in the available data.

E. FINANCIAL COMMUNITY CREDIT STANDARDS

Eleven members of the financial community and two manufacturers were contacted in the course of the study to establish industry credit standards against which commuter air carriers were evaluated. Included were commercial banks, investment banks, insurance companies, venture capital firms, finance corporations, and the two selected aircraft manufacturers known to participate in aircraft financing. Three domestic and four foreign manufacturers were also contacted to assess their requirements for deposits and progress payments. Although each institution contacted stressed the point that credit evaluation is more of an art than a science, all appeared to use six primary factors in evaluating credit worthiness. These factors were management capability, historical performance, selected financial ratios, business projections, quality of collateral, and loan guarantees.

Commercial banks, as short term, cash flow lenders, stressed management capability, a 1-3 year successful "track record," reasonably attractive debt service coverage capabilities, and relatively conservative assumptions in business projections. Quality of collateral (i.e., value retention and salability) is also considered, although it is less important than debt service coverage. Federal loan guarantees were considered attractive, but not necessarily required and could perhaps reduce interest rates 1-2%. Certain financial ratio standards could possibly be further relaxed with a Federal guarantee. Typical loan terms for a reasonable credit worthy commuter would involve annual interest rates from prime +1 to prime +3 1/2 with some banks indicating that prime rate loans are not inconceivable with a Federal guarantee. Although somewhat hesitant to have loan durations exceed 5 or 6 years, more and more banks are regularly financing aircraft for periods of 7-10 years. In some cases, compensating balances (normally 10%) are required with the amount loaned typically 75-80% of the collateral value.

Insurance companies and other long term investors (often participating through the efforts of an investment broker) are traditionally more conservative than the commercial banks. A Federal guarantee is required in

practically every case and quality of collateral is a primary consideration. Less attention is placed on debt service coverage and other traditional financial ratios - primarily because of the Federal guarantee. Typical interest rates on such loans are normally fixed and approximate the rates on treasury bonds or government agency paper. Ten to fifteen years is a typical loan duration. In addition to placements through investment brokers, some insurance companies will participate in a consortia in which a commercial bank will become the lender of record, finance the unguaranteed portion of a loan (often at a higher floating rate of interest) and the insurance company will then purchase the guaranteed portion of the loan.

Due to the insistence of commercial banks and insurance companies on some form of "track record" prior to participating in loans, one of the few, non-private sources of funds open to a starting commuter is a venture capital firm. Such firms will traditionally lend money to higher risk borrowers but will normally insist on equity in the business. However, such firms are not usually interested in a capital intensive business and are looking for a relatively high rate of return over a relatively short time period - not a prevalent feature in the commuter industry. Such firms will insist, depending upon the amount of capital provided, on 40-60% equity ownership. Because many commuters are reluctant to relinquish equity in their corporation, this financial source is not often used.

There are a number of commercial finance corporations actively engaged in financing aircraft. However, they are primarily interested in purchasing aircraft and leasing to operators, although some will provide financing for commuter carrier aircraft acquisition. Both floating and fixed rate loans can be arranged, but floating interest rates are normally 3-5 points over prime or 1-2 points higher than typical commercial bank rates. Fixed rate interest loans can be approximated by relating to corporate bond rates for 8AA credit. Loan durations are typically in the 10-20 year range. One advantage of borrowing from a finance company is that it is the usual practice to allow for level payments in liquidation of the loan. This arrangement can assist a commuter during the early loan term period when he is attempting to establish a market with his newly acquired aircraft.

Although domestic aircraft manufacturers will not normally provide financing to carriers, they will assist in directing carriers to various

institutions who are known to provide such financing, as well as assist in preparing appropriate loan or loan guarantee applications. Additionally, some manufacturers have subsidiary finance corporations which, although principally interested in leasing, will sometimes provide acquisition financing. The normally subsidized foreign aircraft manufacturers, however, will often have arrangements with government owned banks in their respective countries and can often provide very attractive financing through such banks as an incentive to acquire their aircraft. Such terms will vary, but can typically provide up to 85% financing of the aircraft purchase price over a 7-year period at an annual interest rate of 8 1/2%. Deferred payment arrangements are also available.

Aircraft manufacturer requirements for deposits and progress payments were also addressed. These requirements were investigated in view of the limited refinancing provisions of the Loan Guarantee Program which restricts the liquidation of previous short term loans for aircraft deposits to a maximum of 30% of each aircraft's purchase price. Table III summarizes the typical purchase agreement features of seven commuter aircraft manufacturers. As noted on the table, the majority of the manufacturers require an initial deposit of 1-20% with requirements for progress payments varying. Manufacturers of small or "mature" aircraft (i.e., those that have been in production for some time) appear more willing to forego or minimize progress payments during the production cycle. Alternatively, those manufacturers offering the newer, large aircraft are more prone to demand progress payments totalling as much as 60% of the aircraft price by the time of delivery. Due to high costs, cash flow requirements and interest considerations, such manufacturers would be hesitant to arbitrarily reduce progress payment amounts - in particular for the larger commuter aircraft. In the interest of selling their aircraft, however, a few stated a willingness to work with the operator in special cases to try and stay within the 30% limit. Although many of the progress payments are required relatively late in the production cycle (e.g., two or four months before delivery), proper timing of the loan guarantee application and award is definitely indicated to avoid exceeding the 30% deposit limit prior to award if separate short term financing is used for deposits or progress payments.

TABLE III. AIRCRAFT MANUFACTURERS PAYMENT REQUIREMENTS

AGREEMENT ITEM	DOMESTIC MANUFACTURER	DOMESTIC MANUFACTURER	DOMESTIC MANUFACTURER	FOREIGN MANUFACTURER	FOREIGN MANUFACTURER
- AIRCRAFT CAPACITY - YEARS IN PRODUCTION - NUMBER OF AIRCRAFT PURCHASED - TYPICAL PRODUCTION TIME - CONTRACT PRICE & DELIVERY DATE - INITIAL DEPOSIT per aircraft - PROGRESS PAYMENTS per aircraft - FINAL PAYMENT - BUYER DELAYS OR DEFAULT - PROGRESS PAYMENTS - ACCEPTANCE DELAY - CANCELLATION - SELLER DELAYS OR DEFAULT - EXCUSABLE - OTHER	MEDIUM (15-19) 6 6-7 mo ≈ \$1.3M PER AIRCRAFT; 10/78-3/80 4% 6 mo PRIOR TO DELIVERY - 6% 4 mo PRIOR TO DELIVERY - 20% 2 mo PRIOR TO DELIVERY - 20% 50% SELLER'S EXPENSES DELIVERY EXTENSION OR NO PENALTY TERMINATION BREACH OR DEFAULT IF DELIVERY DELAY OVER 90 DAYS	SMALL (1-10) > 10 1 5 mo \$10.2MM PER AIRCRAFT; 1979 15-17% NONE 83-85% SELLER'S NON-RECOVERABLE EXPENSES DELIVERY EXTENSION BUYER NO-PENALTY TERMINATION	MEDIUM (15-19) NEW 1 5 mo \$1.6M PER AIRCRAFT; 1979 (1) 4% (LETTER OF CREDIT) 6 mo PRIOR TO DELIVERY - 2% (1) 3 mo PRIOR TO DELIVERY - 2% (1) 90% SELLER'S NON-RECOVERABLE EXPENSES DELIVERY EXTENSION BUYER NO-PENALTY TERMINATION	MEDIUM (15-19) > 10 1 8 mo \$0.87M; 10/78 10% (non-refundable) 1 mo PRIOR TO DELIVERY - 10% 80% 1-1/2% PER MO INTEREST; SELLER CAN TERMINATE AFTER 15 DAYS SELLER'S NON-RECOVERABLE EXPENSES DELIVERY EXTENSION BUYER NO-PENALTY TERMINATION	MEDIUM (15-19) > 10 1 8 mo \$0.87M; 10/78 10% (non-refundable) 1 mo PRIOR TO DELIVERY - 10% 80% 1-1/2% PER MO INTEREST; SELLER CAN TERMINATE AFTER 15 DAYS SELLER'S NON-RECOVERABLE EXPENSES DELIVERY EXTENSION BUYER NO-PENALTY TERMINATION

(1) Cash conversions of Letter of Credit.

TABLE III. AIRCRAFT MANUFACTURERS PAYMENT REQUIREMENTS (Continued)

AGREEMENT ITEM	FOREIGN MANUFACTURER	FOREIGN MANUFACTURER	FOREIGN MANUFACTURER	FOREIGN MANUFACTURER
- AIRCRAFT CAPACITY - YEARS IN PRODUCTION - NUMBER OF AIRCRAFT PURCHASED - TYPICAL PRODUCTION TIME - CONTRACT PRICE & DELIVERY DATE - INITIAL DEPOSIT (per aircraft) - PROGRESS PAYMENTS (per aircraft)	LARGE (> 10) ≈ 3 2 10 mo ≈ \$4.0M/AIRCRAFT; 7/79 & 12/79 5% 6 mo PRIOR TO DELIVERY - 25% 3 mo PRIOR TO DELIVERY - 25%	LARGE (> 10) 4 2 8 mo ≈ \$1.8M PER AIRCRAFT; 12/78, 6/79 10% 6 mo PRIOR TO DELIVERY - 10%	MEDIUM (15-10) 10 1 8 mo ≈ \$1.3M PER AIRCRAFT; 1979 1% 6 mo PRIOR TO DELIVERY - 15%	LARGE (> 10) > 10 1 14 mo ≈ \$5.5M PER AIRCRAFT; 1979 1% CONTRACT SIGNING OR 14 mo's PRIOR TO DELIVERY (whichever more) - 15% 9 mo PRIOR TO DELIVERY - 15% 6 mo PRIOR TO DELIVERY - 15% 3 mo PRIOR TO DELIVERY - 15% 40% 1-10% PER MO INTEREST SELLER'S NON-RECOVERABLE EXPENSES DELIVERY EXTENSION NO PENALTY BUYER TERMINATION
- FINAL PAYMENT - BUYER DELAYS OR DEFAULT - PROGRESS PAYMENTS - ACCEPTANCE DELAY - CANCELLATION - SELLER DELAYS OR DEFAULT - EXCUSABLE - OTHER	45% 10% PER YEAR; SELLER CAN TERMINATE AFTER 30 DAYS SELLER'S NON-RECOVERABLE EXPENSES DELIVERY EXTENSION NO PENALTY BUYER TERMINATION PLUS 10% PER YEAR INTEREST ON PAID FUNDS	80% ONE-FOR-ONE DELIVERY DELAY + PRIME RATE PLUS 2 INTEREST PENALTY DELIVERY EXTENSION UP TO 6 mo; BUYER MUST PAY SELLER UNRECOVERABLE EXPENSES BUYER TERMINATION PLUS PRIME RATE INTEREST	84% SELLER'S NON-RECOVERABLE EXPENSES (2) DELIVERY EXTENSION NO PENALTY BUYER TERMINATION	

(2) Total 1% deposit refundable under any circumstances. 15% progress payment also totally refundable if financing cannot be arranged by delivery date.

F. COMMUTER AIR CARRIER FINANCIAL VIABILITY

This task assessed (1) financial performance between 1973 and 1979 for the 30 sampled carriers for each year that data was available; (2) factors contributing to commuter air carrier failures; and (3) replacement service history where commuter air carriers have replaced certificated air carriers in the past.

Commuter financial performance was assessed by comparing certain commuter financial ratios with desired standards specified by a number of financial institutions. Although not absolute credit-worthiness indicators, six financial ratios are reviewed by most institutions and are the most readily quantifiable factor for comparison purposes. The six ratios were debt/equity (total liabilities/total equity) or debt ratio (total liabilities/total assets), long term debt/flight equipment assets, debt service coverage (net income/current portion of long term debt plus interest), operating cost ratio (operating expenses/operating revenues) and current ratio (current assets/current liabilities). Table IV summarizes the results of this comparison. It specifies the total number of carriers meeting the financial institution standards (with and without a Federal loan guarantee available) by fleet size category for the years that data points were available. As can be seen, many of the large and medium carriers met the debt/equity or debt ratio and the long term debt/flight equipment assets criteria. Slightly more met the more relaxed standards specified if Federal loan guarantees were available. Fewer of the smaller carriers were able to meet either of these standards. Fewer numbers of medium and small fleet size operators could meet the debt service coverage standards (an important ratio with many commercial banks). However, a relatively higher number of the larger fleet size operators met these standards. In the case of operating cost ratios, many more of the carriers could meet the less stringent standards available with a Federal loan guarantee with only four percent meeting the stricter non-loan guarantee standards. A larger percentage of carriers in all three size categories could meet the current ratio standards.

Table IV. CARRIER DATA POINTS MEETING FINANCIAL RATIO STANDARDS⁽¹⁾

(Selected Years: 1973-1979)

	Debt/Equity or Debt Ratio		LTD/Asset		Debt Service Coverage		Operating Cost Ratio		Current Ratio	
	# Meeting Standard	%	# Meeting Standard	%	# Meeting Standard	%	# Meeting Standard	%	# Meeting Standard	%
o Federally Guaranteed Loan Financial Ratio Standards										
o Large Fleet Size Carriers	18 of 33	55	23 of 33	70	19 of 29	66	11 of 32	34	17 of 33	52
o Medium Fleet Size Carriers	14 of 18	78	14 of 15	93	6 of 11	55	3 of 13	23	11 of 17	65
o Small Fleet Size Carriers	10 of 30	33	17 of 29	59	2 of 24	8	11 of 28	39	15 of 30	50
Total	42 of 81	52	54 of 77	70	27 of 64	42	25 of 73	34	43 of 80	54
o Non-Federally Guaranteed Loan Financial Ratio Standards										
o Large Fleet Size Carriers	17 of 33	52	21 of 33	64	18 of 29	62	1 of 32	3	17 of 33	52
o Medium Fleet Size Carriers	11 of 18	61	13 of 15	87	6 of 11	55	1 of 13	8	11 of 17	65
o Small Fleet Size Carriers	8 of 30	27	11 of 29	38	1 of 24	4	1 of 28	4	15 of 30	50
Total	36 of 81	44	45 of 77	58	25 of 64	39	3 of 74	4	43 of 80	54

(1) Data points obtained for 30 carriers for varied numbers of years between 1973-1979.

Factors contributing to commuter airline failures were investigated by reviewing available literature as well as discussing these factors with the carriers. Those interviewed said the biggest problem was under-capitalization in this capital-intensive industry. And next was the lack of good business sense by management resulting in less than prudent decisions regarding new aircraft acquisition, expansion, and debt management. Other factors identified included lack of sufficient market analysis, failure to use proper size aircraft, inability to grow (often through lack of capital), and the ever present problem of competition where a carrier enters a market that has been established by another carrier with the mistaken belief that the market can support them both.

In regard to replacement service history, a number of commuter air carriers have replaced certificated air carriers in CAB suspended and deleted markets. Available traffic data showed very good market response for commuters in suspended markets. Practically all suspended markets with commuters operating smaller aircraft on more frequent schedules, showed significant traffic growth when compared to prior certificated air carrier enplanements. In 47 suspension markets for which data was available, the average annual rate of growth in enplanements was 19.5% with only 10 of the 47 markets enplaning fewer passengers than the replaced certificated carriers. The majority of service was provided with little or no financial underwriting. Replacement service in deleted markets resulted in less impressive growth rates but many are currently being successfully served by commuter operators and have shown definite increases when compared to certificated air carrier traffic. The available data showed that 30 of the 71 points deleted since 1967 were being successfully served by commuters in 1977. Ten of these showed fairly significant increases in traffic when compared with prior certificated service.

II. INTRODUCTION AND BACKGROUND

In October of 1978, Congress enacted Public Law 95-504, entitled the Airline Deregulation Act of 1978, which included an extension of the aircraft loan guarantee program. Benefits of this program are now extended to (1) any air carrier whose certificate (a) authorizes such air carrier to provide local or feeder air service, (b) authorizes scheduled passenger operations, the major portion of which are conducted within the State of Hawaii, (c) authorizes operations (the major portion of which are conducted either within Alaska or between Alaska and the 48 contiguous States), within the State of Alaska (including service between Alaska and the forty-eight contiguous States, and between Alaska and adjacent Canadian territory), or (d) authorizes metropolitan helicopter service; (2) any charter air carrier for the purpose of purchasing any all-cargo nonconvertible aircraft; (3) any commuter air carrier; or (4) any intrastate air carrier.

Although the Act authorizes the guarantee of aircraft acquisition loans up to \$100 million per carrier, a budget ceiling of \$100 million was established for FY-1979, \$50 million of which was earmarked for commuter carriers for the purchase of passenger aircraft with a maximum capacity of 60 passengers or cargo aircraft with a capacity of less than 18,000 pounds. Budget ceilings for FY-1980 are \$650 million of which \$150 million is projected for commuters.

A guarantee may not exceed 90 percent of the face value of the loan and 100 percent of unpaid interest. The loan itself may not exceed 90 percent of the purchase price of the aircraft including spare parts and engines. The loan term may not be longer than 15 years, but may be shorter depending on the type of aircraft being purchased.

Considerable attention regarding this loan guarantee program has been focused on commuter air carriers due to their significant role in providing essential air service to the Nation's smaller communities. This important segment of the industry also consists of smaller carriers normally less able than the established certificated carriers to qualify for financing under conventional financial institution credit standards. A guarantee may be made only if the FAA finds that (1) the air carrier would not otherwise be able to obtain funds for the purchase of aircraft on reasonable terms; (2) the aircraft to be purchased are needed to improve the service and efficiency of

the air carrier; (3) there is reasonable assurance of the carrier's ability to repay the loan; and (4) the value of the security pledged furnishes reasonable protection to the United States.

Unlike the certificated air carriers, commuters operating under a Part 298 exemption have not historically been required to report economic data to the CAB. The FAA is thus in a position of having a number of commuter air carriers applying for loan guarantees with little industry historical or background data available for proper evaluation in the granting of such guarantees. Accordingly, the FAA's Office of Aviation Policy has contracted with The Aerospace Corporation to assist them in the development of a representative industry financial data base that will facilitate loan guarantee application evaluations.

A four task program was defined. These tasks addressed the development of basic data identifying current commuter aircraft purchase prices and operating costs; current commuter industry practices in purchasing flight equipment; financial institution criteria and standards for evaluating commuter aircraft credit-worthiness, including typical loan conditions and terms; and finally, the historical economic viability of a representative cross section of commuter air carriers. In order to carry out the above tasks, it was necessary to consider addressing typical causes of failure within the industry and the experience of carriers providing replacement service. This report summarizes the study approach used to accomplish the above activities (Section III) and identifies the study results emanating that approach (Section IV).

III. STUDY TASKS AND APPROACH

A. TASK 1. COMMUTER AIRCRAFT ACQUISITION AND OPERATING COSTS

This task addressed the identification of current purchase prices and direct operating costs of aircraft currently utilized or projected for utilization by the commuter air carrier industry.

1. ACQUISITION COSTS

Initially, three categories of costs were identified to describe the total investment facing a commuter purchasing a new or used aircraft. These were: basic aircraft factory cost, typical avionics equipment cost, and spares cost. Basic factory costs were obtained from published literature or through conversations directly with the aircraft manufacturers. Avionics costs were more difficult to estimate as the amount and quality of avionics equipment will vary considerably from operator to operator, usually as a direct function of aircraft size. The larger aircraft tend to be better equipped in terms of avionics capabilities, redundancy, and quality.

Thus, to relatively standardize avionics costs, the "Aircraft Blue Book" (Reference 1) was used. This document summarizes equipped costs of both new and used aircraft considering three different levels of avionics capabilities as a function of size. The lighter twin piston commuter aircraft (Piper Aztec, Cessna 310, etc.) were assumed to have essentially a full IFR panel with autopilot but limited dual redundancy. The heavier twin piston aircraft (Piper, Navajo, Cessna 402, etc.) were assumed to have reasonably full dual panels including a flight director, weather radar, radar altimeter, air conditioning, etc. The larger turboprop aircraft were assumed to be equipped similarly to the heavy twin piston aircraft plus anti-ice, R-NAV, and full dual panels for both pilot and copilot. The equipped Blue Book prices were then compared with basic aircraft factory prices and the difference attributed to avionics.

The validity of this difference was cross checked by comparing the low, average and high costs of the individual avionic items which were obtained from industry price lists, with a number of specific aircraft whose equipped costs were obtainable. Good correlation was noted. Using this approach it

was possible to determine typical percentages of basic aircraft price attributable to avionics systems as a function of aircraft size. These percentages were then used throughout including planned new aircraft for which limited projected price data were available.

In the case of airframe and engine spares, a number of data points were obtained through conversations with the manufacturers. Although the amount of spares actually purchased can vary considerably depending on such factors as fleet size, number of aircraft purchased, type of operation, etc., a consensus of 10-15% of the basic aircraft price for spares emerged (less a complete spare engine). Although a spare engine was not assumed in tabulating the total acquisition costs (many one- or two-aircraft purchasers will not include one), the typical price of a single engine of the type used on commuter aircraft is about 10% of the basic aircraft price.

Price data were not available for a few of the larger, planned aircraft. In such cases \$100,000 per passenger seat was assumed for the total acquisition costs. Although current costs per seat of the larger aircraft vary between \$70-\$90,000 per seat, avionics and spares considerations should result in the \$100,000 per seat assumption being reasonable.

2. DIRECT OPERATING COSTS

In order to estimate the direct operating costs (DOC's) for the commuter aircraft, a recently developed Aerospace Corporation model was used (Reference 2). This model was developed for NASA/Ames to estimate direct operating costs of 15-60 passenger aircraft in commuter service using independent variables that were sensitive to technology (i.e., fuel consumption, weight, cruise speed, etc.). It was developed and calibrated using actual data obtained from interviewing 21 commuter air carriers which operate a cross section of all aircraft in these size categories. When tested statistically, the model proved to be a very good tool for estimating DOC's. The commuter model equations are shown in Table V and result in \$/block hour estimates. This approach made it possible to estimate direct operating costs based upon projected physical and performance parameters of a number of aircraft not yet in production. It further enabled the ready estimation of costs as a function of stage length which permits more direct correlation to specific carrier operational characteristics.

TABLE V. COMMUTER DOC MODEL

FLIGHT CREW	$FCC = (1.776) \left(\frac{\text{EMPTY WGT}}{1000} \right) + (21.79) \left(\frac{\text{ENGINE PWR}}{1000} \right) - (17.0) \left(\frac{\text{BLOCK SPEED}}{100} \right) + 21.79$
FUEL, OIL, TAXES	$FOT = (0.311) \left(\frac{\text{GAL PER HR}}{\text{HR}} \right) + (84.83) \left(\frac{\text{FUEL COST}}{\text{COST}} \right) + (0.97) \left(\frac{\text{EMPTY WGT}}{1000} \right) - 31.51$
MULL INSURANCE	$IHU = \frac{(\text{INS RATE}) \left(\frac{\text{A/C COST}}{\text{COST}} \right)}{\text{ANNUAL BLOCK UTILIZATION}}$
TOTAL AIRFRAME MAINTENANCE	$\text{MANAFT} = (0.0164) \left(\frac{\text{EMPTY WGT}}{\text{WGT}} \right) - (0.111) \left(\frac{\text{AVG STAGE}}{\text{LENGTH}} \right) + 16.895$
AIRFRAME LABOR	$\text{MANAFL} = \text{MANAFT} (0.5)$
AIRFRAME PARTS	$\text{MANAFP} = \text{MANAFT} (0.5)$
TOTAL ENGINE MAINTENANCE	$\text{MANEGT} = (0.420) \left(\frac{\text{EMPTY WGT}}{\text{WGT}} + \frac{\text{ENG PWR}}{100} \right) - 6.16$
ENGINE LABOR	$\text{MANEGL} = \text{MANEGT} (0.5)$
ENGINE PARTS	$\text{MANEGP} = \text{MANEGT} (0.5)$
MAINTENANCE BURDEN	$\text{MBUR} = (0.152) (\text{MANAFT} + \text{MANEGT}) + 4.98$
DEPRECIATION	$\text{DEPTO} = \frac{(\text{SPARES FACTOR}) (1 - \text{RESIDUAL VALUE}) \left(\frac{\text{A/C COST}}{\text{COST}} \right)}{(\text{DEPR PERIOD}) (\text{ANNUAL BLOCK UTL.})}$

VARIABLES

DOC ELEMENT

FCC	FLIGHT CREW COST
FOT	FUEL, OIL, TAXES
IHU	MULL INSURANCE
MANAFT	TOTAL AIRCRAFT MAINTENANCE
MANAFP	AIRFRAME-MAINTENANCE-PARTS
MANAFL	AIRFRAME-MAINTENANCE-LABOR
MANEGL	ENGINE MAINTENANCE-LABOR
MANEGP	ENGINE MAINTENANCE-PARTS
MBUR	DIRECT MAINTENANCE BURDEN
MTOTAL	TOTAL DIRECT MAINTENANCE
DEPTO	TOTAL DEPRECIATION
DOCTO	TOTAL DIRECT OPERATING COST

B. TASK 2. COMMUTER AIR CARRIER AIRCRAFT ACQUISITION PRACTICES

This task involved gaining insight into current aircraft acquisition practices used by commuter air carriers. The approach to accomplishing this effort involved interviews with carrier management and/or regulatory docket reviews pertaining to the 30 commuter air carriers identified on Table VI. Table VI also includes certain characteristics associated with each carrier. The carriers are not named nor are certain features (e.g., geographic location) specifically identified in order to protect confidentiality of the data. These carriers were selected as representing a relatively good cross section of the entire industry. Attempts were made to contact large, medium, and small operators from the standpoint of passengers and cargo carried, fleet size and type of aircraft operated, different types of ownership, etc.

Selected were 10 carriers with large fleet sizes (over 10 aircraft); 8 carriers with medium fleet sizes (5 to 10 aircraft); and 12 carriers with small fleet sizes (less than 5 aircraft). The sample further includes 9 carriers operating large aircraft (over 19 passengers), 20 carriers operating medium size aircraft (10 to 19 passengers) and 13 carriers with small aircraft (less than 10 passengers). Passenger, cargo, and mail statistics are also reflected with what is considered to be a suitable cross section of large, medium and small carriers including two all cargo carriers. The sample further represents a geographic cross section with carriers shown including samples from the Northwest, Western, Southwest, Middle West, Northeast, Middle Atlantic and Southern regions of the United States. Data were also obtained for four carriers who have gone out of business due to financial problems in order to assess their financial characteristics. Table VII identifies the topics discussed with the interviewed carriers that related to aircraft financing practices.

TABLE VI. COMPUTER AIR CARRIER DATA SAMPLES

CARRIER	FLEET SIZE ⁽¹⁾	AIRCRAFT SIZE ⁽²⁾	ANNUAL PASS ⁽³⁾	ANNUAL CARGO ⁽⁴⁾	ANNUAL MAIL ⁽⁵⁾	YRS IN COMM BUSINESS	OWNERSHIP ⁽⁶⁾
A	L	S, M	S	S	-	5	PC
B	L	M, L	L	L	S	>10	PC
C	L	M, L	L	S	-	>10	CHC
D	L	M	L	S	-	>10	CHC
E	L	M, L	L	S	M	>10	SC
F	L	M, L	M	S	-	6	CHC
G	L	M	L	S	S	9	PC
H	L	S, L	S	L	L	>10	CHC
I	L	M, L	S	L	-	>10	CHC
J	L	S	M	S	-	≈5	CHC
K	M	S, M	S	M	L	4	CHC
L	M	S	S	S	-	>10	CHC
M	M	L	M	S	-	8	CHC
N	M	S	S	S	-	6	CHC
O	M	M, L	L	S	-	>10	CHC
AC	M	M	M	M	-	>7	CHC
AE	M	M	M	S	M	>10	CHC
AH	M	M	L	S	L	>10	CHC
P	S	M	S	-	-	>10	SC
Q ⁽⁷⁾	S	S	S	-	-	≈3	P
R	S	S, M	S	S	-	4	CHC
S	S	M	S	-	-	3	SC
T	S	S, M	S	S	L	8	CHC
V	S	S	S	S	-	9	CHC
W ⁽⁷⁾	S	S	S	S	M	>7	CHC
X	S	M	M	S	S	>5	CHC
Y	S	M	M	S	-	8	CHC
Z ⁽⁷⁾	S	S	S	-	-	≈5	CHC
AB	S	S	S	S	-	3	SC
AD	S	M, L	L	S	S	>10	SC
TOTALS	L - 10 M - 8 S - 12	L - 9 M - 20 S - 13	L - 8 M - 7 S - 15	L - 3 M - 2 S - 21 NONE - 4	L - 4 M - 3 S - 4 NONE - 19	>10 - 12 5-10 - 12 0-5 - 6	PC - 3 CHC - 21 SC - 5 P - 1

NOTES:

- (1) L-Large (>10 A/C); M-Medium (5-10 A/C); S-Small (<5 A/C)
- (2) L-Large (>19 pass); M-Medium (10-19 pass); S-Small (<10 pass)
- (3) L-Large (>150,000); M-Medium (50,000 - 150,000); S-Small (<50,000)
- (4) L-Large (>5 million lb); M-Medium (500,000 - 5 million lb); S-Small (<500,000 lb)
- (5) L-Large (>800,000 lb); M-Medium (150,000 - 800,000 lb); S-Small (<150,000 lb)
- (6) PC-Public Corp.; CHC-Closely Held Corp.; SC-Subsidiary Corp.; P-Partnership
- (7) Currently out of business

Table VII. COMMUTER AIR CARRIER FINANCING DISCUSSION TOPICS

- o Capital Sources
 - o Private Investors
 - o Commercial Bank
 - o Insurance Co.
 - o Investment Bank
 - o Venture Capital Firm
 - o Small Business Investment Co.
 - o Finance Company
 - o Equity Issue
- o Current Flight Equipment Loans
 - o Amount
 - o Lender(s)
- o Guarantor(s)
 - FAA
 - FMHA
 - SBA
 - Other Federal
 - Personal
 - Third Party

Non-guaranteed portion

- o Amount
- o Term of Loan
- o Annual Interest Rate
- o Compensating Balance
- o Collateral
- o Amount and Terms of Repayment

Guaranteed Portion

- o Amount
- o Term of Loan
- o Annual Interest Rate
- o Compensating Balance
- o Collateral
- o Amount & Terms of Repayment

C. TASK 3. FINANCIAL INDUSTRY STANDARDS

This task addressed the identification of criteria and standards used by the various financial institutions in evaluating the credit-worthiness of commuter air carriers. Eleven financial institutions and two manufacturers were contacted to obtain their credit standards and their views and experiences on methods used by commuters for the acquisition of aircraft. Typical loan terms, conditions, and repayment histories were also discussed. The financial institutions contacted included commercial banks, insurance companies, investment banks, venture capital forms, and finance corporations.

Quantitative and qualitative factors used by such institutions to establish credit-worthiness were addressed and attempts made to differentiate the factors for availability of both Federal and non-Federal loan guarantees. Table VIII identifies the primary elements discussed during these interviews. These discussions were held to try and provide an industry baseline as to their standards. This baseline can be used to establish a deviation policy for evaluating loan guarantees to applying carriers who may not be able to meet these credit-worthiness standards.

D. TASK 4. COMMUTER AIR CARRIER FINANCIAL VIABILITY

This task involved the assessment of the economic viability of a representative cross section of the commuter air carrier industry. During interviews with carrier management, a discussion list was used that addressed the carrier characteristics and economic performance for the last five years. Table IX summarizes the subjects discussed. This effort included obtaining copies, where possible, of income statements, balance sheets, and statements of changes in financial position for a five-year period.

Additionally, a number of commuter carriers have either applied for, or have been granted, Certificates of Public Convenience & Necessity by the CAB in the past year or so. The CAB docket and Form 41 data were reviewed and copies of related financial statements obtained for a historical period. Some financial data were also available as a result of dormant authority applications, Essential Air Service investigations, and other CAB investigations for some of the commuter air carriers. These data were

TABLE VIII. FINANCIAL INSTITUTION DISCUSSION TOPICS

- o Credit-worthiness Criteria and Standards
 - o Management Capability
 - o "Track Record" Standards
 - o Current Financial Status Standards (including ratios)
 - o Debt Service Coverage
 - o Fixed Charge Coverage
 - o Debt Ratio
 - o Operating Cost Ratio
 - o LTD/Asset Ratio
 - o Current Ratio
 - o Debt/Equity
 - o Others
 - o Financial Projections
- o Typical Aircraft Acquisition Loan Characteristics
 - o Guaranteed vs non-guaranteed loans
 - o Typical loan terms
 - o Floating Rate vs fixed rate
 - o Typical covenants
 - o Collateral requirements
 - o Terms & history of repayment
 - o Compensating balance requirements
 - o Minimum loan amounts

TABLE IX. COMMUTER AIR CARRIER ECONOMIC VIABILITY DISCUSSION TOPICS

- o Company structure & ownership
 - o Partnership and Type
 - o Corporation and Type
- o Total Nature of Business Activities
 - o Commuter Airline
 - o Fixed Base Operator
 - o Air Taxi
 - o Aircraft Maintenance
 - o Aircraft Sales
- o Current Aircraft, Fleet Size, & Aircraft on Order
- o Financial Statements
 - o Profit & Loss Statement
 - o Balance Sheet
 - o Financial Position Change Statement
- o General Topics
 - o Reasons for Commuter Airline Business Failures
 - o Methods Used to Project Patronage & Fares

supplemented by financial and ownership data obtained from selected State Aeronautics Commissions where state regulation has been applicable in the past. Selected states require the filing of certain financial data on an annual basis and as part of fare or route proceedings.

Because of the sensitivity of financial data, in spite of the promises of confidentiality, a number of carriers initially contacted were unwilling to provide detailed information. This was particularly true of a number of the smaller commuters that are privately owned or closely held businesses. Through the above mentioned interview and data acquisition activities, however, and the data obtained from the financial institutions, it was possible to make comparisons of the financial history of those carriers willing to cooperate with financial institution credit-worthiness criteria and standards.

In addition to the above, the topics discussed with commuters included the carriers' perceptions of reasons for business failure in the commuter industry. Finally, the experiences of replacement carriers were also addressed by reviewing summary data from the CAB. These data illustrated the patronage differences throughout the country where commuters, with smaller aircraft and more frequent service, replaced certificated air carriers.

IV. STUDY RESULTS

Section III summarizes the basic study approach used to accomplish the objectives of each of the four study tasks. Summarized in this section are the results of these activities which are discussed on a task by task basis.

A. TASK 1. COMMUTER AIRCRAFT ACQUISITION AND OPERATING COSTS

1. ACQUISITION COSTS

Using the approach and documentation identified in Section III, aircraft acquisition costs for new aircraft that were still in production (or planned) as well as used aircraft in three different age groups (where available) were identified as summarized on Table X. This table identifies purchase price and direct operating cost data for eight different aircraft passenger capacity categories and 48 aircraft types currently in use by commuter or planned for commuter utilization. The table includes the number of aircraft utilized in the 1978 U.S. commuter fleet, and 1979 new aircraft prices for aircraft still in production, which include a basic factory price, typical avionic and equipment prices, initial spares costs, and the sum of these three elements representing total investment cost.

Table XI shows the assumed avionic and equipment cost data as a function of four aircraft passenger capacity categories. Using separately obtained equipment costs from the aircraft Blue Book and basic factory costs obtained from other sources, a normalized percentage of basic aircraft cost was established for each of these four capacity categories. They were 25% in the 4-6 and 7-10 passenger categories, 15% in the 10-30 passenger categories and 8% in the 30-60 passenger categories. These percentages were further validated based on the individual avionic equipment costs shown in Table XII that were obtained from other avionic price sources and applied to a selected number of aircraft in each category.

Referring to Table X, used aircraft price in three age categories were also obtained from the aircraft Blue Book or through conversations with manufacturers or dealers conversant with used equipment prices. The Blue Book

TABLE X. COMMUTER AIRCRAFT COST DATA

PASSENGER CAPACITY	AIRCRAFT	No. IN 1978 U.S. FLEET	1979 NEW AIRCRAFT PRICE (\$000)					USED AIRCRAFT (\$000) (1)			TOTAL DIRECT OPERATING COST (\$/Block Hr.) (10)		
			BASIC FACTORY PRICE	TYPICAL AVIONICS EQUIPMENT PRICE (1)	INITIAL SPARES COST (2)	TOTAL INVESTMENT COST	1 - 2 YRS OLD	3 - 5 YRS OLD	> 5 YRS OLD	ASL (15) 100	ASL 200	ASL 300	
4 - 6	PIPER AZTEC (Turbo)	55	140 ⁽⁶⁾	37	18	203	113 - 139 ⁽⁵⁾	80 - 99 ⁽⁵⁾	41 - 72 ⁽⁵⁾	83	71	58	
	AERO COMMANDER 500	17	-	-	-	-	-	-	33 - 70 ⁽⁵⁾	102	89	76	
	560		-	-	-	-	-	23 - 48 ⁽⁵⁾	99	86	74		
	AERO COMMANDER 680	19	-	-	-	-	-	-	32 - 74 ⁽⁵⁾	108	95	82	
	CESSNA 310	23	133 ⁽⁶⁾	33	16	182	188 - 140 ⁽⁵⁾	70 - 102 ⁽⁵⁾	18 - 65 ⁽⁵⁾	87	74	61	
7 - 10	PIPER SENeca	29	100 ⁽⁶⁾	25	12	137	90 - 100 ⁽⁵⁾	44 - 75 ⁽⁵⁾	36 - 40 ⁽⁵⁾	76	63	50	
	PIPER NAVAJ0	130	208 ⁽⁶⁾	52	25	285	192 - 218 ⁽⁵⁾	148 - 168 ⁽⁵⁾	88 - 140 ⁽⁵⁾	95	88	69	
	PIPER NAVAJ0 (Chiefman)		239 ⁽⁶⁾	60	29	328	225 - 248 ⁽⁵⁾	160 - 190 ⁽⁵⁾	152 ⁽⁵⁾	99	86	75	
	CESSNA 402	116	213 ⁽⁶⁾	53	26	292	185 - 210 ⁽⁵⁾	120 - 150 ⁽⁵⁾	66 - 130 ⁽⁵⁾	92	79	66	
	CESSNA 404		293 ⁽⁶⁾	73	35	401	260 - 300 ⁽⁵⁾	-	-	114	101	88	
11 - 15	BRITTEN-NORMAN ISLANDER	34	184 ⁽¹⁷⁾	46	22	252	-	-	-	93	81	68	
	GAF NOMAD N22B	0	505 ⁽¹¹⁾	76	51	642	-	-	-	126	113	101	
	BEECH 99	95	-	-	-	-	-	-	340 - 480 ⁽⁷⁾	147	134	121	
	BEECH C99 (New)	0	1,015 ⁽³⁾	150 ⁽⁷⁾	122	1,287	-	-	-	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE	
	BEECH 1300 (New)	0	1,015 ⁽³⁾	150 ⁽⁷⁾	122	1,287	-	-	-	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE	
16 - 19	HP JETSTREAM 200	8	-	-	-	-	-	-	550 ⁽⁴⁾	180	167	155	
	HP JETSTREAM 31 (New)	0	NOT AVAILABLE	-	-	1,900 ⁽¹⁹⁾	-	-	-	199	186	173	
	SWEARINGEN METRO	35	1,195 ⁽⁷⁾	179	143	1,517	1,200 ⁽¹²⁾	1,000 ⁽¹²⁾	900 ⁽¹²⁾	191	178	165	
	DH-114 HERON	14	-	-	-	-	-	-	150 ⁽⁸⁾	180	167	155	
	EMB-110 BANDEIRANTE	0	1,000 - 1,300 ⁽⁴⁾	170	138	1,308 - 1,608	-	-	-	197	184	172	
	DHC-6 SERIES 100	85	-	-	-	-	-	-	525 ⁽¹²⁾	140	127	114	
	DHC-6 SERIES 200		-	-	-	-	-	550 ⁽¹²⁾	142	130	117		
	DHC-6 SERIES 300		868 ⁽¹²⁾	130	104	1,102 ⁽¹⁴⁾	945 ⁽¹²⁾	850 ⁽¹²⁾	700 ⁽¹²⁾	172	159	146	
	CASA C-212 (Series 200)	0	NOT AVAILABLE	-	-	1,000 ⁽¹⁴⁾	NOT AVAILABLE	-	-	168	155	142	
	GAF NOMAD N24A	0	690 ⁽¹⁷⁾	103	83	876	-	-	-	147	135	122	
	BEECH 1900 (New)	0	1,450 ⁽³⁾	220	174	1,844	-	-	-	218	206	193	
	IAI-201 ARAVA	0	1,100 ⁽¹⁴⁾	165	132	1,397	-	-	-	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE	
	DORNIER LTA (New) - PRESS	0	NOT AVAILABLE	-	-	1,900 ⁽¹⁹⁾	-	-	-	208	195	182	
	BRITTEN-NORMAN TRISLANDER	0	407 ⁽¹⁷⁾	61	49	517	-	-	-	156	143	130	

TABLE X. COMPUTER AIRCRAFT COST DATA (Continued)

PASSENGER CAPACITY	AIRCRAFT	No. in U.S. Fleet	1979 NEW AIRCRAFT PRICE \$0000				USED AIRCRAFT \$0000 (1)			TOTAL DIRECT OPERATING COST \$/Block Hr (18)		
			BASIC FACTORY PRICE	TYPICAL AVIONICS EQUIPMENT PRICE (1)	INITIAL SPARES COST (2)	TOTAL INVESTMENT COST	1 - 2 YRS OLD	3 - 5 YRS OLD	> 5 YRS OLD	ASL 100 (15)	ASL 200	ASL 300
20 - 30	MD80-202	18	-	-	-	-	-	-	700 ⁽¹⁸⁾	282	269	256
	S-30	3	2,000 ⁽¹²⁾	300	247	2,644	1,700 ⁽¹²⁾	-	-	315	302	289
	BOEING 737-300 - PRESS	0	NOT AVAILABLE	-	-	2,400 ⁽¹¹⁹⁾	-	-	-	227	214	201
	AMRENS AR-402 (4000)	0	1,500 ⁽¹²⁾	225	100	1,825	-	-	-	248	236	223
	AMRENS AR-404 (4000)	0	1,700 ⁽¹²⁾	275	204	2,159	-	-	-	242	229	216
30 - 40	EMB-120 (4000)	0	2,500 ⁽¹⁴⁾	375	312	3,187	-	-	-	318	305	292
	DE HAVILLAND DASH 8 (4000)	0	2,800 ⁽¹³⁾	224	336	3,360	-	-	-	448	435	423
	SHORTS (4000)	0	NOT AVAILABLE	-	-	3,500 ⁽¹¹⁹⁾	-	-	-	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE
	AEROSPATIALE AS350 (4000)	0	NOT AVAILABLE	-	-	3,500 ⁽¹¹⁹⁾	-	-	-	437	424	412
	GULFSTREAM AMERICAN (4000)	0	3,000 - 3,500 ⁽¹³⁾	260	340	3,650 - 4,150	-	-	-	650	637	624
40 - 50	DHC-7-100	1	4,000	320	404	4,834	4,300 ⁽¹²⁾	-	-	481	468	455
	DHC-7-200 (4000)	0	NOT AVAILABLE	-	-	5,000 ⁽¹¹⁹⁾	-	-	-	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE
	F-27 140 - 40 Passengers	0	4,500 ⁽¹⁰⁾	340	540	5,400	-	-	1,000 ⁽¹²⁾	402	389	377
	FH-227F-27 (AIRCCHILD)	8	-	-	-	-	-	-	800 ⁽¹²⁾	467/397	454/385	442/372
	HS-746	1	4,800 ⁽¹⁰⁾	300	576	5,756	-	-	-	581	569	556
50 - 60	CV-580	1	-	-	-	-	-	-	1,000 ⁽¹²⁾	537	524	511
	CV-600	0	-	-	-	-	-	-	750 ⁽¹²⁾	495	483	470
	CAC - 100 (4000)	0	2,860 ⁽¹⁹⁾	230	343	3,433	-	-	-	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE
	DHC-7L-300 (4000)	0	NOT AVAILABLE	-	-	6,000 ⁽¹¹⁹⁾	-	-	-	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE
		0										

(1) See Table 24.8 for typical avionics/equipment and price sources

(2) 12% of basic factory price presumed based on manufacturer's consensus of 10-15%. Spare engine not included which is typically 10% of basic factory price

(3) Aviation Week and Space Technology, 5/14/79

(4) Aviation Week and Space Technology, 10/16/78

(5) Aircraft Blue Book, 2nd Quarter, 1979

(6) Aviation Week and Space Technology, 3/12/79

(7) Business and Commercial Aviation, 2/78. Early equipped 1978 prices inflated 20% and assumed avionics costs per Table VIII deducted

(8) Operator Interview, 5/79

(9) Aviation Week and Space Technology, 7/30/79. Late 1978 price inflated 10%

(10) Aviation Week and Space Technology, 5/79

(11) General Aviation News, 8/13/79

(12) Aviation Week and Space Technology, 9/79

(13) 70% of DHC-7 per telecon with manufacturer, 9/79

(14) Telecon with computer operator, 9/79

(15) Average stage length in statute miles

(16) Business Aviation, 10/8/69

(17) Manufacturers' 6/79 price lists

(18) All DOC's based on new aircraft prices for aircraft still in production. Average used aircraft price used for aircraft no longer in production

(19) Assumed at \$100,000 per seat

TABLE XI. AVIONICS AND EQUIPMENT ASSUMPTIONS

<u>Passenger Capacity</u>	<u>Assumed Avionics & Equipment</u>	<u>Average % of Basic Aircraft Cost (1)</u>	<u>Typical Avionics/ Equipment Cost (\$000)</u>
4-6	DUAL TRANCEIVERS & VOR'S, GLIDE SLOPE, MARKER BEACON, ADF, TRANSPONDER, DME, ENCODING ALTIMETER, 3-AXIS AUTOPILOT WITH COUPLERS	25%	20-40
7-10	SAME AS 4-6 PASSENGER AIRCRAFT PLUS FLIGHT DIRECTOR, DE-ICE, RADAR ALTIMETER, WEATHER RADAR, AIR CONDITIONING	25%	50-100
10-30	DUAL PANELS FOR PILOT AND COPILOT INCLUDING TRANSCIVERS, VOR'S, GLIDE SLOPES, MARKET BEACONS, ADF'S, TRANSPONDERS, DME'S AND ENCODING ALTIMETERS. ALSO INCLUDES RADAR ALTIMETER, 3-AXIS AUTOPILOT WITH COUPLERS, FLIGHT DIRECTOR, R-NAV, FULL ANTI-ICE, WEATHER RADAR AND AIR CONDITIONING.	15%	150-300
30-60	SAME AS 10-30 PASSENGER AIRCRAFT	8%(2)	200-400

(1) Equipped cost per "Aircraft Blue Book" - 2nd Quarter 1979";
Basic factory costs per "Aviation Week & Space Technology"

(2) Estimate based on typical avionics cost for 10-30 passenger aircraft

TABLE XII. AVIONICS EQUIPMENT ITEMS COST PER UNIT (\$)

Item	Low	Average	High	Quantity
o Transceiver (200/720)	1,200	2,800	7,200	2
o VOR	300	2,500	11,000	2 ⁽³⁾
o Glide Slope	700	800	1,300	2 ⁽³⁾
o Market Beacon	150	300	600	2 ⁽³⁾
o ADF	200	2,000	4,600	2
o Transponder	500	1,500	5,900	2
o DME	2,800	4,700	9,000	2
o Encoding Altimeter	500	2,100	18,000	2
o Radar Altimeter	1,000	5,400	11,500	1
o 3 axis autopilot (w/couplers)	5,000	23,000	97,000	1
o Flight Director	2,500	27,000	46,000	1
o Weather Radar	5,500	17,000	37,000	1
o R-Nav	1,900	16,000	80,000	1
o Anti-ice				70,000 ⁽²⁾
o O ₂				
o Air Conditioning				

(1) Avionics Directory and Buyers Guide AOPA Pilot, 6/79

(2) Telecon with manufacturer of 19 passenger aircraft, 9/79

(3) One required if flight director installed

source prices included the avionics identified on Table XI. Non-Blue Book sources represented best manufacturer estimates on the specific item-by-item prices based on the Table XII list. The Blue Book cost data are for an "average" aircraft defined as an aircraft that is currently licensed, that is in compliance with pertinent Airworthiness Directive (AD) notes, has about 300 hours of airframe time for each year since manufacture (low for commuter use whose aircraft average 2000-3000 block hours per year), has no major damage history, and with engine time not exceeding 50% of the required time between overhaul.

It is emphasized that prices are rapidly escalating due to the current commuter category aircraft demand. In view of the definite "sellers market," aircraft prices will probably increase at a disproportionate rate when compared with historical increases. Thus, the Table X purchase price figures should be considered as guidelines only.

Table X shows that commuters choosing the smaller 4-6 passenger aircraft will require a capital investment of \$140-200,000 with somewhat lesser investment requirements for used aircraft in this category depending on age. The 7-10 passenger aircraft purchasers must pay between \$250-400,000 for new aircraft with 11-15 passenger aircraft buyers paying \$400-650,000. New designs not yet produced in the latter category are projected at \$1.3 million. The 16-19 passenger category new aircraft will require investments of \$0.5 to \$1.5 million with a \$1.9 million investment for the projected planned aircraft. Some older used aircraft would require significantly less investment but would undoubtedly be very high-time airplanes. In the larger aircraft categories, investment would be required in the \$0.7 to \$4 million range for up through 40 passenger capacities with current choices limited to the SD 330 and the older Nord 262. The planned 30 plus passenger aircraft represent the higher end of the spectrum and would require a projected \$3-4 million investment in 1979 dollars. The larger 40-60 passenger aircraft will require investments in the range of \$5-6 million for new production aircraft with older F-27 and Convair series aircraft representing significantly less of an investment. Again, these older designs are usually very high-time aircraft.

2. DIRECT OPERATING COSTS

Table X also identifies estimated total DOC's in dollars per block hour as a function of three different stage lengths - 100, 200, and 300 statute miles. The Aerospace commuter DOC model recently developed for NASA/Ames (Reference 2) was used for these estimates. Assumptions included the following:

- o Utilization of 3000 blk hr/yr
- o Straight line depreciation over 15 years to 15%
- o Fuel at \$0.54/U.S. gallon
- o Prices are 1979 \$; DOC elements are otherwise computed for 1978 \$.

Table X shows, if the average 200 mile stage length is selected as representative, direct operating costs of the 4-10 passenger category aircraft vary from \$60-100 per block hour with the 11-19 passenger aircraft varying from \$113-200 per block hour. In selected cases, the physical and performance parameters necessary to estimate direct operating costs were not available. The larger aircraft in the 20-40 and 40-60 passenger categories will vary from approximately \$215-435 per block hour to \$400-570 per block hour, respectively.

B. TASK 2. COMMUTER AIR CARRIER AIRCRAFT ACQUISITION PRACTICES

Field interviews and regulatory data review of the commuters shown on Table VI gave insight into their aircraft acquisition practices and financial terms. Most of the data were obtained from financial statements, and, for this particular task, focused on their long term debt (LTD) characteristics to learn about amounts and sources of debt financing and loan terms. For comparison purposes, total assets and equity amounts and forms were studied. In some cases the long term debt included selected working capital loans that were not obtained for the acquisition of aircraft and were thus of less interest in identifying aircraft acquisition practices and sources. However, in practically all cases, the majority of the long term debt was associated with aircraft financing. Working capital loans tended to be either a very small percentage of the LTD or were for relatively short time periods and were thus carried on the balance sheets as current liabilities.

1. LONG TERM DEBT SOURCES

Table XIII was prepared to identify the total assets, LTD, and equity characteristics for each carrier in view of other features to enable comparative identification of methods used by different commuter air carriers to finance aircraft. Again, carriers are not identified by name to protect confidentiality but are grouped by fleet size category (large, medium, and small). Identified characteristics for the latest year for which data were available, include:

- o The number of years in the commuter air carrier business
- o The type of ownership
- o Fleet size
- o Aircraft size
- o CY-1973 traffic statistics
- o Total assets
- o Long term debt characteristics
- o Equity features.

The long term debt characteristics include, where available:

- o Individual loan amounts
- o Loan source (i.e., commercial bank; convertible debenture issue; manufacturer; personal, corporate, or stockholder loans, etc.)
- o Percentage of the total long term debt associated with each source
- o Type of loan security or guarantee (i.e., equipment collateral, Federal agency guarantee, personal guarantee, etc.)

TABLE XIII. COMPUTER AIR CARRIER LONG TERM DEBT CHARACTERISTICS

CARRIER	YRS. IN COMMERCE BUSINESS	CHARACTERISTICS BY TYPE						LONG TERM DEBT / FINANCING RATES / YEARS						EQUITY RATES / YEARS	
		OWNER SHIP	TYPE	FAIR SLEEP	SLEEP SIZE	SLEEP IN CARGO	SLEEP IN CARGO	SLEEP IN CARGO	SLEEP IN CARGO	SLEEP IN CARGO	SLEEP IN CARGO	SLEEP IN CARGO	SLEEP IN CARGO	SLEEP IN CARGO	SLEEP IN CARGO
A	1	PC	L	S.M	S	S	S	S	S	S	S	S	S	S	S
B	>10	PC	L	M.L	L	L	L	L	L	L	L	L	L	L	L
C	>10	CHE	L	M.L	L	L	L	L	L	L	L	L	L	L	L
D	>10	CHE	L	M	L	L	L	L	L	L	L	L	L	L	L
E	>10	SC	L	M.L	L	L	L	L	L	L	L	L	L	L	L
F	6	CHE	L	M.L	M	S	S	S	S	S	S	S	S	S	S
G	9	PC	L	M	L	S	S	S	S	S	S	S	S	S	S
H	>10	CHE	L	S.L	S	L	L	L	L	L	L	L	L	L	L
I	>10	CHE	L	M.L	S	L	L	L	L	L	L	L	L	L	L
J	>10	CHE	L	M.L	S	L	L	L	L	L	L	L	L	L	L
K	>10	CHE	L	S	M	S	S	S	S	S	S	S	S	S	S
L	>10	CHE	L	S.M	S	S	S	S	S	S	S	S	S	S	S
M	>10	CHE	L	S	M	S	S	S	S	S	S	S	S	S	S
N	>10	CHE	L	S	M	S	S	S	S	S	S	S	S	S	S

TABLE XIII. COMPUTER AIR CARRIER LONG TERM DEBT CHARACTERISTICS (Continued)

CARRIER	YRS IN COMMERCE	CHARACTERISTICS (CY 1978)					LONG TERM DEBT / FINANCING (LATEST YEAR)				EQUITY (LATEST YEAR)	
		OPERATING STATUS	FLEET SIZE	ALLEGED SIZE	AMOUNT PAID	AMOUNT PAID	AMOUNT PAID	AMOUNT PAID	AMOUNT PAID	AMOUNT PAID	AMOUNT PAID	AMOUNT PAID
A	4	CAC	4	5	5	5	5	5	5	5	5	5
B	10	CAC	10	5	5	5	5	5	5	5	5	5
C	8	CAC	8	5	5	5	5	5	5	5	5	5
D	6	CAC	6	5	5	5	5	5	5	5	5	5
E	10	CAC	10	5	5	5	5	5	5	5	5	5
F	7	CAC	7	5	5	5	5	5	5	5	5	5
G	10	CAC	10	5	5	5	5	5	5	5	5	5
H	10	CAC	10	5	5	5	5	5	5	5	5	5

TABLE XIII. COMPUTER AIR CARRIER LONG TERM DEBT CHARACTERISTICS (Continued)

CARRIER	YRS IN CARRIER BUSINESS	CHARACTERISTICS (CY 1970)						LONG TERM DEBT FINANCING (LATEST YEAR)						EQUITY (LATEST YEAR)		
		COMMON SHIP	UNITED SIZE	ALLIED SIZE	AMERICAN PASS	AMERICAN CARGO	AMERICAN NAVI	TOTAL ASSETS % NA	AMOUNT % NA	SOURCE	% OF TOTAL	GUARANTEE	INTEREST RATE 1-3	TOTAL DURATION (YRS)	AMOUNT % NA	FORM
P	>10	S	M	M	S	S		0.3 (1970)	1.6 (1970)	PARENT CO	100	NA	NA	NA	0.1 11.46	COMMON STOCK ACCUM DEFICIT
Q ⁽¹⁾	2-1	P	S	S	S	S		0.3 (1970)	0.03 (1970)	PARTNER LOAN	100	PERKS	NA	NA	0.1 0.4	PARTNER INVEST PARTNER INVEST OPERATING DEFICIT
R	4	CHC	S	S, M	S	S		1.4 (1970)	0.7 (1970)	COMMON BANK	100	EQUIP COLL	0.134 + 10% 0.431 + 10% NA	1-5	0.50 0.02	COMMON STOCK ADD PAID IN RET EARN DEF
S	1	SL	S	M	S	S		1.2 (1970)	0.00 1.10 0.21	COMMON BANK COMMON BANK COMM DEBT	88 52 10	SBA EQUIP COLL/PERKS	9.75 9.5 11.5 10	9 5-7 10	0.1 0.2 0.1	COMMON STOCK PAID IN CAPITAL RET EARNINGS
T	8	CHC	S	S, M	S	S		1.0 (1970)	0.21 0.21 0.20	COMMON BANKS CAPITAL LEAS MANUFACTURER	4 4 32	NA	NA	NA	0.00 0.00	COMMON STOCK RET EARNINGS
V	9	CHC	S	S	S	S		0.3 (1970)	0.12 0.02	COMMON BANK STOCKHOLDER LOAN	86 14	SBA, EQUIP COLL	PRIME + 2.5 NA	10 NA	0.002 0.010	COMMON STOCK RET EARNINGS
W ⁽¹⁾	>7	CHC	S	S	S	S		0.5 (1970)	0.02 0.30	CORP INVESTOR COMMON BANK	4 94	UNSEC EQUIP COLL	10 10-14	NA 7	0.01 0.03	COMMON STOCK RET EARNINGS
X	>5	CHC	S	M	M	S		1.4 (1970)	0.8 (1970)	COMMON BANK	100	NA	NA	NA	0.001 0.116 40.750	COMMON STOCK PAID IN CAPITAL ACCUM DEFICIT
Y	8	CHC	S	M	M	S		3.1 (1970)	1.8 0.1	COMMON BANK FINANCE CORP	95 5	EQUIP COLL EQUIP COLL	9-12 - 10% 8%	5-7 3	0.10 0.34 40.34	COMMON STOCK CAPITAL SURPLUS RET EARN DEF
Z ⁽¹⁾	2-5	CHC	S	S	S	S		0.09 (1973)	0.22 0.08	STOCKHOLDER NOTE CORP LOAN	73 27	NA NA	NA NA	NA NA	0.2 0.7	COMMON STOCK PAID IN CAPITAL RET EARN DEF
AB	3	SC	S	S	S	S		0.14 (1977)	0.02 0.01 0.01	COMMON BANK CREDIT UNION MANUFACTURER	31 12 57	EQUIP COLL EQUIP COLL EQUIP COLL	NA	NA	0.02 (1977)	NA
AD	>10	SC	S	M, L	L	S		3.8 (1977)	0.70 0.04 0.06	COMMON BANK COMMON BANK MANUFACTURER	88 4 8	CORP ASSETS EQUIP COLL EQUIP COLL	10 PRIME + 1-1/2 10-2	8 3 2	1.8 0.1 11.3	COMMON STOCK PAID IN CAPITAL ACC DEFICIT

(1) S-Small (<10 Pass); M-Medium (10-19 Pass); L-Large (>19 Pass)
 (2) S-Small (<50,000 lbs); M-Medium (50,000-149,999 lbs); L-Large (>150,000 lbs)
 (3) S-Small (<50,000 lbs); M-Medium (50,000-149,999 lbs); L-Large (>150,000 lbs)
 (4) Ownership: PR-Private; CHC-Closed Held Corp; P-Partnership; PC-Public Corp; SC-Subsidiary Corp
 (5) S-Small (<500,000 lbs); M-Medium (500,000-5,000,000 lbs); L-Large (>5,000,000 lbs)
 (6) S-Small (<500,000 lbs); M-Medium (500,000-5,000,000 lbs); L-Large (>5,000,000 lbs)
 (7) Currently Out of Business
 (8) NA-Not Available

- o Annual interest rate
- o Total duration of the loan.

Table XIV further summarizes these characteristics and identifies appropriate totals for the various debt financing sources, the number of carriers using each source, long term debt amounts, the percentage of the debt financing obtained from each source and the ranges of annual interest rates and loan durations.

As can be seen from Table XIV, by far the majority of commuter air carriers obtain their long term debt financing from commercial banks. Twenty-one of the 30 carriers for which data were obtained had one or more loans with such institutions providing 58% of the total long term debt attributable to these carriers. Private sources (i.e., stockholder loans, personal loans by investors or company officers, etc.) were the next most used means reflecting only 3% of the total debt but used by six carriers. Manufacturers (including manufacturer finance corporations) were sources used by five carriers for 11% of the total debt. Two wholly owned subsidiaries borrowed from their parent company for 12% of the total debt. Convertible debenture issues, SBA loans, finance corporations, credit unions, etc., accounted for 6% of the total debt. Financing sources were not identifiable from the available data for 10% of the total debt. Interest rates varied considerably with the lower values assumed to be associated with loans issued approximately three or four years ago when interest rates were lower. (Issue dates of many of the loans were not available and could not be compiled.) Loan durations were normally in the 7-10 year range for all sources. Equipment collateral represented the most prevalent security for loans, although personal guarantees were features in some of the commercial bank loans. Five loans were also identified that had either SBA or FmHA Federal guarantees.

2. EQUITY

In the case of equity financing, Table XIII shows the small number of the commuter air carriers that used public equity issues. As the majority of the carriers were closely held corporations, common stock was issued but usually

TABLE XIV. SAMPLED COMMUTER AIR CARRIER LONG TERM DEBT FINANCING SOURCES

SOURCE	No. CARRIERS USING	AMOUNT (\$M)	% OF TOTAL	TYPICAL LOAN TERMS		
				ANNUAL INTEREST (%)	TOTAL DURATION (yr)	
COMMERCIAL BANKS	21	31.44	58	LOW - 7 HIGH - PRIME + 6	LOW - 7 HIGH - 10	
PRIVATE (incl stockholder loans)	6	1.64	3	LOW - 7 HIGH - 12	LOW - 10 ⁽¹⁾ HIGH - 10 ⁽¹⁾	
CONVERTIBLE DEBENTURE ISSUE	3	1.10	2	LOW - 6 HIGH - 10	LOW - 5 HIGH - 10	
MANUFACTURERS	5	6.04	11	LOW - 8.5 HIGH - 11.0	LOW - 2 HIGH - 7	
PARENT CO	2	6.20	11	LOW - 8 ⁽¹⁾ HIGH - 8 ⁽¹⁾	LOW - 3 HIGH - 15	
SBA	2	0.52	1	LOW - 8 1/4 ⁽¹⁾ HIGH - 8 1/4 ⁽¹⁾	LOW - 7 ⁽¹⁾ HIGH - 7 ⁽¹⁾	
OTHER (Credit Union, Finance Corp, Capitalized Leases, etc)	5	2.22	4	LOW - 8 HIGH - 16	LOW - 2 HIGH - 7	
SOURCE NOT AVAILABLE	4	5.44	10	LOW - NA HIGH - NA	LOW - NA HIGH - NA	
TOTAL		54.60	100			

(1) Only one data point available

held by a very small number of stockholders. In a number of cases, additional paid in capital was indicated but not specific details on the source indicated. Moreover, four of the thirty carriers are in a negative equity position with many others showing very little equity.

Section IV further analyzes selected financial ratios associated with the data on Table XIV, in view of each carrier's characteristics.

C. TASK 3. FINANCIAL INDUSTRY CREDIT STANDARDS

Eleven members of the financial community were contacted to establish industry credit standards against which commuter air carriers were evaluated. Included were commercial banks, investment banks, insurance companies, venture capital firms and finance corporations. Seven aircraft manufacturers were also contacted as to their role in arranging or granting aircraft acquisition financing and attendant purchase agreement requirements. Before discussing any specific standards, however, it should be emphasized that each institution contacted indicated that credit evaluation is much more of an art than a science. Although quantitative parameters (such as historical or projected financial ratios) can influence a "go-no-go" decision, there are no hard and fast rules or guidelines in granting a loan. A number of cumulative quantitative and qualitative factors coupled with the traditional "gut feel" are usually combined to finalize a decision.

However, although the weighting of various evaluation factors varied depending upon the type of financial institution, all were interested in six fundamental factors. These were: management capability, historical performance, financial ratios, business projections, quality of collateral and loan guarantees. As the degree of emphasis on each of these elements varied, the resulting industry standards are discussed in the following paragraphs by type of financial institution.

1. COMMERCIAL BANKS

Although commercial banks are traditionally short term money lenders, more and more are approving aircraft acquisition loans of up to 7-10 years, assuming other evaluation criteria are properly met. In view of deregulation and the projected growth of the commuter air carrier industry, more banks are becoming more receptive to, and even soliciting, commuter air carrier business.

a. Management Capability

One of the more important evaluation parameters used by a commercial bank is their perception of management capability. Most banks indicated that this parameter represents a major part of their loan decisions and without a good perception of such capability, the loan will not be made. Management evaluation factors, however, represent qualitative criteria and are difficult to quantify. Emphasis is placed on the background of key management personnel, character references and reviews, past history and performance in business, overall experience and any previous problem areas.

b. Historical Performance

Historical performance represents another key factor evaluated by commercial banks. In fact, without a 1-3 year successful "track record," most commercial banks will refuse to even consider a loan, thus forcing "new starts" to seek capital from less conservative elements of the industry. Further, this track record must reflect prudent decisions regarding expansion, asset acquisition, market selection, indebtedness, growth, etc.

c. Financial Ratios

Financial ratios, although not necessarily representing the major portion of the loan award decision, are specifically reviewed by the banks and are the easiest parameters to show in a relatively quantitative sense. As cash flow lenders, the primary ratios of interest to a bank are debt coverage capabilities, operating cost ratios, and current ratios. Also used are debt/equity or debt ratios and long term debt to flight equipment value ratios. Table XV defines these ratios and summarizes the traditional values preferred by five different banks and one insurance company who use ratios in their evaluation decision. (The banks shown have, to date, awarded aircraft acquisition loans to 12 different commuter air carriers over the last few years and have yet to have any repayment problems.)

These ranges do not necessarily reflect rigid standards applied to commuters as very few commuters can, in fact, meet all of these ratios. The values do, however, reflect a quantifiable but conservative "baseline" that the bank would consider definitely credit-worthy assuming management capability, historical performance, etc. are satisfactory.

TABLE XV. KEY FINANCIAL RATIOS (COMPUTER AIRLINES)

CATEGORY	RATIO	FORMULA	COMMERCIAL BANK	COMMERCIAL BANK	COMMERCIAL BANK	COMMERCIAL BANK	INSURANCE CO.
LEVERAGE	DEBT/EQUITY	TOTAL LIABILITIES TOTAL EQUITY	1 1/2 - 2 1/2 : 1 PREFERRED (NG) ⁽¹⁾ 4.5 - 5 : 1 (G) ⁽¹⁾	MAX 5 : 1	MAX 2 : 1 1 1/2 : 1 PREFERRED	(4)	MAX 1.88 : 1; 1 - 1 1/2 : 1 PREF (G)
	OR						
	DEBT RATIO	TOTAL LIABILITIES TOTAL ASSETS	70 - 75% (NG) 80% (G)	80%	70 - 75%	(4)	65% (G)
	LTD/ASSET RATIO	LONG TERM DEBT FLIGHT EQUIP & SPARES VALUE	60 - 75%	(4)	1 : 1	(4)	(4)
LIQUIDITY	DEBT SERVICE COVERAGE	NET INCOME (incl depr) BEFORE INT & TAXES LONG TERM DEBT + INT	1.25 : 1 (G) 1.35 : 1 (NG)	(4)	1.25 - 1.5 : 1 ⁽³⁾	(2)	1.35 : 1 (G)
	OPERATING COST RATIO	OPERATING EXPENSES (less Interest)	70 - 85%	(4)	90%	(4)	60 - 70% (G)
	CURRENT RATIO	CURRENT ASSETS CURRENT LIABILITIES	> 1 : 1	(4)	> 1 : 1	(4)	(4)

- (1) NG - non-federally guaranteed loan; G - federally guaranteed loan
(2) 25 - 50% excess cash flow after new debt service and average annual asset expenditures for past 5 years
are deducted from net after tax profit plus depreciation
(3) Prefers depreciation covering principal payment leaving income to cover interest
(4) Ratio may be reviewed but is not necessarily significant in loan decision

Also noted on Table XV, are separate values where a bank indicated that a Federal guarantee would make a difference in a loan award decision. Banks appear to be generally less interested in the availability of Federal loan guarantees than some other members of the financial community. Some banks felt the worth of the equipment as collateral and/or private guarantees were sufficient, assuming other criteria were met. A few did, however, indicate that the existence of such guarantees would somewhat relax their evaluation standards. Smaller banks unable to carry the large amounts of capital required to finance modern commuter aircraft, appear interested in Federal guarantees to assist them in forming a consortia of lending institutions or, alternatively, in selling the guaranteed portion of the loan to other institutions.

Some banks do not insist on audited financial reports as a condition of loan award. One bank, however, felt that due to the varied methods of bookkeeping used by commuter air carriers (and diverse stockholder reasons for owning the airline), audited financial statements prepared by accepted accounting practices should be available, along with the auditor's management letter prior to any Federal guarantee approved.

d. Projections

Financial projections were naturally considered important by all banks contacted. Primarily cash flow lenders, they were extremely interested in insuring debt service coverage for the duration of the loan. Although most banks do not maintain the sophisticated levels of market analysis expertise necessary to evaluate carrier projections in detail, they do evaluate major assumptions including such factors as load factors, projected aircraft operating costs, etc. for overall reasonableness when compared with industry standards.

e. Quality of Collateral

Although less important to a bank than projected cash flow, quality of collateral was considered another evaluation parameter. With many commuter aircraft actually appreciating in value, most banks feel that relatively modern aircraft would not present a problem in meeting their quality criteria. Further, depending upon the size of the loan, it is often normal for a commuter to pledge additional aircraft and assets as security.

f. Covenants

Covenants on aircraft acquisition loans are relatively standard. They include both affirmative and negative covenants. Affirmative covenants usually require (1) the periodic provision of financial statements, (2) maintenance of corporate existence, (3) insurance requirements (4) notification of management changes and new litigation, (5) maintenance of certificates of airworthiness, and (6) in some cases, maintenance of certain levels of working capital and net worth. Negative covenants will typically include prohibition (without bank notification and usually approval) of (1) additional major indebtedness, (2) consolidation and mergers, (3) acquisition or disposal of major assets, (4) payment of dividends, and (5) other factors resulting in major changes in financial status.

g. Typical Loan Terms

Table XVI summarizes typical loan characteristics stated by the five commercial banks and one insurance company. As can be seen from Table XVI, commercial banks typically loan money on a floating rate basis at a specified level above the prime rate. The range above prime stated for a reasonably credit-worthy commuter varied from 1-3 1/2% with three banks indicating that a prime rate loan was not inconceivable for a good risk and a Federally guaranteed loan.

Some banks hesitate to lend money for aircraft acquisition for terms longer than 5 or 6 years. Others, as previously noted, are regularly providing 7-10 year loans, some with balloon payments over the last two years. In some cases, compensating balances are insisted upon with 10 percent of the loan representing a typical amount. However, these banks may adjust the basic loan interest rate to provide them with an equivalent return should a compensating balance not be used. Typical loans are for 75-80% of the collateral value. In the case of a Federal loan guarantee, some banks are willing to finance the unguaranteed portion at a higher rate of interest than the guaranteed portion, although most wish to have the carrier show a true equity interest in the collateral prior to approving the loan. Although some banks do not feel Federal loan guarantees are very significant in lowering a bank's loan interest rate, reductions of 1-2% were stated as probable.

TABLE. XVI TYPICAL LOAN TERMS

LOAN CHARACTERISTIC	COMMERCIAL BANK		COMMERCIAL BANK		COMMERCIAL BANK		COMMERCIAL BANK		COMMERCIAL BANK		INSURANCE CO.	
	FLOATING	PRIME + 2 3/4 - 3 1/2	FLOATING	PRIME + 1 1/4 - 1 1/2	FLOATING	PRIME + 1 - 2	FLOATING	PRIME + 1 1/2 (2)	FLOATING/FIXED	FIXED		
TYPE INTEREST RATE												
% INTEREST RATE (MG)(4)												
% INTEREST RATE (G)(4)												
TOTAL LOAN TERM (yrs)												
% OF COLLATERAL VALUE FINANCED												
COMPENSATING BALANCE REQUIRED												

- (1) Prefers to finance non-guaranteed portion at floating rate and sell guaranteed portion at fixed rate
 (2) With 15% compensating balance. Equivalent to approx prime + 3 without compensating balance
 (3) Will not issue loan without federal guarantee
 (4) MG - Without federal guarantee
 G - With federal guarantee

2. INVESTMENT BANKS

Investment banks provide private placement services for a fee. The investment broker will act for a commuter air carrier in placing the guaranteed portion of a loan with long term fixed rate investors (i.e., insurance companies, pension funds, etc.). In such cases, a Federal guarantee is considered almost fundamental in order to place all or part of a loan with such conservative elements of the financial community. Although some brokers profess to use essentially the same financial ratios as commercial banks, the loan is often made based only on the Federal guarantee and some evaluation of the quality of collateral. In general, loan amounts reflect 80% of the collateral value (usually the guaranteed portion) with fixed interest rates similar to the interest paid on treasury bonds or government agency paper. Loan durations are usually in the 10-15 year time period. Such brokers, although charging a fee to the applying airline, can provide a valuable service in placing the guaranteed portion of the loan leaving the carrier to raise only the nonguaranteed portion through other sources - often his local bank, private investors, or internal funds.

3. INSURANCE COMPANIES

Although there are a few of the smaller insurance companies that will deal directly with a commuter air carrier for an aircraft acquisition loan, the majority are extremely conservative and are interested only in guaranteed, long term, fixed rate investments. Often solicited by an investment broker in behalf of a commuter airline, such companies normally consider a Federal guarantee essential, although marketability of the collateral is also a major consideration.

Table XV included quantitative financial ratios considered important by one insurance company in evaluating the credit-worthiness of an operator's performance. These ratios reflect added conservatism (even in view of a Federal guarantee) when compared to bank standards. Typical fixed-interest rates will be in the neighborhood of treasury bonds or government agency paper rates with 10 to 15 years reflecting a typical loan duration range. In some cases, insurance companies will form a consortia with a bank and other lending institutions with the commercial bank becoming the lender of record, responsible for servicing the loan, and carrying the unguaranteed portion of

the loan. The insurance company then carries the guaranteed portion of the loan. Insurance companies will typically insist that the loan only represent 80% of the collateral value (usually the guaranteed portion).

4. VENTURE CAPITAL FIRMS

As indicated above, few if any of the traditional lending firms will process a loan for a commuter operator without a historical operating record of at least one, and in many cases, two or three years. Thus, the only financing choice open to a new carrier without private capital sources often will be the less conservative venture capital firms. Such firms may be willing to provide higher risk capital but alternatively look for higher rates of return on their investments. A venture capital firm will also normally insist on an equity interest reflected in either preferred stock or convertible debentures. The amount of equity required will vary considerably depending upon the type of business, and potential return. One firm indicated that the provision of 100% of the required expansion capital will usually result in about 60% ownership retained by the venture capital firm. Similarly, the provision of 50% of the required capital will usually result in about 40% ownership retained by the venture capital firm.

It should be noted that most venture capital firms are not specifically interested in commuter airlines. The commuter business is a highly competitive, capital intensive industry that traditionally yields low rates of return. Thus, it is more the exception than the rule if a commuter is able to raise capital from such firms. Many commuters are also reluctant to relinquish ownership in order to raise capital. In some cases, however, Small Business Investment Companies (SBIC's), which are private SBA financed entities, represent a possible capital source for some commuters without a "track record" who are willing to relinquish ownership.

5. FINANCE COMPANIES

There are a number of commercial finance corporations that are actively engaged in financing aircraft. They desire primarily to lease the aircraft to a carrier rather than lend capital for their acquisition. However, in some cases, acquisition loans can be obtained from such corporations which are somewhat less conservative in terms of financial ratio criteria, but will

alternatively insist on a higher loan interest rate. Both floating and fixed rate loans can be arranged but the floating interest rate will typically be three to five points over prime (or one to two points higher than a commercial bank rate). In the case of fixed rate loans, the interest rate can be approximated by relating it to corporate bond rates for BAA credit. Loan durations are typically in the ten to twelve year range. One advantage of a finance company is their willingness to establish a loan repayment schedule based on level payments which precludes high principal and interest payments early in the loan term.

6. MANUFACTURERS

a. Aircraft Financing

In some cases, financing assistance can be obtained directly from aircraft manufacturers, as manufacturers have a natural incentive to help provide required capital for purchase of their aircraft.

The U.S. aircraft manufacturers maintain contact with, and are able to direct carriers to, various financial institutions that are known to provide financing to commuter carriers. They will also help prepare appropriate loan or loan guarantee applications. Additionally, a few of the domestic manufacturers have subsidiary finance corporations that, although principally interested in lease arrangements, will sometimes help financing of aircraft.

Subsidized foreign manufacturers often have arrangements with government owned banks that may provide more favorable loan conditions to buyers of their aircraft available in the U.S. In promoting the sale of one foreign aircraft, for example, a reasonably credit-worthy operator can make arrangements with a government bank in that country to provide financing terms up to 85% of the aircraft purchase price on a 7-year term loan at 8-1/2%. Deferred payment arrangements are also possible. Although insisting on the aircraft as collateral, it is reported that they also encourage the FAA guarantee loan program even though first lien on the aircraft is relinquished.

Other foreign manufacturers are providing similarly attractive terms by promoting long term loans at interest rates well below that provided by traditional U.S. banking institutions. There have also been some cases where a foreign manufacturer will guarantee repurchase of an aircraft from a

financial institution for the amount of the loan (plus interest) if the commuter air carrier defaults. This provides the bank, which normally does not wish to get involved in the disposition of collateral in the case of default, with a guaranteed buyer at a guaranteed rate.

b. Purchase Agreement Requirements

The Loan Guarantee Program prohibits the refinancing of an aircraft purchase loan with the exception of short term loans for aircraft deposits. However, liquidation of such loans by the guaranteed loan is permitted only if the short term loan amount does not exceed 30% of each aircraft's purchase price. Thus, the deposit and progress payment requirements of the commuter aircraft manufacturers are of interest. Table XVII summarizes typical provisions related to such payments to manufacturers, extracted from available purchase agreements and supplemented by direct contacts with the manufacturers. The table shows that initial deposit requirements varied from 1% to 20%. Requirements for progress payments vary with the larger amounts normally associated with the newer, larger aircraft. This would be expected due to the requirement for a manufacturer to have an increasing investment in each aircraft as the production cycle progresses. Higher larger aircraft costs, cash flow considerations, interest payments, amortization of new tooling, etc., all play a part in establishing these newer aircraft payment schedules. These factors dictate the progress payment amounts and schedules. Most manufacturers whose deposit and progress payment requirements were in excess of 30% of each aircraft's purchase price, did not indicate that they would arbitrarily reduce them to stay within the Loan Guarantee Program's limit. Some, however, indicated a willingness to work with an operator in special cases in order not to exceed the 30% limit before the guarantee is executed. Most schedules, however, do not exceed the 30% limit until two to four months prior to delivery (approximately 60% of the way through the production cycle). Thus, prudent timing of the loan guarantee is specifically indicated for both the operator and the FAA where the operator is forced to take a short term loan for deposit and progress payment purposes prior to the guarantee award.

TABLE XVII. AIRCRAFT MANUFACTURERS PAYMENT REQUIREMENTS

AGREEMENT ITEM	DOMESTIC MANUFACTURER	DOMESTIC MANUFACTURER	DOMESTIC MANUFACTURER	FOREIGN MANUFACTURER	FOREIGN MANUFACTURER
• AIRCRAFT CAPACITY • YEARS IN PRODUCTION • NUMBER OF AIRCRAFT PURCHASED • TYPICAL PRODUCTION TIME • CONTRACT PRICE & DELIVERY DATE • INITIAL DEPOSIT (per aircraft) • PROGRESS PAYMENTS (per aircraft) • FINAL PAYMENT • BUYER DELAYS OR DEFAULT • PROGRESS PAYMENTS • ACCEPTANCE DELAY • CANCELLATION • SELLER DELAYS OR DEFAULT • EXCUSABLE • OTHER	MEDIUM (15-19) 6 6-7 mo ~ \$1.3M PER AIRCRAFT, 10/78-3/80 4% 6 mo PRIOR TO DELIVERY - 6% 4 mo PRIOR TO DELIVERY - 20% 2 mo PRIOR TO DELIVERY - 20% 50% ... SELLER'S EXPENSES ... DELIVERY EXTENSION OR NO PENALTY TERMINATION BREACH OR DEFAULT IF DELIVERY DELAY OVER 90 DAYS	SMALL (1-10) 1 5 mo \$10.2M PER AIRCRAFT, 1979 15-17% NONE 83-85% SELLER'S NON-RECOVERABLE EXPENSES DELIVERY EXTENSION BUYER NO-PENALTY TERMINATION	MEDIUM (15-19) NEW 1 5 mo \$1.6M PER AIRCRAFT, 1979 (6) 4% (LETTER OF CREDIT) 6 mo PRIOR TO DELIVERY - 2% (1) 3 mo PRIOR TO DELIVERY - 2% (1) 96% SELLER'S NON-RECOVERABLE EXPENSES DELIVERY EXTENSION BUYER NO-PENALTY TERMINATION	MEDIUM (15-19) 1-10 1 8 mo 90.87M, 10/78 10% NONE 90% 1-12% PER MO INTEREST; SELLER CAN TERMINATE AFTER 15 DAYS ... SELLER'S NON-RECOVERABLE EXPENSES DELIVERY EXTENSION	MEDIUM (15-19) 1-10 1 8 mo 90.87M, 10/78 10% (non-refundable) 1 mo PRIOR TO DELIVERY - 10% 80% 1-12% PER MO INTEREST; SELLER CAN TERMINATE AFTER 15 DAYS ... SELLER'S NON-RECOVERABLE EXPENSES DELIVERY EXTENSION BUYER NO-PENALTY TERMINATION

(1) Cash conversions of Letter of Credit

TABLE XVII. AIRCRAFT MANUFACTURERS PAYMENT REQUIREMENTS (Continued)

AGREEMENT ITEM	FOREIGN MANUFACTURER	FOREIGN MANUFACTURER	FOREIGN MANUFACTURER	FOREIGN MANUFACTURER
• AIRCRAFT CAPACITY • YEARS IN PRODUCTION • NUMBER OF AIRCRAFT PURCHASED • TYPICAL PRODUCTION TIME • CONTRACT PRICE & DELIVERY DATE • INITIAL DEPOSIT (see #11C(4)) • PROGRESS PAYMENTS (see #11C(4))	LARGE (1-10) 1-3 2 10 mo 2-4 mo/AIRCRAFT, 7/79 & 12/79 7% 6 mo PRIOR TO DELIVERY - 25% 3 mo PRIOR TO DELIVERY - 25%	LARGE (1-10) 4 2 8 mo 10% \$1.8M PER AIRCRAFT, 12/78, 6/79 6 mo PRIOR TO DELIVERY - 10%	MEDIUM (15-10) 10 1 8 mo 1% \$1.3M PER AIRCRAFT, 1979 6 mo PRIOR TO DELIVERY - 15%	LARGE (1-10) 1 14 mo 1% \$5.5M PER AIRCRAFT, 1979 CONTRACT SIGNING OR 14 mo's PRIOR TO DELIVERY (whichever more) - 15% 9 mo PRIOR TO DELIVERY - 15% 6 mo PRIOR TO DELIVERY - 15% 3 mo PRIOR TO DELIVERY - 15% 80% 1-17% PER MO INTEREST SELLER'S NON-RECOVERABLE EXPENSES DELIVERY EXTENSION NO PENALTY BUYER TERMINATION
• FINAL PAYMENT • BUYER DELAYS OR DEFAULT • PROGRESS PAYMENTS • ACCEPTANCE DELAY • CANCELLATION • SELLER DELAYS OR DEFAULT • EXCUSABLE • OTHER	45% 10% PER YEAR; SELLER CAN TERMINATE AFTER 30 DAYS SELLER'S NON-RECOVERABLE EXPENSES DELIVERY EXTENSION NO PENALTY BUYER TERMINATION PLUS 10% PER YEAR INTEREST ON PAID FUNDS	80% ONE-FOR-ONE DELIVERY DELAY + PRIME RATE PLUS 2 INTEREST PENALTY DELIVERY EXTENSION UP TO 6 mo; BUYER MUST PAY SELLER UNRECOVERABLE EXPENSES BUYER TERMINATION PLUS PRIME RATE INTEREST	84% SELLER'S NON-RECOVERABLE EXPENSES (2) DELIVERY EXTENSION NO PENALTY BUYER TERMINATION	

(2) Total 1% deposit refundable under any circumstances. 15% progress payment also totally refundable if financing cannot be arranged by delivery date.

Table XVII also summarizes the typical terms and conditions associated with both buyer and seller delays/defaults. Although some agreements are more specific than others, most reflect a small interest penalty for late progress payments with major default or termination penalties usually limited to actual seller or buyer nonrecoverable expenses.

D. TASK 4. COMMUTER AIR CARRIER FINANCIAL VIABILITY

This section addresses three areas related to commuter air carrier financial viability. The first involves comparison of commuter air carrier financial ratios with those used by many financial institutions to measure credit worthiness; the second addresses factors contributing to commuter air carrier failures; and the third summarizes the replacement service history in markets where commuters replaced certificated air carriers. Each of these subjects is discussed in the following paragraphs.

1. COMMUTER AIR CARRIER FINANCIAL RATIOS

As indicated in Section IVC, there were six financial ratios used in varying degrees by financial institutions which can be readily quantified from carrier balance sheets, income statements, and statements of financial change. Specifically defined in Table XV, these six ratios are debt/equity or debt ratio (these can be used interchangeably), long term debt/asset, debt service coverage, operating cost ratio and current ratio. Although such ratios do not represent absolute or singularly significant credit-worthiness standards, they are reviewed by most financial institutions and are the easiest to compare in a quantitative manner. Accordingly, Table XVIII was prepared listing ratios for each year that data were available for the thirty carriers involved. This table groups the carriers by fleet size and identifies ownership characteristics, years in business and traffic statistics associated with each carrier. Table XVIII then lists the associated financial ratio values for comparison with the desired financial institution's standard values identified at the top of the table.

TABLE XVIII. FINANCIAL RATIO COMPARISON

CARRIER	YRS. IN COMMUTER BUSINESS	FINANCIAL RATIO										COMMUTER AIR CARRIER FINANCIAL RATIOS										LTD/ASSET														
		TRADITIONAL FINANCIAL STANDARDS WITHOUT FEDERAL GUARANTEE										DEBT/EQUITY										OR					DEBT RATIO					MG: 0.75 (maximum) G: 1.00 (maximum)				
		TRADITIONAL FINANCIAL STANDARDS WITH FEDERAL GUARANTEE										MG: 3.0 (maximum) G: 5.0 (maximum)																								
		CHARACTERISTICS (CY 1970)																																		
		OWNER- SHIP	FLEET SIZE	AIRCRAFT SIZE	ANNUAL PASS	ANNUAL CARGO	ANNUAL MAIL	1973	1974	1975	1976	1977	1978	1979	1973	1974	1975	1976	1977	1978	1979	1973	1974	1975	1976	1977	1978	1979								
A	5	CHC	L	S, M	S	S	-	-	7.0	7.5	1.8	32.3	45.8	-	-	0.57	0.88	0.64	0.97	0.98	-	-	0.13	0.21	0.05	1.3	0.16									
B	>10	PC	L	M, L	L	L	S	-	2.2	1.9	-	-	0.8	-	0.69	0.65	-	-	-	0.45	-	0.57	0.54	-	-	-	0.40									
C	>10	CHC	L	M, L	L	S	-	-	-	-	-	1.3	1.56	-	-	-	-	-	0.57	0.60	-	-	-	-	-	0.53	0.59									
D	>10	CHC	L	M	L	S	-	-	-1.7	-1.8	-4.4	-101	-	-	-	2.38	2.21	1.29	1.09	-	-	-	4.59	4.81	2.52	0.36	-									
E	>10	SC	L	M, L	L	S	M	-	-1.5	-1.4	34.5	41.4	-5.0	-	-	3.0	3.72	0.97	0.98	1.25	-	-	0.64	0.90	1.46	1.41	1.35									
F	6	CHC	L	M, L	M	S	-	-	-	-	-	1.7	1.3	-	-	-	-	0.63	0.56	-	-	-	-	-	0.18	0.11	-									
G	9	PC	L	M	L	S	S	-	2.49	2.2	2.7	5.1	-	-	-	0.74	0.68	0.73	0.83	-	*	-	0.65	0.57	0.68	0.67	-									
I	>10	CHC	L	S, L	-	L	L	-	0.6	0.4	0.5	1.1	0.97	-	-	0.39	0.27	0.34	0.51	0.49	-	-	0.28	0.44	0.75	1.07	1.95	-								
J	>10	CHC	L	M, L	-	L	-	-	-	-	-	-	10.1	-	-	-	-	-	-	0.91	-	-	-	-	-	-	0.85									
U ⁽⁷⁾	≈5	CHC	L	S	M	S	-	-32.4	-	2.6	-	-	-	-	1.02	-	0.72	-	-	-	-	1.11	-	0.68	-	-	-	-								

TABLE XVIII. FINANCIAL RATIO COMPARISON (Continued)

FINANCIAL RATIO										DEBT SERVICE COVERAGE										COMMUNIC. AIR CARRIER FINANCIAL RATIOS										CURRENT RATIO							
TRADITIONAL FINANCIAL STANDARDS WITHOUT FEDERAL GUARANTEE										NG: 1.35 (minimum) G: 1.25 (minimum)										NG: 0.75 (maximum) G: 0.90 (maximum)										NG: 1.00 (minimum) G: 1.00 (minimum)							
TRADITIONAL FINANCIAL STANDARDS WITH FEDERAL GUARANTEE																																					
CARRIER	YRS IN COMMUNIC. BUSINESS	CHARACTERISTICS (CY 1978)								1973	1974	1975	1976	1977	1978	1979	1973	1974	1975	1976	1977	1978	1979	1973	1974	1975	1976	1977	1978	1979	1973	1974	1975	1976	1977	1978	1979
		OWNER: SHIP ⁽⁴⁾	FLEET SIZE ⁽²⁾	AIRCRAFT SIZE ⁽¹⁾	ANNUAL PASS ⁽³⁾	ANNUAL CARGO ⁽⁵⁾	ANNUAL MAIL ⁽⁶⁾																														
A	5	CNC	L	S	M	L	S	S	-	-	-	2.83	2.49	-0.29	0.004	-	-	-	-	0.97	0.97	1.16	1.07	-	-	-	-	0.65	0.75	1.18	0.63	0.13					
B	>10	PC	L		M,L	L	L	S	-	2.10	1.90	-	-	-	13.90	-	-	0.89	0.85	-	-	-	0.76	-	-	0.94	1.06	-	-	-	-	-	-	-	1.63		
C	>10	CNC	L		M,L	L	L	S	-	-	-	-	-	-	-	-	-	-	-	-	-	1.74	1.62	-	-	-	-	-	-	-	-	-	-	-	1.31		
D	>10	CNC	L		M	L	L	S	-	-	-2.08	-0.67	12.50	3.34	-	-	-	1.03	1.01	0.92	0.97	-	-	-	-	-	0.05	0.37	0.47	0.56	-	-	-	-	-		
E	>10	SC	L		M,L	L	L	S	M	-	-0.45	-0.71	3.29	2.37	5.54	-	-	1.16	1.10	0.93	0.97	0.87	-	-	-	0.07	0.09	1.73	1.51	2.21	-	-	-	-	-		
F	6	CNC	L		M,L	M	M	S	-	-	-	-	-	0.16	8.08	-	-	-	-	0.96	0.96	-	-	-	-	-	-	-	-	-	-	-	-	-	1.19	1.31	
G	9	PC	L		M	L	L	S	S	-	2.29	1.71	1.97	1.89	-	-	-	0.87	0.87	0.79	0.82	-	-	-	-	0.95	1.11	0.78	0.87	-	-	-	-	-	-	-	
I	>10	CNC	L		S,L	-	L	L	L	-	1.28	1.84	2.81	0.69	3.96	-	-	0.97	0.96	0.89	0.87	0.82	-	-	1.21	1.22	1.23	2.28	1.30	-	-	-	-	-	-	-	
J	>10	CNC	L		M,L	-	L	L	-	-	-	-	-	-	0.41	-	-	-	-	-	-	0.99	-	-	-	-	-	-	-	-	-	-	-	-	-	0.81	
U ⁽⁷⁾	≈5	CNC	L		S	M	M	S	-	-	0.68	-	-	-	-	-	1.21	1.1	-	-	-	-	-	-	1.47	-	0.96	-	-	-	-	-	-	-	-	-	

TABLE XVIII. FINANCIAL RATIO COMPARISON (Continued)

FINANCIAL RATIO										DEBT/EQUITY					DEBT RATIO					LTD/ASSET														
TRADITIONAL FINANCIAL STANDARDS WITHOUT FEDERAL GUARANTEE										MG: 3.0 (maximum) G: 5.0 (maximum)					MG: 0.75 (maximum) G: 0.80 (maximum)					MG: 0.75 (maximum) G: 1.00 (maximum)														
TRADITIONAL FINANCIAL STANDARDS WITH FEDERAL GUARANTEE										OR																								
CARRIER	YRS IN COMMUTER BUSINESS	OWNER- SHIP (4)	CHARACTERISTICS (CY 1978)					FLEET SIZE (2)	AIRCRAFT SIZE (1)	ANNUAL PASS (3)	ANNUAL CARGO (5)	ANNUAL MAIL (6)	1973	1974	1975	1976	1977	1978	1979	1983	1984	1985	1986	1987	1988	1989								
			SHIP	SIZE (2)	FLYING	TYPE (1)	ANNUAL PASS (3)																											
K	4	CHC	M	S,M	S	M	L								1.8	1.5	-	3.2	-	-	-	0.94	0.61	-	0.76	-	-	-	4.74	0.40	-	0.22	-	
L	>10	CHC	M	S	S	S	S	-	-0.6	0.9	-	-	-	-	-	-	-	-	0.4	-	0.39	0.47	-	-	-	0.29	-	-	-	-	-	-	-	-
M	8	CHC	M	L	M	S	S	-	-	-	-	-	-	-	-	-	-	-	0.4	-	-	-	-	-	-	0.26	-	-	-	-	-	0.24	-	-
N	6	CHC	M	S	S	S	S	-	-	-	-	-	-	-	-	-	-	-	1.8	-	-	-	-	-	-	0.65	-	-	-	-	-	-	0.73	-
O	>10	CHC	M	M,L	L	S	S	-	-	-	-	-	-	-	4.2	2.5	-887	-	73.0	-	-	0.80	0.78	1.00	-	0.98	-	-	0.66	0.53	0.74	-	0.91	
AC	>7	CHC	M	M	M	M	M	-	-	-	-	-	-	-	-	-	-	5.1	-	-	-	-	-	-	0.83	-	-	-	-	-	-	0.67	-	
AE	>10	CHC	M	M	M	S	S	M	-	-	-	-	-	-	3.8	3.0	2.8	-	-	-	0.79	0.75	0.74	-	-	-	-	0.50	0.38	0.34	-	-	-	
AH	>10	CHC	M	M	L	S	S	L	-	-	-	-	-	-	-	-	-	1.2	2.0	-	-	-	-	-	0.55	0.67	-	-	-	0	0.06	-	-	

TABLE XVIII. FINANCIAL RATIO COMPARISON (Continued)

FINANCIAL RATIO										DEBT SERVICE COVERAGE					OPERATING COST RATIO					CURRENT RATIO								
TRADITIONAL FINANCIAL STANDARDS WITHOUT FEDERAL GUARANTEE										MG: 1.35 (minimum) G: 1.25 (minimum)					MG: 0.75 (maximum) G: 0.90 (maximum)					MG: 1.00 (minimum) G: 1.00 (minimum)								
CARRIER	YRS IN COMMUTER BUSINESS	OWNER- SHIP (4)	CHARACTERISTICS (CY 1978)						FLEET SIZE (2)	AIRCRAFT SIZE (1)	ANNUAL PASS (3)	ANNUAL CARGO (5)	ANNUAL MAIL (6)	1973	1974	1975	1976	1977	1978	1979	1973	1974	1975	1976	1977	1978	1979	
			SHIP	SIZE	TYPE	TYPE	TYPE	TYPE																				
K	4	CHC	M	S, M	S	M	L	-	-	-	-	-	-	-	-	-	1.0	0.98	-	-	-	-	-	1.50	1.71	-	0.80	-
L	>10	CHC	M	S	S	S	-	-	-	-	-	-	-	-	0.97	1.03	-	-	-	0.94	-	2.34	1.39	-	-	-	2.01	-
M	8	CHC	M	L	M	S	-	-	-	-	-	-	-	-	-	-	-	-	0.88	-	-	-	-	-	-	-	3.18	-
N	6	CHC	M	S	S	S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.61
O	>10	CHC	M	M, L	L	S	-	-	0.97	2.21	0.50	-	1.08	-	-	-	0.98	0.92	2.6	-	0.94	-	-	0.90	0.87	0.54	-	0.79
AC	>7	CHC	M	M	M	M	-	-	-	-	-	M	-	-	-	-	-	-	0.82	-	-	-	-	-	-	-	0.87	-
AE	>10	CHC	M	M	M	S	M	-	-	0.63	1.74	1.04	-	-	-	-	-	-	-	-	-	-	1.20	1.19	1.01	-	-	-
AH	>10	CHC	M	M	L	S	L	-	-	-	-	-	6.30	0.83	-	-	-	-	-	-	-	-	-	-	-	1.27	1.03	-

TABLE XVIII. FINANCIAL RATIO COMPARISON (Continued)

FINANCIAL RATIO										DEBT/EQUITY					DEBT RATIO					LTD/ASSET																							
TRADITIONAL FINANCIAL STANDARDS WITHOUT FEDERAL GUARANTEE										NG: 3.0 (maximum) G: 5.0 (maximum)					OR					NG: 0.75 (maximum) G: 0.80 (maximum)					NG: 0.75 (maximum) G: 1.00 (maximum)																		
CARRIER	YRS IN COMMERCE BUSINESS	OWNER- SHIP ⁽⁴⁾	CHARACTERISTICS (CY 1978)					ANNUAL MAIL ⁽⁶⁾	1973	1974	1975	1976	1977	1978	1979	1973	1974	1975	1976	1977	1978	1979	1973	1974	1975	1976	1977	1978	1979	1973	1974	1975	1976	1977	1978	1979							
			FLEET SIZE ⁽²⁾	AIRCRAFT SIZE ⁽¹⁾	PASS ⁽³⁾	ANNUAL CARGO ⁽⁵⁾	ANNUAL																																				
P	>10	S	S	M	S	-	-	-1.3	-1.4	-	-	-	-	-1.3	-	4.2	3.68	-	-	-	4.8	-	4.71	12.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Q	≈3	P	S	S	S	-	-	-	0.7	2.8	-	-	-	-	-	-	-	0.40	0.74	-	-	-	-	-	-	-	-	-	-	-	0.21	0.47	-	-	-	-	-	-	-				
R	4	CHC	S	S,M	S	S	-	-	-	-	-	1.8	2.0	2.7	1.6	-	-	-	0.63	0.66	0.73	0.41	-	-	-	-	0.76	0.69	0.61	0.55	-	-	-	-	-	-	-	-	-	-			
S	3	SC	S	M	S	-	-	-	-	-	-	-	8.0	8.1	6.7	-	-	-	-	0.89	0.89	0.87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
T	8	CHC	S	S,M	S	S	L	-	2.6	-	-	52.2	-	-	-	0.72	-	-	0.98	-	-	-	1.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
V	9	CHC	S	S	S	S	-	-	-	-	-	-	-	5.1	-	-	-	-	-	-	0.84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
W ⁽⁷⁾	>7	CHC	S	S	S	S	M	-	-	1.9	9.8	3.2	-	-	-	-	0.67	0.90	0.76	-	-	-	-	-	-	-	-	-	-	0.28	0.80	0.71	-	-	-	-	-	-	-	-	-		
X	>5	CHC	S	M	M	S	S	-	-	-	-	-5.8	-17.3	-9.5	-0.35	-	-	-	1.20	1.06	1.11	1.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Y	8	CHC	S	M	M	S	-	-	-	-	-	10.6	5.7	32.5	19.6	-	-	-	0.91	0.85	0.97	0.95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Z ⁽⁷⁾	≈5	CHC	S	S	S	-	-	-	-1.3	-	-	-	-	-	-	4.72	-	-	-	-	-	-	23.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AB	3	SC	S	S	S	S	-	-	-	-	-	-	5.7	-	-	-	-	-	-	0.85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AD	>10	SC	S	M,L	L	S	S	-	-	-	5.3	6.6	-	-	-	-	-	0.84	0.86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- (1) S-Small (<10 Pass); M-Medium (10-19 Pass); L-Large (>19 Pass)
 (2) S-Small (0-5 A/C); M-Medium (5-10 A/C); L-Large (>10 A/C)
 (3) S-Small (<50,000); M-Medium (50,000-150,000); L-Large (>150,000)
 (4) Ownership: PR-Private; CHC-Closely Held Corp.; P-Partnership; PC-Public Corp.; SC-Subsidiary Corp.
 (5) S-Small (<500,000 lbs); M-Medium (500,000-5 million lbs); L-Large (>5 million lbs)
 (6) S-Small (<150,000 lbs); M-Medium (150,000-800,000 lbs); L-Large (>800,000 lbs)
 (7) Currently Out of Business
 (8) NA-Not Avail

TABLE XVIII. FINANCIAL RATIO COMPARISON (Continued)

FINANCIAL RATIO										DEBT SERVICE COVERAGE										OPERATING COST RATIO										CURRENT RATIO									
TRADITIONAL FINANCIAL STANDARDS WITHOUT FEDERAL GUARANTEE										MG. 1.35 (minimum) G. 1.25 (minimum)										MG. 0.75 (maximum) G. 0.90 (maximum)										MG. 1.00 (minimum) G. 1.00 (minimum)									
CARRIER	YRS IN COMMERCE BUSINESS	OWNER- SHIP ⁽⁴⁾	CHARACTERISTICS (CY 1979)				ANNUAL MAIL ⁽⁶⁾	1973	1974	1975	1976	1977	1978	1979	1973	1974	1975	1976	1977	1978	1979	1973	1974	1975	1976	1977	1978	1979	1973	1974	1975	1976	1977	1978	1979				
			FLEET SIZE ⁽²⁾	AIRCRAFT SIZE ⁽¹⁾	ANNUAL PAS ⁽³⁾	ANNUAL CARGO ⁽⁵⁾																																	
P	>10	S	S	M	S	-	-6.2	-12.00	-	-	-	-	-	-	1.00	1.68	-	-	-	1.27	-	0.31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Q	≈3	P	S	S	S	-	-	-	-	-	-	-	-	-	-	-	4.01	1.72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
R	4	CNC	S	S,M	S	S	-	-	-	-	-0.39	0.82	0.51	0.16	-	-	-	1.51	1.11	0.92	0.82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S	3	SC	S	M	S	-	-	-	-	-	-	0.96	0.85	0.56	-	-	-	-	-	0.89	0.80	0.97	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
T	8	CNC	S	S,M	S	S	L	-	-	0.47	-	-	-	-	0.92	-	-	-	-	-	-	1.41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
V	9	CNC	S	S	S	S	-	-	-	-	-	-	-	-	-	-	-	-	-	0.95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
W ⁽⁷⁾	>7	CNC	S	S	S	S	M	-	0.67	1.26	2.45	-	-	-	-	1.07	0.88	0.98	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
X	>5	CNC	S	M	M	S	S	-	-	-	-	-	0.84	0.92	-	-	-	0.86	0.86	0.95	0.90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Y	8	CNC	S	M	M	S	-	-	-	-	1.05	1.19	0.57	-0.15	-	-	-	0.82	0.86	1.05	1.29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Z ⁽⁷⁾	≈5	CNC	S	S	S	-	-	-	-0.63	-0.45	-2.60	-	-	-	1.44	-	-	-	-	-	-	0.37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
AB	3	SC	S	S	S	S	-	-	-	-	-	0.81	-	-	-	-	-	-	-	0.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
AD	>10	SC	S	M,L	L	S	S	-	-	-0.86	0.53	-	-	-	-	-	0.88	0.87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

(1) S-Small (<10 Pass); M-Medium (10-19 Pass); L-Large (>19 Pass)
 (2) S-Small 40-5 A/C; M-Medium 45-10 A/C; L-Large (>10 A/C)
 (3) S-Small (<50,000); M-Medium 50,000-150,000; L-Large (>150,000)
 (4) Ownership: PR-Private; CNC-Closely Held Corp.; P-Partnership; PC-Public Corp.; SC-Subsidiary Corp
 (5) S-Small (<500,000 lbs); M-Medium 500,000-5 Million lbs; L-Large (>5 Million lbs)
 (6) S-Small (<150,000 lbs); M-Medium 150,000-800,000 lbs; L-Large (>800,000 lbs)
 (7) Currently Out of Business
 (8) Not Available

This table indicates that there are significant variations in financial ratios from year to year and carrier to carrier. In general, there does not appear to be any trend or pattern that could relate "good" or "bad" ratios to any particular ownership, traffic characteristic, or years in business. Referring to Table XVIII, the large fleet-size carriers had, for example, debt/equity ratios as low as 0.38 and as high as 46. A number also showed negative equity standing. The related debt ratios ranged from a low of 27% to a high of 372%. In the area of long term debt/asset ratios, large fleet carriers varied from 0.13 to 4.81. Debt service coverage varied from negative values to 12.50. Operating cost ratios varied from a low of .76 to a high of 1.16. Finally, current ratios varied from a low of 0.05 to as high as 2.21. Medium and small fleet size carriers showed the same wide variations with wide variances apparently independent of fleet, aircraft size, ownership or traffic characteristics.

To further illustrate these ratios in comparison with industry desired standards, Tables XIX and XX were prepared. These tables were used to illustrate two facets of financial viability. The first was whether or not the relaxed evaluation standards granted by the financial industry if Federal guarantees are available made any difference as to number of qualifying carriers when compared with the slightly more strict standards stated where Federal guarantees were not available. The second purpose of this table was to assess the total number of carriers for which data were available that could meet the financial ratio standards. Table XIX identifies the carriers in each fleet-size category for the years that data were available that could meet the desired financial ratio value both with and without a Federally guaranteed loan. The table further compares the number of carriers that meet these criteria of the total for which data were available. Table XX provides various totals to allow better comparisons by fleet size category. Tables XIX and XX show relatively high percentages of the carriers were able to meet the debt/equity or debt ratio criteria. Forty-four percent of those carriers shown on the table were able to meet the non-loan guaranteed numerical ratio criteria. With a Federal guarantee and the attendant relaxed standards, 52% would have qualified. Similarly, a number of carriers were able to qualify

TABLE XIX. CARRIER DATA POINTS MEETING FINANCIAL RATIO STANDARDS

RATIO	DEBT/EQUITY					DEBT RATIO					LTD / ASSET												
	NC (2) G (3)	1974	1975	1976	1977	NC (2) G (3)	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	
DESIRED VALUE(1)																							
YEAR																							
LARGE FLEET SIZE CARRIERS (15-30 aircraft)																							
# MEETING NC		0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
# MEETING G		0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DIFFERENCE		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MEDIUM FLEET SIZE CARRIERS (10-15 aircraft)																							
# MEETING NC		0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
# MEETING G		0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DIFFERENCE		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SMALL FLEET SIZE CARRIERS (1-5 aircraft)																							
# MEETING NC		0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
# MEETING G		0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DIFFERENCE		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL NC		1	0	5	4	0	5	6	0	3	2	0	3	2	0	3	1	0	3	2	0	5	2
G		1	0	5	4	0	5	6	0	3	2	0	3	1	0	3	1	0	3	2	0	5	2
DIFFERENCE		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(1) Value preferred by financial institutions
(2) NC - Desired value without federal guarantee available
G - Allowable value with federal guarantee available

TABLE XIX. CARRIER DATA POINTS MEETING FINANCIAL RATIO STANDARDS (Continued)

RATIO	DEBT SERVICE COVERAGE										OPERATING COST RATIO										CURRENT RATIO									
	NG: 1.35 (minimum) G: 1.25 (minimum)										NG: 0.75 (maximum) G: 0.50 (maximum)										NG: 1.00 (minimum) G: 1.00 (minimum)									
DESIGNED VALUE ⁽¹⁾	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
LARGE FLEET SIZE CARRIERS (1-10 aircraft)																														
# MEETING NG	-	1 OF 2	3 OF 6	3 OF 5	4 OF 6	5 OF 6	2 OF 4	0 OF 1	1 OF 2	2 OF 6	0 OF 1	1 OF 2	2 OF 6	0 OF 5	0 OF 6	0 OF 7	0 OF 5	0 OF 6	1 OF 2	2 OF 6	0 OF 5	1 OF 2	1 OF 2	2 OF 5	4 OF 6	4 OF 7	3 OF 5	3 OF 5	3 OF 5	
# MEETING G	-	2 OF 2	3 OF 6	3 OF 5	4 OF 6	5 OF 6	2 OF 4	0 OF 1	1 OF 2	2 OF 6	0 OF 1	1 OF 2	2 OF 6	2 OF 5	2 OF 6	2 OF 7	2 OF 5	2 OF 6	2 OF 6	2 OF 6	1 OF 2	1 OF 2	1 OF 2	2 OF 5	4 OF 6	4 OF 7	3 OF 5	3 OF 5	3 OF 5	
DIFFERENCE	-	1	0	0	0	0	0	0	1	2	0	1	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	
MEDIUM FLEET SIZE CARRIERS (5-10 aircraft)																														
# MEETING NG	-	0 OF 1	1 OF 2	1 OF 2	2 OF 2	2 OF 4	-	0 OF 1	1 OF 2	2 OF 2	0 OF 1	1 OF 2	2 OF 6	0 OF 2	0 OF 2	0 OF 3	0 OF 2	1 OF 2	1 OF 2	1 OF 2	0 OF 2	1 OF 2	1 OF 2	2 OF 3	2 OF 3	3 OF 5	1 OF 2	1 OF 2	1 OF 2	
# MEETING G	-	0 OF 1	1 OF 2	1 OF 2	2 OF 2	2 OF 4	-	0 OF 1	1 OF 2	2 OF 2	0 OF 1	1 OF 2	2 OF 6	0 OF 2	0 OF 2	0 OF 3	0 OF 2	1 OF 2	1 OF 2	1 OF 2	0 OF 2	1 OF 2	1 OF 2	2 OF 3	2 OF 3	3 OF 5	1 OF 2	1 OF 2	1 OF 2	
DIFFERENCE	-	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
SMALL FLEET SIZE CARRIERS (1-5 aircraft)																														
# MEETING NG	-	0 OF 3	3 OF 4	1 OF 5	0 OF 4	0 OF 4	0 OF 4	0 OF 4	0 OF 3	0 OF 4	0 OF 3	0 OF 4	0 OF 2	0 OF 6	1 OF 5	0 OF 6	0 OF 4	1 OF 2	1 OF 2	1 OF 2	0 OF 4	1 OF 2	1 OF 3	4 OF 7	2 OF 5	3 OF 6	3 OF 4	3 OF 4	3 OF 4	
# MEETING G	-	0 OF 3	3 OF 4	1 OF 5	0 OF 4	0 OF 4	0 OF 4	0 OF 4	0 OF 3	0 OF 4	0 OF 3	0 OF 4	0 OF 2	0 OF 6	4 OF 5	1 OF 6	2 OF 4	1 OF 2	1 OF 2	1 OF 2	0 OF 4	1 OF 2	1 OF 3	4 OF 7	2 OF 5	3 OF 6	3 OF 4	3 OF 4	3 OF 4	
DIFFERENCE	-	0	1	0	0	0	0	0	0	0	0	0	1	3	3	1	2	2	2	2	0	0	0	0	0	0	0	0	0	
TOTAL NG	-	1 OF 6	4 OF 12	5 OF 12	6 OF 12	2 OF 14	2 OF 8	0 OF 5	1 OF 5	2 OF 10	0 OF 5	1 OF 5	2 OF 10	0 OF 13	1 OF 12	0 OF 16	0 OF 11	0 OF 5	0 OF 5	0 OF 5	0 OF 5	0 OF 5	0 OF 5	4 OF 12	8 OF 15	8 OF 14	10 OF 18	7 OF 11	7 OF 11	
G	-	2 OF 6	5 OF 12	5 OF 12	6 OF 12	2 OF 14	2 OF 8	0 OF 5	1 OF 5	2 OF 10	0 OF 5	1 OF 5	2 OF 10	0 OF 13	1 OF 12	0 OF 16	4 OF 11	0 OF 5	0 OF 5	0 OF 5	0 OF 5	0 OF 5	0 OF 5	4 OF 12	8 OF 15	8 OF 14	10 OF 18	7 OF 11	7 OF 11	
DIFFERENCE	-	0	0	0	0	0	0	0	0	0	0	0	1	5	5	5	4	4	4	4	0	0	0	0	0	0	0	0	0	

(1) Value preferred by financial institutions
(2) NG - Desired value without federal guarantee available
G - Allowable value with federal guarantee available

Table XX . CARRIER DATA POINTS MEETING FINANCIAL RATIO STANDARDS⁽¹⁾

(Selected Years: 1973-1979)

	Debt/Equity or Debt Ratio		LTD/Asset		Debt Service Coverage		Operating Cost Ratio		Current Ratio	
	# Meeting Standard	%	# Meeting Standard	%	# Meeting Standard	%	# Meeting Standard	%	# Meeting Standard	%
o Federally Guaranteed Loan Financial Ratio Standards										
o Large Fleet Size Carriers	18 of 33	55	23 of 33	70	19 of 29	66	11 of 32	34	17 of 33	52
o Medium Fleet Size Carriers	14 of 18	78	14 of 15	93	6 of 11	55	3 of 13	23	11 of 17	65
o Small Fleet Size Carriers	10 of 30	33	17 of 29	59	2 of 24	8	11 of 28	39	15 of 30	50
Total	42 of 81	52	54 of 77	70	27 of 64	42	25 of 73	34	43 of 80	54
o Non-Federally Guaranteed Loan Financial Ratio Standards										
o Large Fleet Size Carriers	17 of 33	52	21 of 33	64	18 of 29	62	1 of 32	3	17 of 33	52
o Medium Fleet Size Carriers	11 of 18	61	13 of 15	87	6 of 11	55	1 of 13	8	11 of 17	65
o Small Fleet Size Carriers	8 of 30	27	11 of 29	38	1 of 24	4	1 of 28	4	15 of 30	50
Total	36 of 81	44	45 of 77	58	25 of 64	39	3 of 74	4	43 of 80	54

(1) Data points obtained for 30 carriers for varied numbers of years between 1973-1979.

insofar as the long term debt to asset ratio and current ratio are concerned. In the former, 58% would meet the nonguaranteed criteria and 70% the guaranteed criteria. In the case of the latter, 54% of the carriers for which data were available would meet the standards. In terms of debt service coverage and operating cost ratio, significantly less of the carriers showed a history of meeting the desired values. Only 39% could meet the nonguaranteed loan debt service coverage standards with 42% meeting the guaranteed loan criteria. As expected, carriers with larger fleets showed a better ability to meet the debt service criteria but very few of the small carriers qualified. Only four percent of all size carriers could meet the nonguaranteed operating cost ratio criteria with 34% meeting the guaranteed desired values. In many cases, the medium fleet size carriers showed a better capability to meet the desired standards.

2. FACTORS CONTRIBUTING TO COMMUTER FAILURES

Specific information about reasons for commuter airline failures is either largely unavailable or reflects a composite of factors that are difficult to separate. Those carriers that have experienced the most serious problems are usually unavailable (or unwilling) to discuss their problems in detail or are largely unaware of the real problems as they would have otherwise corrected them prior to business failure. However, in the course of the carrier interviews as well as information provided in Reference 3, some information was obtained as to typical problems associated with the industry as summarized in the following paragraphs.

a. Undercapitalization

Many observers pointed out a tendency by commuter air carrier operators to underestimate the capital requirements in this extremely capital intensive industry. Many of the operators starting a business were involved in fixed based operations, pilot training, etc., but were unfamiliar with the true cost of acquiring and operating larger commuter class aircraft in scheduled service. Many also underestimated start up costs and found themselves in an extremely poor cash flow position with insufficient capital to weather the "lean years" while passenger demand was building. One-time start up costs alone (as reflected in Reference 3 and adjusted for 10% inflation) can involve expenditures of \$14,000 to \$70,000 the first year.

b. Management Capability

There is a "tongue-in-cheek" saying in the industry that the worst person to own a commuter airline is a pilot. Although familiar with, and quite expert in, the operational aspects of the business, some are not trained as businessmen. A successful business will demand prudent judgment in terms of capital acquisition, aircraft choice, expansion, debt management, realistic marketing analysis, etc., which is often overshadowed by an operator's desire to run a "larger" airline.

c. Market Analysis

Most operators do not have sophisticated capabilities to analyze potential markets. Although many prudently work with travel agents, transportation and planning agencies, etc., others will institute expensive service without the benefit of a comprehensive market assessment. This trend is often combined with a tendency to remain too long in an unprofitable market under the erroneous assumption that patronage is building.

d. Proper Aircraft Selection

In some cases, new operators will tend to use a high operating cost, relatively low seating density aircraft because it is currently owned rather than because it is suitable for daily commuter service. On the other end of the spectrum, many established operators, stricken with the large airline syndrome, will tend to acquire an aircraft too large for the market. Enjoying large load factors with small aircraft, the operator may have a tendency to too quickly institute a much larger aircraft at the expense of service frequency. As travel demand is heavily influenced by frequency, he will find himself with higher costs and fewer passengers due to inability to meet travelers' desired departure times. Another associated pitfall is a tendency to project costs based solely on manufacturer's operating cost estimates. A number of operators pointed out that such estimates are often unrealistically optimistic.

e. Inability to Grow

Another problem pointed out was the inability of some carriers to respond to expansion demand. This response failure can be due to a number of factors

including the inability of management to recognize the need, the inability to obtain required financial support, or the inability (or unwillingness) to intuitively bridge the "mom and pop" gap and expand into a larger business. In some cases other operational factors enter into this inability to grow. These may include inability to obtain proper aircraft, lack of appropriate airport space at a served hub (or high cost thereof), inability to obtain and train appropriate pilot and maintenance personnel, limited access to proper maintenance facilities.

f. Competition

A continual problem facing a commuter carrier is the open route competition that exists. As no route protection is afforded through the regulatory process, a commuter can find himself expending considerable effort and finances to build an appropriate market and then have other carriers enter the same market. In cases where the market demand cannot effectively support more than one carrier, both carriers will often find themselves in financial trouble.

3. REPLACEMENT SERVICE HISTORY

One aspect of this task was to assess the results of commuter air carriers replacing certificated air carrier service at suspended or deleted points. Since 1967, CAB records show some 47 communities have had certificated carrier service suspended in favor of commuter replacement service. Further, some 71 communities have had certificated service formally deleted with 31 of these points served by commuter replacement service in 1977. Suspended points are those at which a certificated carrier may be required to reinstate service if replacement service does not prove viable. Deleted points are those which a certificated carrier is permitted to remove its route certificate and has no further obligation to serve. Reference 4 indicates that certificated carriers have filed for complete service suspension at an additional 24 points under the new Airline Deregulation Act of 1978 as of March 1979. An additional 13 communities have actually lost air service since March 1978 with hearings continuing for many of these points to solicit either replacement service or reinstitute certificated air carrier service. With commuter carriers expected to fill any gap in small community service, the historical performance of such

replacement service is clearly of interest. The major focus of the assessment was thus on historical "before and after" traffic statistics at typical replacement markets. Accordingly, summary data were obtained from the CAB's Office of Community and Congressional Relations to examine typical market responses to commuter service. Although somewhat dated, that data are considered sufficient to illustrate typical responses.

Table XXI summarizes the record of commuter carrier replacements in suspended markets. The table identifies the suspended point, the year of suspension, the certificated air carrier enplanements for the year prior to suspension, and the corresponding commuter enplanements in 1976. As can be seen from this table, 37 of the 47 replacement markets showed significant increases in patronage with an average annual growth rate through 1976 of 19.52 percent.

Table XXI also indicates whether financial underwriting was available to the commuter replacement carrier. In those markets where underwriting was available, it was principally limited to a guarantee of "break-even" for the first two-year period by the replaced certificated air carrier.

Tables XXII and XXIII similarly identify traffic data for markets which were deleted as certificated points by the CAB since 1967. As of July 1977, 31 of these markets were served by commuter air carriers (Table XXII) with many also enjoying significant increases in patronage (although these increases were not as prevalent or dramatic when compared to suspended point replacement service). As summarized on Table XXIII, as of July 1977, 41 of the deleted certificated points were unserved as far as scheduled air service is concerned. A few of these currently unserved markets did receive some attempt by commuters to serve them with the table reflecting the last year of available traffic data and the number of enplaned passengers for that year. As can be seen, however, most of the carriers attempting to serve these 41 points exhibited significantly fewer passengers than the previous certificated air carriers.

In summary, it is clear that many of the suspended and deleted points can be economically served by commuter air carriers. Further, in view of the subsidy now available under the essential air service provisions of the Airline Deregulation Act of 1978, it is anticipated that even more of these communities could now receive scheduled air service.

TABLE XXI. TRAFFIC RESPONSE TO COMMUTER AIR CARRIER REPLACEMENT SERVICE

<u>Community</u>	<u>Date of Cert. Carrier Suspension</u>	<u>Enplanements For Year Prior to Suspension</u>	<u>Commuter Enplanements For 1976</u>	<u>Enplanements Avg. Annual Rate of Growth thru 1976</u>	<u>Financial Underwriting</u>
Altoona, PA	9-15-71	14,273	20,499	6.22	Yes
Atlantic City, NJ	9-8-70	14,766	28,405	9.80	Yes
Bloomington, IN	4-29-73	2,985	17,129	54.77	Yes
Cape May, NJ	7-12-70	1,346	6,862	26.20	Yes
Clearfield- Phillipsburg-Bellefonte- State College, PA	10-1-73	16,159	25,149	11.69	Yes
Clinton, IA	10-26-75	4,868	5,862	9.74	No
Danville, IL	10-7-68	7,179	13,822	7.55	Yes
Dodge City, KS	10-27-68	963	2,963	13.30	Yes
Dubois, PA	3-10-69	4,594	14,625	15.57	Yes
Elkins, WV	9-15-69	2,318	3,384	4.84	Yes
Glens Falls, NY	12-1-75	652	585	(5.28)	Yes
Great Bend, KS	10-1-70	2,941	2,355	(3.12)	Yes

TABLE XXI. TRAFFIC RESPONSE TO COMMUTER AIR CARRIER REPLACEMENT SERVICE (Continued)

<u>Community</u>	<u>Date of Cert. Carrier Suspension</u>	<u>Enplanements For Year Prior to Suspension</u>	<u>Commuter Enplanements For 1976</u>	<u>Enplanements Avg. Annual Rate of Growth thru 1976</u>	<u>Financial Underwriting</u>
Hagerstown, MD	11-15-67	2,617	18,845	21.83	Yes
Haines, AL	6-27-74	1,210	1,201	(.25)	No
Hana, HA	6-15-73	2,591	9,533	38.50	No
Hazleton, PA	7-22-68	3,090	1,474	(7.90)	Yes
Hutchinson, KS	10-1-70	3,322	883	(17.24)	Yes
Jamestown, NY	8-1-74	14,291	27,747	24.75	Yes
Johnstown, PA	4-26-70	9,068	22,393	13.79	Yes
Jonesboro, AR	2-13-76	2,569	7,638	197.31	No
Kenai, AL	12-26-73	5,454	56,325	79.27	No
Key West, FL	2-1-71	8,791	47,403	32.42	No
Kingman, AR	5-1-75	690	524	(12.86)	No
Kirksville, MO	4-25-76	2,104	3,517	67.16	No
Lancaster, PA	11-1-68	17,712	30,096	6.07	No
Mansfield, OH	7-1-69	2,194	9,704	17.96	No

TABLE XXI. TRAFFIC RESPONSE TO COMMUTER AIR CARRIER REPLACEMENT SERVICE (Continued)

<u>Community</u>	<u>Date of Cert. Carrier Suspension</u>	<u>Enplanements For Year Prior to Suspension</u>	<u>Commuter Enplanements For 1976</u>	<u>Enplanements Avg. Annual Rate of Growth thru 1976</u>	<u>Financial Underwriting</u>
Massena, NY	2-28-70	7,329	4,246	(6.60)	No
Muncie-Anderson- New Castle, IN	3-5-71	6,672	14,539	13.86	Yes
Natchez, MS	3-1-75	3,513	3,074	(6.46)	Yes
New London-Groton, CT	10-1-73	20,432	48,025	23.82	No
Ogdensburg, NY	2-28-70	2,537	3,677	5.44	No
Oil City-Franklin, PA	12-2-69	4,944	9,823	8.96	No
Owensboro, KY	9-1-75	6,675	4,098	(21.65)	No
Plattsburgh, NY	1-7-74	4,444	10,316	32.41	No
Pullman, WA-Moscow, IN	12-3-74	9,157	13,203	12.97	No
Reading, PA	3-1-73	9,696	33,230	36.06	No
Rutland, VT	2-28-70	1,616	2,144	4.12	No
Salisbury, MD	6-1-69	6,257	36,138	24.51	Yes
Saranac-Lake Placid, NY	1-7-74	1,445	4,313	43.98	No
Skagway, AL	6-27-74	2,834	2,369	(5.93)	No

TABLE XXI. TRAFFIC RESPONSE TO COMMUTER AIR CARRIER REPLACEMENT SERVICE (Continued)

<u>Community</u>	<u>Date of Cert. Carrier Suspension</u>	<u>Enplanements For Year Prior to Suspension</u>	<u>Commuter Enplanements For 1976</u>	<u>Enplanements</u>		<u>Financial Underwriting</u>
				<u>Avg. Annual Rate of Growth thru 1976</u>	<u>1976</u>	
Terre Haute, IN	6-1-73	14,057	25,394	15.93		Yes
Trenton, NJ	4-1-72	3,684	28,786	50.86		No
Victoria, TX	2-15-73	6,552	8,140	5.57		No
Walla Walla, WA	12-13-74	7,505	13,046	20.24		No
Watertown, NY	1-7-74	3,707	5,822	16.24		No
Wenatchee, WA	8-1-74	5,157	9,527	22.70		No
Winona, MN	11-1-69	3,601	1,748	8.64		No
TOTAL		280,561	660,571	19.52		

TABLE XXII. CERTIFIED POINTS DELETED SINCE JANUARY 1979 WITH SCHEDULED SERVICE AS OF JULY 1977

<u>Date Deleted</u>	<u>City, State</u>	<u>Last Certified Service</u>		<u>Scheduled Service 7/77</u>	<u>Previous Carrier Service</u>	
		<u>Year</u>	<u>Enplaned Passengers</u>		<u>Year of Operational Data</u>	<u>Enplaned Passengers</u>
3-2-67	Lawrence, MA	CY 1964	27	Commuter	No service reported prior to present operations	
3-2-67	Newport, RI			Commuter	CY 1975	4,586
3-6-67	Lakeview, OR	CY 1966	133	Commuter	FY 1974	Cargo
3-6-67	Burns, OR	CY 1966	181	Commuter	FY 1974	Cargo
8-21-67	Port Angeles, WA	FY 1967	619	Commuter	CY 1975	4,396
10-26-69	Wisc. Rapids Stevens Point, WI	FY 1969	19,973	Commuter	CY 1974	9,675
8-30-70	Sedalia, MO	Service never inaugurated		Commuter	CY 1974	208
12-27-70	Marysville-Yuba City, CA	FY 1970	796	Commuter	CY 1975	144
4-12-72	Liberty-Monticello, NY	FY 1970	3,491	Commuter	FY 1973	156 (Est.)
6-20-72	S. Pines-Pinehurst-Aberdeen, NC	FY 1972	1,105	Commuter	CY 1975	443
9-11-72	Bowling Green, KY	FY 1969	6,200	Commuter	CY 1975	912
12-15-72	Galveston, TX	FY 1972	6,676	Commuter	CY 1975	8,529
1-21-72	Ocala, FL	CY 1971	1,460	Commuter	CY 1975	2,258
4-30-73	Baker, OR	CY 1972	377	Commuter	CY 1975	1,821

TABLE XXII. CERTIFIED POINTS DELETED SINCE JANUARY 1979
WITH SCHEDULED SERVICE AS OF JULY 1977 (Continued)

Date Deleted	City, State	Last Certificated Service		Scheduled Service 7/77	Previous Commuter Carrier Service	
		Year	Enplaned Passengers		Year of Operational Data	Enplaned Passengers
4-30-73	Ontario, OR-Payette, ID	CY 1972	176	Commuter	FY 1974	N/A
4-30-73	Roseburg, OR	CY 1972	297	Commuter	FY 1975	Cargo
5-20-73	College Station, TX	CY 1972	4,261	Commuter	CY 1975	17,237
10-11-73	Olympia, WA	FY 1973	382	Commuter	CY 1975	369
10-11-73	San Luis Obispo, Paso Robles, CA	FY 1973	4,793	Commuter	CY 1975	24,089
11-9-73	Poughkeepsie, NY	CY 1969	1,243	Commuter	CY 1975	29,658
10-28-73	Inyokern, CA	FY 1973		Commuter	CY 1975	5,658
12-5-74	Battlecreek, MI	FY 1970	33,221	Commuter	CY 1975	18,948
7-18-74	Aberdeen-Hoquiam, WA	CY 1973	905	Commuter	CY 1975	85
11-14-74	Wilmington, DE	FY 1974	8,074	Commuter	CY 1975	6,362
6-15-74	Lake Tahoe, CA	FY 1974	2,380	Commuter, Intrastate		
1-1-75	Lacopia, NH	CY 1968	254	Commuter	CY 1975	4,029
5-5-75	Lafayette, IN	FY 1975	4,164	Commuter	CY 1975	21,211
5-27-75	Lufkin, TX	FY 1975	1,500	Commuter		
10-17-75	Pine Bluff, AR	FY 1974	3,578	Commuter	CY 1975	932
11-20-76	Moab, UT	FY 1974	1,111	Commuter	CY 1975	1,546

TABLE XXIII. CERTIFIED POINTS DELETED SINCE JANUARY 1967
WITH NO SCHEDULE AIR SERVICE AS OF JULY 1977

Date Deleted	City, State	Last Certificated Service		Previous Commuter Carrier Service Through CY 1975	
		Year	Enplaned Passengers	Last Year of Operational Reported Data	Enplaned Passengers
3-2-67	Millinocket, ME	FY 1953	NA	None	
7-3-67	Coeur d'Alene, ID	FY 1967	1,806	CY 1970	271
4-21-69	Moberly, MO	CY 1968	663	CY 1971	51
8-9-71	Portsmouth, OH	FY 1971	271	None	
8-30-70	Vicksburg, MS	FY 1970	900	CY 1972	53
10-18-71	Martinsburg, WV	FY 1970	1,128	CY 1971	536
3-3-72	Land O'Lakes, WI	CY 1968	1,027	None	
3-7-72	Rome, GA	CY 1968	1,063	CY 1971	374
4-13-72	Blacksburg-Radford-Pulaski, VA	CY 1971	1,555	CY 1975	560
6-12-72	Waycross, GA	CY 1968	3,239	CY 1975	169
6-20-72	Elizabeth City, NC	CY 1971	2,278	CY 1975	607
8-7-72	Duncan, OK	FY 1972	1,954	CY 1973	227
11-27-72	Wheeling, WV	CY 1969	2,545	CY 1970	1,207
11-27-72	Marion, IN	FY 1969	1,867	FY 1969	1,867

TABLE XXIII. CERTIFIED POINTS DELETED SINCE JANUARY 1967

WITH NO SCHEDULE AIR SERVICE AS OF JULY 1977 (Continued)

Date Deleted	City, State	Last Certificated Service		Previous Commuter Carrier Service Through CY 1975	
		Year	Enplaned Passengers	Last Year of Operational Reported Data	Enplaned Passengers
1-3-73	Vero Beach, FL	CY 1972	4,191	CY 1975	1,585
1-29-73	Pascagoula, MS	CY 1972	1,201	CY 1971	3
5-7-73	Lawrenceville-Vincennes, IL	CY 1969	1,067	None	
12-10-73	Apple Valley, CA	FY 1973	2,320	None	
6-3-74	Bartlesville, OK	CY 1973	1,649	CY 1974	Cargo Only
7-1-74	Hattiesburg, MS	CY 1973	3,467	CY 1971	35
7-11-74	Crossville, TN	CY 1973	344	None	
8-26-74	Olean, NY	CY 1971	115	None	
9-9-74	Kennedy Space Center, FL	FY 1974	3,641	None	
10-4-74	Anderson, SC	FY 1974	3,610	CY 1975	821
10-4-74	Greenwood, SC	FY 1974	2,862	CY 1975	1,214
10-4-74	Lima, OH	CY 1972	2,663	CY 1974	191
12-5-74	Burley/Rupert, ID	CY 1969	546	CY 1973	337
12-5-74	Douglas, AR	FY 1964	2,281	CY 1975	80
9-20-74	Shelbyville/Tallahoma, TN	FY 1974	448	None	
1-5-75	Muskogee, OK	FY 1974	643	CY 1975	Cargo Only

TABLE XXIII. CERTIFIED POINTS DELETED SINCE JANUARY 1967
WITH NO SCHEDULE AIR SERVICE AS OF JULY 1977 (Continued)

<u>Date Deleted</u>	<u>City, State</u>	<u>Last Certificated Service</u>		<u>Previous Commuter Carrier Service Through CY 1975</u>	
		<u>Year</u>	<u>Enplaned Passengers</u>	<u>Last Year of Operational Reported Data</u>	<u>Enplaned Passengers</u>
1-7-75	Boulder City, CO	FY 1949	NA	None	
1-1-75	Brunswick, ME	FY 1950	NA	None	
1-1-75	Whitefield, NH	Service Never Inaugurated		CY 1975	92
1-1-75	Berlin, NH	FY 1967	343	CY 1974	179
1-1-75	Portsmouth, NH	FY 1952	NA	None	
1-1-75	Newport, VT	CY 1968	407	CY 1974	15
2-14-75	Big Spring, TX	CY 1974	2,414	None	
4-4-75	Sandusky, OH	Service Never Inaugurated		None	
11-5-75	Goldsboro, NC	CY 1974	6,737	None	
9-1-76	Borger, TX	CY 1969	1,076	None	
9-1-76	St. Joseph, MO	CY 1969	1,708	None	

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3. "Oregon Commuter Air Service Project," The Aerospace Corporation, May 1975.
4. "Department of Transportation and Related Agencies Appropriations for 1980," Subcommittee Hearings, PART 6 USGPO, 1979.

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