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# **AIR SERVICE TO SMALL COMMUNITIES DIRECTIONS FOR THE FUTURE**

FINAL REPORT OF THE WORKSHOP ON LOW/MEDIUM  
DENSITY AIR TRANSPORTATION

Joseph F. Vittek, Jr.  
Editor

**FLIGHT TRANSPORTATION LABORATORY**

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**M.I.T. FLIGHT TRANSPORTATION LABORATORY**

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Edited by  
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# EXECUTIVE SUMMARY

In the decade between 1962 and 1972, certificated air service was deleted at about 250 points in the United States. In some of these cases, the service was no longer needed because of improved highway access to communities of interest. In other cases, the rapidly emerging commuter carrier industry replaced certificated carriers at marginal points. However, in many cases, the cities were left without adequate transportation. In addition, many cities that have never received air service now face a similar plight.

The federal government, through the creation of the local service air carriers in the mid-1940s and their subsequent subsidy, has attempted to provide better air service to the nation's smaller towns. But the questions persist. Is the federal subsidy program effective? Should federal regulation and/or subsidy be extended to commuter carriers? Indeed, should the federal government subsidize this type of service at all? What national goals does subsidy support? Perhaps most important, who should be formulating the answers to these questions?

## The Workshop

In August, 1973, the Flight Transportation Laboratory of the Massachusetts Institute of Technology hosted a month-long seminar at Aspen, Colorado, on the problems of providing air service to low and medium density points. This Workshop was jointly sponsored by the National Aeronautics and Space Administration and the Department of Transportation. More than 175 participants, including 130 panelists and speakers, represented various interest groups and points of view.

Two predominant philosophical positions held by participants often led to conflict. In general, federal officials and academics favored policies that relied heavily on market forces. Government intervention was considered necessary only for limited specific purposes. In contrast, state, local and industry participants often relied on the public policy issue of a perceived need for service. Inability to provide that service indicated that the market was not working and government intervention was required. This dichotomy is frequently reflected in the difference between the majority and minority views.

The recommendations which resulted from the Workshop are documented in this report and, although not unanimous in all cases, they do represent the majority consensus. Significant comments and minority views are also presented, as is a concluding epilog written by the Workshop Director reflecting upon the overall impact of the Workshop and anticipated future results.

It is hoped that this discussion and the associated recommendations will provide valuable input to transportation planning at the national, state and local levels, particularly for low and medium density areas, and that the referenced agencies will accept them as constructive suggestions for further consideration.

## Summary of Recommendations and Comments

The issues raised at the Workshop were classified in four major topic areas: National Transportation Policy Issues, National Air Transportation Policy Issues, Low/Medium Density Air Transportation Policy Issues and Technology Issues. This report follows the same topical structure.

### NATIONAL TRANSPORTATION POLICY ISSUES

The first issues considered were broad policy concerns that affect all modes of transportation in all areas of the country. These have a direct impact on low/medium density markets even if not specifically addressing their problems. Although some Workshop participants felt that the current and often conflicting profusion of federal statutes, regulations and programs represented a Congressional policy of "non-policy," the majority felt that a clear national policy for transportation was needed and that the federal Department of Transportation had failed to provide leadership in formulating such a policy. Therefore, the Workshop recommended that

**The DOT should take an active, aggressive role in the formulation and coordination of integrated national transportation policy. In taking the lead in transportation planning and coordination, the DOT should consider modal economic efficiency (including all private and public**

**costs and benefits), modal energy requirements and consumer desires in formulating policy.**

The Workshop felt that a clear statement on subsidy should be included in this policy. Based on a conclusion that the rationale for present subsidy programs is often unclear and inconsistent and that the major benefit of these programs accrues more often to a particular area than to the nation as a whole, the Workshop recommended that

1. **Federal subsidies to transportation should be paid only when**
  - A. **There is a clear national policy that the subsidy payments encourage or support; or**
  - B. **The subsidies are limited experiments to demonstrate the potential of new concepts to the private market, which would take over implementation if the demonstration were successful.**
2. **This policy toward transportation subsidies should apply to all modes.**

Several comments were received on this recommendation, with two major thrusts:

1. Since the nation is made up of individuals who live in local areas, what benefits those individuals benefits the nation as a whole; and
2. There are specific national benefits that accrue to the nation as a whole from good local transportation systems (e.g. population dispersion).

The Workshop did not totally disagree with these comments. It supported improved

service to the nation's smaller communities, recommending that

**DOT, as part of its planning process, should attempt to strike a better balance between rural and urban transportation services.**

**The federal government should support state or regional demonstrations for improving transportation services to small communities.**

Several federal agencies responded that this was not appropriate for the federal government or, if it were, some other agency, not theirs, should be responsible.

The Workshop could not identify population dispersion as a clear national goal. Nor was it clear that federally subsidized transportation would actually disperse population, although better transportation might prevent further concentration. It was therefore recommended that

**The DOT, with other government agencies, should determine if in fact population dispersal is a valid national goal and how transportation aids or detracts from that goal.**

## **NATIONAL AIR TRANSPORTATION POLICY ISSUES**

Although again the issues are broader than low/medium density areas, there is a direct connection. The Workshop concentrated on the impact of national policy toward air transportation as it affects the three aviation segments that primarily serve the



smaller communities: general aviation, local service airlines and commuter carriers.

**General Aviation** General aviation provides basic transportation service to smaller communities although it is not “public transportation” in the usual sense. But because of poor data, its true costs and benefits were hard to quantify. Therefore, the Workshop recommended that

**The FAA and DOT should obtain better statistics on general aviation. The first step is to better coordinate existing data from various fragmentary sources. New data acquisition programs should then be initiated to provide missing information.**

The Workshop did agree in principle with the DOT Cost Allocation Study that some upward adjustment in general aviation’s contribution toward the cost of the air system was justified. The exact amount could not be determined until better statistics were available. The resulting recommendation was that

**The evidence seems strong, even with faulty statistics, that some upward adjustment of general aviation payments is in order. But this should be gradual in order to avoid unnecessary disruption of activities that rely on the present system.**

This was disputed by the Aircraft Owners and Pilots Association.

**Local Service Airlines** Although far from trunk status in terms of size or resources, the local service airlines have been moving in that direction over the last decade, deleting or reducing service at smaller communities. Their future success would seem to depend on continued expansion and growth, not on small city service. Through a series of route awards and policy changes, the CAB seems to have encouraged this transition. With all these factors in mind, the Workshop recommended that rather than fight this trend and force local service carriers to serve markets they no longer are suited to serve

**The CAB should announce a policy of allowing gradual expansion and evolution**

**of locals to trunk status as present excess capacity is absorbed with the concomitant elimination of local service subsidies and deletion of subsidized points.**

It was expected that commuter carriers would provide service to many of the towns deleted by local service carriers, although local subsidies might be needed to ensure a commuter’s success.

The major objection to this recommendation came not from the carriers but from the towns and unions. The Workshop felt both sources of objection could be quieted. Once the communities realized they might get better service from a commuter, they would approve. The incentive for the unions would be the long-term potential for higher salaries and status that would accompany gradual expansion into trunk markets and larger aircraft.

The biggest concern of all parties was perhaps not so much the transition, but that the transition be orderly.

**Commuter Carriers** Although the growth of this industry has been great over the past decade, it still faces many problems that must be resolved if it is to play a significant role in the nation’s air transportation system and particularly to improve service at small communities. Perhaps the major problem is the commuter’s unequal treatment by other members of the air community. Commuter schedules are not integrated with the certificated carriers in the Official Airline Guide. Tariffs are not published. Airports often relegate commuters to far corners of the field or terminal complex. Even government agencies classify commuters as “general aviation” for many purposes. Therefore, the Workshop recommended that

**The DOT, FAA and CAB should officially recognize and endorse commuters as a vital segment of air transportation not essentially different qualitatively from certificated air carriers. The federal agencies should impress these attitudes upon state, local and airport authorities as well as influence the certificated carriers to adopt more cooperative arrangements with commuters.**

**There should be a total and complete disassociation of commuters from general aviation and air taxis, including separate**

## **regulations where appropriate.**

The Workshop was impressed by the commuter industry's growth and felt that its freedom from regulation played an important part in that success. Able to enter markets, terminate service and set rates without costly regulatory proceedings, commuters have the flexibility to experiment and quickly respond to market conditions. Therefore, it was recommended that

### **The commuter industry should retain its unregulated free competition status.**

The CAB's right to exempt commuters is currently being challenged in the courts. In anticipation of a decision adverse to the Workshop's position, the recommendation also stated that

### **If regulation is forced upon the industry by the courts, Congress should enact specific legislation to exempt commuters from regulation or amend the Federal Aviation Act of 1958 to allow the CAB to insert conditions in commuter certificates that essentially retain the present Part 298 in another form.**

## **LOW/MEDIUM DENSITY AIR TRANSPORTATION POLICY ISSUES**

Perhaps the most controversial recommendation of the Workshop was that

### **Direct federal subsidy of air service to small communities should be eliminated and the responsibility for subsidizing air transportation, where necessary, should be delegated to the lowest governmental level capable of assessing the costs and benefits of the service.**

After discussing various rationales for transportation subsidy, the Workshop felt several justified the commitment of public resources. However, none justified the direct commitment of federal resources. Although there were some general benefits to small community air service that accrued at the national level, they were not different from benefits arising from many non-subsidized activities. The major recipients of the unique benefits of this air service were the residents of the area receiving the service. Therefore, in the view of the Workshop,

subsidy should be paid at the local, not federal, level (at local discretion, the use of federal revenue sharing funds would be appropriate).

Realizing that this would probably be unpopular and might not gain political acceptance, the Workshop felt that as an alternative, new forms of federal subsidy should be tried that would require local participation. As a goal of such a program, the Workshop recommended that

### **Under any new federal subsidy proposal, the government should concentrate on minimizing costs for a specified service level or maximizing service for a specified subsidy level.**

## **TECHNOLOGY ISSUES**

The final major topic area was technology. In general, it was felt that technology was not a major component of the solution to providing better service to small communities.

**Aircraft** The Workshop was asked whether the federal government should support the design and development of a new jet aircraft specifically designed for small community service. The Workshop found that such an aircraft would not be useful in the low density subsidized markets, but could improve local service carrier profitability in medium density markets. But since such markets are already profitable and receive good service, no justification for federal involvement was found. Other public policy concerns such as foreign trade and international leadership were raised to justify federal support of such an aircraft, but were not discussed in detail. Therefore, the Workshop recommended that

### **Although foreign trade and international leadership concerns might justify government subsidy of the design and development of a family of new small jet aircraft, such a program cannot be justified on domestic considerations alone.**

The major objection to this position was voiced by those who felt higher profits on medium density routes could offset subsidy need and that the resulting reduction in operating subsidies would justify the use of federal funds to support design and develop-

ment of the aircraft. The Workshop felt that, though this was true, such cross-subsidization could be achieved more efficiently by route awards or fare increases. The Workshop did endorse continued government-sponsored research that might be applicable to future aircraft. In particular, it was recommended that

**Studies are needed on “design-to-cost” engineering, new manufacturing techniques and new materials to stress low cost and reliability rather than high cost technology.**

**Air Traffic Control** As long as the use of the federal airway and navigation system was free, people wanted more of everything. Now there is a chance that user charges might be imposed and operators, particularly in low density areas, are questioning what is really needed. The fear expressed at the Workshop was that the complicated expensive ATC system designed for high traffic corridors would be imposed on low density areas and operators would have to pay for a system that far exceeds their needs. Therefore, the Workshop recommended that

**The FAA should not extend the full high density ATC system to low density points and it should drop services that users do not wish to support financially. The FAA should balance safety with cost effectiveness in low density areas.**

The Workshop did not intend that safety be compromised, but that safety dollars be spent where the highest return would be realized and that features not be added to the system that had little use in low density areas.

The potential use of new navigational techniques in low density areas was also explored and, though more research is needed, the Workshop recommended that

**The FAA should move to certificate VLF RNAV for IFR and DOT/TSC should continue research on DME/DME RNAV and VLF hybrids.**

**Operations at Larger Airports** Because of the short field capability of many commuter aircraft, they could potentially be separated from the regular traffic flow, increasing capacity at the airport and speeding up commuter operations thereby lowering car-

rier costs. The recommendation was that

**The FAA should develop separate approach procedures for large and small aircraft.**

An additional concern was the wake vortex hazard that may accompany the future generation of powered-lift STOL aircraft. It was recommended that

**The FAA should investigate the use of wake vortex size as a criteria for aircraft separation rather than weight or STOL capability or speed.**

**Operations at Smaller Airports** Presentations indicated that commuter carriers often experience worse ATC problems at small uncontrolled airports than at hubs. A lack of local procedures and interference between commuters operating IFR and general aviation operating VFR were the major causes of ATC delays. Even if local procedures were implemented, they would not be widely known and would thus create a hazard unless the information were widely distributed. Therefore, the Workshop recommended that

**ATC centers should initiate letters of agreement and local procedures at low density terminals and the FAA should publish local procedures in the Airman’s Information Manual.**

A final recommendation, applying equally to hubs and low density airports, was that

**The FAA and NASA, guided by NTSB statistical studies, should conduct additional research into the causes of approach and landing accidents.**

**Safety** A presentation made at the Workshop on military safety coordination pointed out the benefits of a similar civil program. The Workshop recommended that

**Congress should authorize \$3-5 million per year for a five-year period to initiate a joint civil coordinating group for aviation safety.**

This group would not supplant other agencies or their responsibilities, but would provide a focal point for formal information exchange and coordination to avoid duplica-



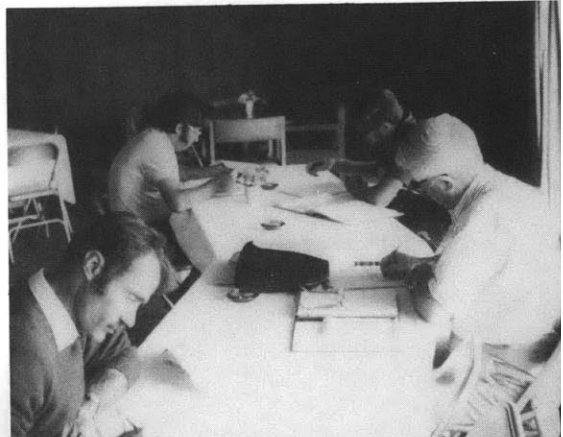
tion. In addition, it could recommend projects to participating agencies.

An example of how such a group could be used arose in the commuter safety area. No one actually knows what the commuter safety record is since it is statistically compiled in the same category as air taxis. Also, commuters do not have the resources of the large airlines to devote to safety. Therefore, the final recommendations of the Workshop were that

**The NTSB should initiate a program to improve published safety statistics on commuter airlines. NTSB should perform statistical research on accident causes in commuter airlines and the recommended joint civil coordinating group for aviation safety working with the NATC should assist the commuters with safety education, organization for safety and safety programs based on the NTSB results.**

## EPILOG

After the draft report was distributed for comments, many letters were received and discussions held with participants and other interested parties. Some recommendations were changed as a result. Some were not changed, but specific comments were noted. After viewing the Workshop itself and the post-Workshop review process, the Workshop Director has concluded that, although many of the Workshop's recommendations may eventually be implemented separately, the desired federal leadership for solving the problems of air service to small communities will not emerge without a Congressional mandate stimulated by state action. In the interim, states must be prepared to go forward on their own with a minimum of federal help and support.







## INTRODUCTION

In 1971, the joint Department of Transportation/National Aeronautics and Space Administration *Civil Aviation Research and Development Policy Study (CARD) Report* identified the problems of providing air service to low density, short-haul markets as the third most pressing difficulty facing the United States aviation industry. In the words of the report,

Low-Density Short-Haul: While lower in priority than noise and congestion, solutions to the problems of low-density, short-haul service will be important to the future of civil aviation and to its ability to contribute to the goals of the Nation. This service of civil aviation can be a positive force in future regional development. In order to obtain a better definition of the problems and potential of low-density, short-haul service, a program should be established to determine accurately market sensitivities to changes in service, fare, frequency, and equipment. A government-sponsored market demonstration is required for this purpose. Concurrent and integrated with this demonstration, the Government should fund studies for the conceptual design and analysis of economical vehicles for the low-density,

short-haul market (p. 2-6, emphasis added).

In response to this policy statement, NASA has undertaken a number of technical and systems studies as outlined by George W. Cherry, Deputy Associate Administrator for Aeronautics and Space Technology (Programs), in his 1972 testimony before the Subcommittee on Aeronautics and Space Technology of the U.S. House of Representatives Committee on Science and Astro-

nautics.

In FY 73, NASA programs relating specifically to low-density, short-haul will fall into three main categories:

a. Continuing an effort begun in FY 72 which is identifying technology problems associated with providing economical air service to sparsely-settled regions.

b. Continuing an effort begun in FY 72 which will investigate and develop very-low-frequency navigation techniques for en route and terminal area navigation for civil aviation, especially low-density, short-haul service.

c. Increasing knowledge of economic and operational factors which bear upon technology and aircraft requirements. Studies will be undertaken



to fit existing and hypothetical aircraft into realistic low-density, short-haul arenas and to identify where and why economic short-comings appear. Those that can be improved by technology will be identified. In addition, programs will be undertaken to investigate: ride-quality improvement as it influences aircraft design and passenger acceptance, crosswind landing characteristics, and operational techniques.

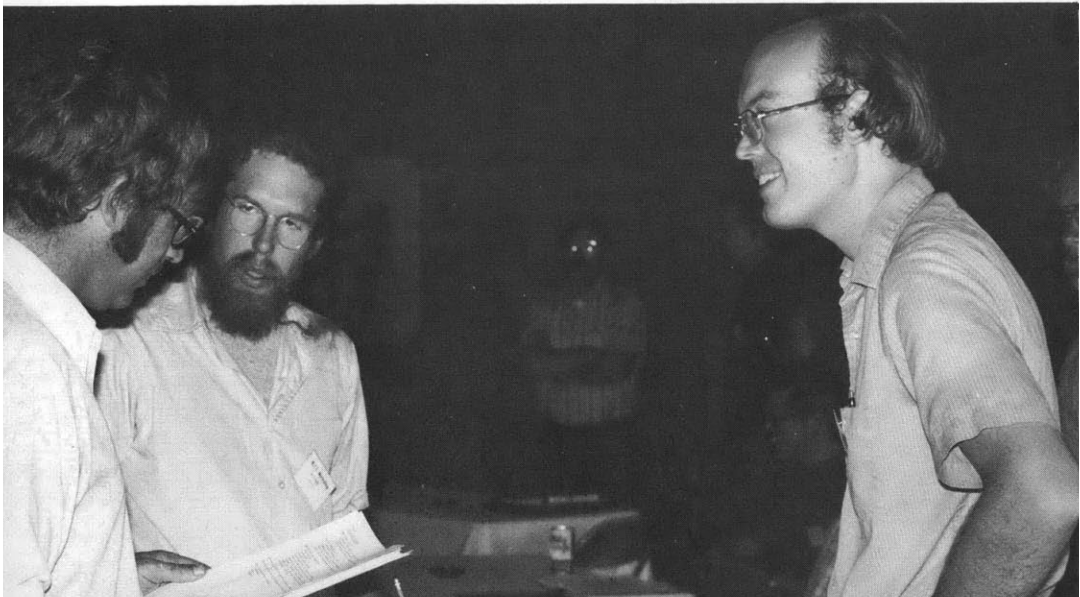
As part of NASA's program, the Flight Transportation Laboratory of the Massachusetts Institute of Technology studied *Aircraft Requirements for Low/Medium Density Markets* (FTL Report R73-4). In the course of this study, M.I.T. staff visited local service and commuter airlines, aircraft manufacturers, industry and trade associations and government organizations at the federal, state and local levels. As more people were contacted and preliminary results discussed, it became apparent to both M.I.T. and NASA that technology was only one aspect of the problem and that a much broader program was needed. As a result, the Offices of the Department of Transportation's Assistant Secretaries for Policy, Plans and International Affairs, Systems Development and Technology and the Federal Aviation Administration's Quiet Short-Haul Air Transportation Systems Office joined with NASA to support M.I.T.'s organization and management of a summer workshop on the broader problems of air transportation to the nation's smaller communities.

## The Workshop Concept

Workshops have been used for many years to bring together a group of people knowledgeable on a particular subject for an intensive period of discussion and interchange of ideas. Guest speakers make presentations on current activities, research projects, operational problems and the like. As many representatives of different perspectives and viewpoints as can practically be expressed are invited to participate at all levels of the program. Some participants come for only one session, some attend the entire program. A core group provides continuity throughout and is responsible for collecting all the viewpoints and formulating the issues and recommendations at a final presentation. This presentation is then converted into a report by the Workshop Director and staff and a draft is distributed to all participants for comments. The final report represents the consensus of the problems and issues raised and recommended actions. If there are strong divergent opinions, these are also documented.

The length of the Workshop is dictated by the complexity of the problems addressed. It requires one week to form the consensus and prepare the final briefing which serves as an outline for the report. From one to three weeks may be required to present all the viewpoints and study them in depth.

An important element is the human chemistry that takes place during the program. After several days, those who have attended



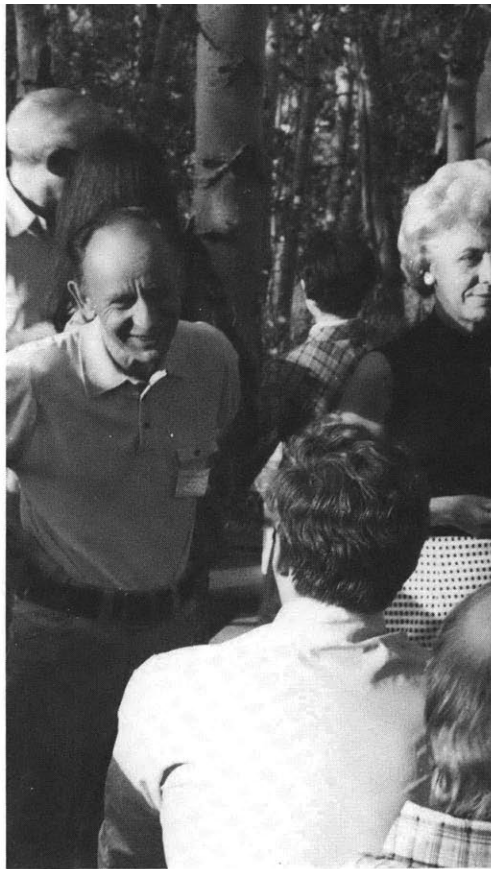
all or most of the sessions begin to shed their institutional personalities and react with the other participants on a more individual basis. Organizational barriers are lessened and eventually the man or woman on the other side of the table is no longer a potential adversary from another agency or company. This "chemistry" is perhaps the most important aspect of a workshop and cannot be forced or rushed.

To aid this interaction, a remote but attractive site is chosen. Participants are isolated from the day-to-day pressures of their offices and normal way of life so they can concentrate on the specific problem at hand. They are encouraged to bring their families and to enjoy the recreational aspects of the site when the workshop is not in session.

## The Workshop on Low/Medium Density Air Transportation

This Workshop was designed to fit the pattern described. Over 175 participants, panelists and speakers attended all or part of the program. Throughout a three week period, 130 presentations were made, then a final briefing was presented at the end of the fourth week. (Thirty speakers and panelists submitted their remarks for the record. These are reproduced in a separate volume.) Participants came from universities; federal, state and local governments; regional planning groups; airports; airlines; aircraft manufacturers and suppliers; equipment manufacturers; unions; consulting companies; civic action groups; the railroad industry; the banking community and other sectors. They included career civil servants, lawyers, regulators, planners, engineers, financiers, economists, marketing men, pilots, public relations men, etc. (All speakers, panelists and participants are listed in the appendices to this report.) Over 20 people attended for a period of two or more weeks and participated in the discussion groups and working sessions that led to the final briefing.

After the briefing, a draft report was prepared by the Workshop Director and sent to all participants and other interested parties for comments and review. Briefings based on the draft report were presented to



government and other groups and comments and suggestions were noted.

After all parties had an opportunity to respond, the draft report was revised based on the discussion, briefings, phone calls and letters received. The final draft is reproduced in this report and represents a majority viewpoint on the issues discussed and the recommendations made.

There were a number of divergent minority opinions expressed. The most pertinent of these comments are also reproduced in a separate section of this report. Taking a strong position and citing strong dissent was considered preferable to modifying the draft report to suit everyone, thereby creating extensive compromise and dilution.

In conclusion, the Workshop Director has written an epilog commenting on not only the Workshop itself, but also the reactions of others to it as perceived during the discussions and briefings that followed the distribution of the draft report. He also discusses what actions may be expected after viewing the entire Workshop-review process in perspective.

## BACKGROUND INFORMATION

In 1971, the problems of providing air service to low density, short haul markets were stated to be the third most pressing issue facing the U.S. aviation industry (surpassed only by noise and congestion).<sup>1</sup> More recently this problem was again highlighted in the 1973 Presidential Aviation Advisory Commission report.<sup>2</sup>

The major concern is that the number of points in the United States receiving certificated service is decreasing. In 1961 there were 729 certificated points.<sup>3</sup> By 1971 this number had decreased to 479.<sup>4</sup> About 100 of these points were marginal from the beginning and were never able to generate the 5 passengers per day upon which their certificates had been conditioned.<sup>5</sup> Commuter carriers have replaced certificated carriers in 42 of these markets and serve a total of 174 airports not receiving certificated service.<sup>6</sup> But many of these commuter markets are near large cities. The area of concern is the smaller, isolated point. The Aviation Advisory Commission estimates that 300 to 500 isolated communities exist (those requiring more than a one-hour drive to certificated air service) and are candidates for subsidized air service.<sup>7</sup> It is difficult to estimate the total bill for such a program. A similar proposal made in 1943 that would have provided direct air service to all urban communities was estimated at \$109 to \$150 million dollars annually (in 1943 dollars.)<sup>8</sup> Inflation would more than double that amount today.

### The Federal Program

Local air service to small communities began with the Civil Aeronautics Board's *Investigation of Local, Feeder, and Pick-up Air Service* initiated in March, 1943, and since then the CAB has instituted a number of policies in the attempt to place these services on a sound economic basis.<sup>9</sup> Many of the CAB policies and suggestions for solving the local air service problem were considered in the original 1943 investigation and have been revived periodically through the years.

During that investigation, the already certificated trunk carriers proposed that small community air service should be accomplished on a "self-sufficient" basis by authorizing additions to existing routes. Service to the new points would be cross-

subsidized by the carriers' profitable long-haul markets. The trunks claimed that "skip-stop" schedules would provide service at the small communities in accordance with traffic volume while their use of comfortable modern aircraft and the possible provision of single-plane through-service would stimulate demand at many small points.<sup>10</sup> These same arguments were later advanced by the local service carriers as justification for relaxing conditions on their certificates and for the use of larger aircraft. The CAB finally adopted that very policy as well as awarding local service carriers profitable long-haul routes as part of the route strengthening program of the mid-sixties.

The examiner suggested in 1943 that if special feeder carriers were to be established to provide local service, consequently limiting the growth of the trunks in those markets, then a balancing limitation should be imposed on the feeder carriers. They should be strictly limited to feeder service and "an inclination to grow in the other direction, that is, to nonstop smaller cities and reach out for big city traffic to the detriment of other carriers should be discouraged at the outset."<sup>11</sup>

Initial CAB discouragement was in the form of operating restrictions in the local carrier certificates. These operating restrictions reflected the two theories concerning traffic flows that existed in 1943. An analysis of rail and air traffic showed that "the preponderant movement of the traffic of small communities is to and from large cities, rather than between numbers of small

1. National Aeronautics and Space Administration, Department of Transportation. *Civil Aviation Research and Development Policy Study (CARD) Report*, DOT-TST-10-4, NASA-SP-265 (1971), p. 2-6
2. Aviation Advisory Commission. *The Long Range Needs of Aviation* (1973), p. VI-144.
3. Civil Aeronautics Board. *Annual Report, 1962*, Annex 4 (1962).
4. Civil Aeronautics Board. *Annual Report, 1971*, Table 1 (1971).
5. Anon. *Flight Magazine*, Vol. 56 (June, 1967), p. 67
6. *The Long Range Needs of Aviation*, *Supra*, p. VI-144, 146.
7. *Ibid.*, p. VI-146.
8. Civil Aeronautics Board. *Investigation of Local, Feeder, and Pick-up Air Service*, 6 CAB 1 (1944), p. 49.
9. Civil Aeronautics Board. *Docket No. 857*, *Ibid.*
10. *Ibid.*, pp. 29-30
11. *Ibid.*, p. 55

cities<sup>12</sup> On the other hand, bus data indicated that on relatively long routes connecting two major market centers a substantial amount of the traffic was of an "on-and-off" nature travelling between intermediate points.<sup>13</sup> The conclusion was that a reasonable feeder service would cater to both types of traffic, travelling between two large terminal cities with a number of intermediate points. Nonstop service was prohibited between two points designated on the certificate of an existing trunk carrier.<sup>14</sup> Although the examiner recommended that feeder carriers have some degree of leeway in arranging skip-stop schedules the CAB initially required feeder carriers to stop at every designated point. This has been gradually liberalized but, even with subsequent segment realignments, this policy remains evident in most local-service routes.

The 1943 investigation also found that a specially designed airplane was necessary for local service. The requirements envisioned were for a 12 passenger (3,000 lb. payload) multi-engined aircraft with a 150-180 mph cruising speed and operating cost of about 40 cents per aircraft revenue mile.<sup>15</sup> Twenty years later in 1963 the Association of Local Transport Airlines (ALTA) Small Plane Design Committee issued requirements remarkably similar calling for an 18 passenger airplane, a cruise speed of greater than 300 mph, pressurization (which did not exist commercially in 1943 on any aircraft) and operating costs of 40 cents per aircraft mile (although the CAB felt that 60 cents was a more reasonable goal).<sup>16</sup> Aircraft of this type finally became available in the late sixties with certification of turbine-powered DeHavilland of Canada Twin Otters and Beech 99s, which have subsequently played an important role in the rapid development of the commuter carriers who operated 171 of these aircraft in 1971.<sup>17</sup> The Twin Otter was primarily designed for service in rough terrain and isolated areas by bush pilots. Its commercial success in the U.S. was almost an accident. Otherwise, no aircraft has ever been specifically designed to meet the requirements of local air service. As a result, local service carriers have used aircraft unsuited to the markets which the carriers were certificated to serve.

The CAB discouraged early attempts of the local service carriers to acquire more

advanced aircraft. In 1953, an application by Pioneer for increased subsidy due to the operation of Martin 202s was disallowed by the Board and may well have been one factor leading to that carrier's later merger with Continental.<sup>18</sup> However, following permanent certification in 1955, the CAB relaxed its position and the local service carriers began to operate substantial numbers of more modern aircraft in place of the DC-3s used previously. These aircraft were larger than the DC-3s and more expensive to operate, requiring more passengers to break even. Without a suitable DC-3 equivalent, the carriers started to decrease and discontinue service at "marginal" communities which could not support the larger aircraft. The acquisition of jet aircraft beginning in the mid-sixties accentuated the problem of small-city service and accelerated the withdrawal.

## Subsidy

In section 406 of the Civil Aeronautics Act the CAB is directed to fix and determine "fair and reasonable rates of compensation for the transportation of mail by aircraft." This must be done in such a manner as to "maintain and continue the development of air transportation to the extent and of the character and quality required for the commerce of the United States, the Postal Service, and the national defense." From 1938 until October 7, 1953, the Postmaster General paid the total compensation to meet the "needs" of the air carriers as calculated by the CAB. Since then, airmail service compensation and subsidy have been formally separated with the CAB responsible for payment of the subsidy element through Congressional appropriation.

Prior to January 7, 1961, the CAB determined all subsidy needs on an individual carrier basis. Due to the rapid expansion

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12. *Ibid.*, p. 14.

13. *Ibid.*, p. 18.

14. *Ibid.*, p. 55.

15. *Ibid.*, p. 41.

16. CAB Bureau of Operating Rights Staff Study. *Service to Small Communities: Part II* (March, 1972), p. 18.

17. Civil Aeronautics Board. *Commuter Air Carrier Traffic Statistics — Year Ended December 31, 1971*, Table 15 (August, 1972).

18. *Service to Small Communities: Part II*, *Supra*, p. 12.

and continuous modification of the local service carriers' route structures after their permanent certification, this method proved inappropriate for these carriers, often leaving their subsidy rate undetermined for long periods of time. This impaired the carriers' ability to operate efficiently and plan for the future. Effective January 1, 1961, the Board established a "class subsidy rate" based on the average costs of the local service industry and standard investment criteria developed by the CAB from analysis of the carriers' requirements.

Since its adoption, the class subsidy rate formula has been modified many times.<sup>19</sup> Like those of its predecessor, the objectives of the present class rate are "to relieve the industry's still critically depressed financial condition; to equitably distribute the subsidy payments consistent with the changing needs of the individual carriers; and to establish a class rate formula that will identify the subsidy related to service at and between communities and provide positive incentives for the local service carriers to maintain adequate services to the small communities."<sup>20</sup> A further objective is to encourage small aircraft service at low-traffic-generating communities.<sup>21</sup>

In spite of these objectives, the last two class rates have not encouraged local service carriers to either improve service at smaller communities or use small aircraft (although some aircraft experimentation has taken place). Cross-subsidization through route strengthening has also proven inadequate and, although three local service carriers earned enough in 1971 on their ineligible routes to provide a degree of cross-subsidization, the industry is not expected to become subsidy free in the near future.<sup>22</sup>

The only other group of carriers currently receiving subsidy are the Alaskan airlines, whose requirements have slowly decreased from a high of \$9.7 million in 1963 to their current level of approximately \$4.5 million, less than 7% of the total federal payment.<sup>23</sup> Due to pressure from Congress and the Executive branch, subsidy to the helicopter carriers was eliminated after 1965, to the Hawaiian carriers after 1967 (except for 1969 when Aloha received \$0.8 million) and to the last trunk on subsidy, Northeast Airlines, after 1968.<sup>24</sup>

There is a continuing debate as to what the local service subsidy is buying. Ten

years ago, the local service subsidy was \$67 million as compared to approximately \$60 million in 1973 without adjustment for inflation.<sup>25</sup> The subsidy bill per passenger was \$8.44 ten years ago as compared with \$3.10 per passenger in subsidized service today as estimated by the local service industry.<sup>26</sup> If all passengers carried by local service carriers are considered, the subsidy bill is only \$1.90 per passenger or 1.3 cents per passenger mile.<sup>27</sup> During approximately the same period, revenue passengers increased 215%, revenue passenger miles 258% and available seat miles 217% (all in subsidy eligible service alone).<sup>28</sup>

On the other hand, the CAB staff study on service to small communities estimated the average subsidy payment per passenger at smaller points to be between \$21.23 and \$23.92 per passenger, the range of the average fare paid out-of-pocket by a local service passenger. For some individual cities, the estimate ran much higher, peaking at \$206.13 per passenger at Martinsburg, West Virginia.<sup>29</sup> In contrast, commuter carriers, with their lower overhead and smaller aircraft, estimate their average subsidy need at \$5 per passenger for all those markets in which they are currently losing money.<sup>30</sup> (Whether commuters can maintain their low cost structure as their industry matures remains in question.)

Citing changes in the small community

19. Civil Aeronautics Board. *Subsidy for United States Certificated Air Carriers* (August, 1972), pp 9-10.

20. Civil Aeronautics Board. *Docket No. 23682*, p. 2.

21. *Ibid.*, p. 23.

22. *Subsidy for United States Certificated Carriers*, *Supra*, p. 5.

23. *Ibid.*, Appendix VII.

24. *Ibid.*

25. Rasenberger, Raymond J. Problems and Issues Facing the Local Service Industry, *Workshop on Low/Medium Density Air Transportation: Supporting Papers*, M.I.T. Flight Transportation Laboratory Report R73-5A (August, 1973), p. 66.

26. *Ibid.*

27. Adams, Joseph P. Executive Director, ALTA. *Letter to The Honorable Robert H. Binder* (September 18, 1973), p. 3.

28. *Ibid.*, p. 2.

29. *Service to Small Communities*, *Supra*, Part I, p. 37, Appendix P-4, p. 3.

30. *The Long Range Needs of Aviation*, *Supra*, p. VI-148.

transportation system over the past decade and difficulties in assessing the effectiveness of the present subsidy program, the CAB in its 1972 Annual Report to Congress proposed a new method for providing air service to small communities. This would take the form of a contract bid system between the CAB and the carriers for services determined by the Board. The amount of subsidy would be predetermined through the carriers' bids with no renegotiation permitted and no follow-on contracts assured, while the performance of the carrier during the life of the contract would be ensured by required financial guarantees. As with the original 1943 "experiment" in local air service, the new system would initially be conducted on a limited 3-year basis in various areas of the country.<sup>31</sup> With changes in Board membership and staff, however, this proposal has fallen into disfavor.

A more recent proposal has been for "flow through" subsidy.<sup>32</sup> Payments would be made by the CAB to a certificated carrier, which would in turn make payments to a commuter who would provide substitute service. The CAB subsidy would thus "flow through" the certificated carrier to the commuter. Aside from legal objections, the major problem with the proposal is that it would apply only to points already certificated. Subsidy could not be given to a commuter for service to an uncertificated point where there would be no certificated carrier to "flow through."

## Development of the Carriers

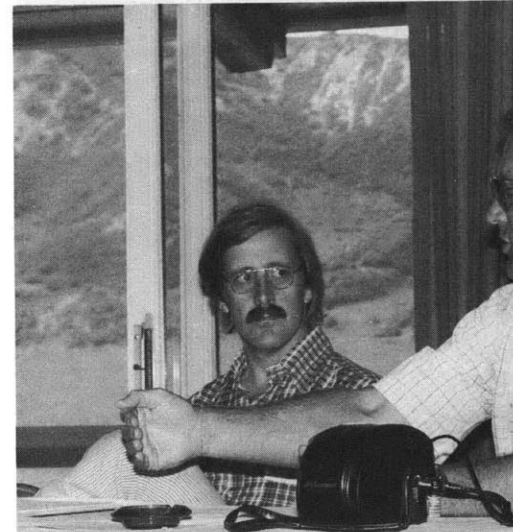
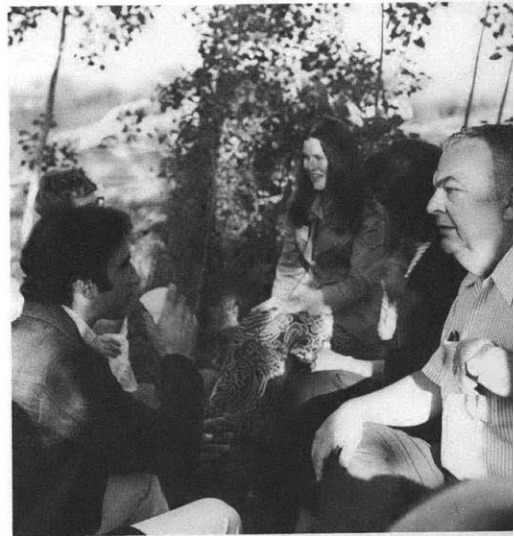
Several classes of carriers have evolved over the past 30 years and currently serve the smaller communities of this country: local service airlines, commuters and air taxis, "other" carriers and intrastate carriers.

### LOCAL SERVICE

When the CAB resumed its normal functions after the initial emergency of World War II, the number of applications for "local" and "feeder" air transportation

31. Civil Aeronautics Board. *Annual Report, 1972* (1972) pp. 10-11, 84.

32. Anon. *CAB Chairman Endorses Flow Through Subsidy Plan*, *Aviation Daily* (September 19, 1973).





were so numerous that a general investigation into these services was instigated on March 22, 1943, to determine "... the propriety of extending air transportation to communities and localities throughout the continental United States to which such transportation may not appear warranted under usual economic considerations or existing standards of operation, and the coordination of such transportation with air transportation presently authorized under usual considerations and existing standards."<sup>33</sup>

The *Investigation of Local, Feeder, and Pick-up Air Service* was not particularly optimistic in its determination of "... the extent to which small cities need and would use air service. . . ."<sup>34</sup> However, the CAB felt that its obligations to promote and encourage civil aeronautics under the 1938 Act, together with the enthusiasm of the applicants and the general lack of experience with this type of air service, warranted a trial experiment on a subsidized basis. Because these short haul, low density air services would face severe competition from surface modes of transportation and as a safeguard against static or increasing dependence on the Government, temporary three-year certificates were authorized confined "... to operations which show a justifiable expectation of success at a reasonable cost to the Government."<sup>35</sup>

Following its decision of July 11, 1944, the CAB held a series of consolidated area proceedings and by 1949 twenty new local service carriers had been certificated.

(Essair, which later became Pioneer Airlines, had been previously awarded authority on November 5, 1943, which was challenged in the courts. Service was not begun until April 19, 1945.) In the first of these cases, the CAB stated as its "guiding principles" in awarding local air service authority: prospects for success; benefit to the community; distance to the normal metropolitan trading center; time of travel by surface modes compared to air, including travel time to and from the airports used; the comparative frequencies of surface and air schedules; geographic conditions, especially mountainous terrain; and the financial cost to the Government.<sup>36</sup> In awarding authority for these expanded air services to new carriers over existing airlines, the CAB expected local operators with small aircraft to expend greater effort and ingenuity in meeting the needs of small communities.

By the mid-fifties the local service carriers were faced with the second and third renewals of their temporary certificates and sought more permanent status. In hearings before the House Committee on Interstate and Foreign Commerce, they argued that permanent certification was necessary because of the difficulties and increased costs

33. Civil Aeronautics Board. *Annual Report, 1943* (1944), p. 11.

34. *Ibid.*, p. 1.

35. *Ibid.*, p. 3.

36. Civil Aeronautics Board. *Service in the Rocky Mountain States Area*, 6 CAB 695 (1944), p. 731.



of operation on a temporary basis.<sup>37</sup> They stated that renewal proceedings consumed time and money which could be better spent improving the operations of the carriers, while their uncertain future discouraged aircraft manufacturers from designing an aircraft tailored to the requirements of the local-service airlines. They also claimed that temporary status precluded the economic advantages of long term arrangements for hangars, navigational equipment and maintenance facilities. (Many of these same claims are made today by commuter carriers who seek some form of certification.)

The CAB opposed such a move asserting that local air service had not yet reached maturity and that permanent certification would make improvements in the route systems of the carriers much more difficult.<sup>38</sup> It was felt that permanent certification would lessen the carriers' incentive to increase revenues and hold down costs and an annual subsidy bill of "over \$20 million" for the indefinite future was predicted. The Board argued that many of the costs of operation were held down precisely because of temporary status. With permanent certification, labor and airport service costs would increase substantially. At 47 percent, the CAB claimed that the average proportion of subsidy to total revenues was too high. Evidence was presented that the costs of recertification were not excessive. Rather, it was the accompanying requests for expanded authority which were expensive. Finally, the CAB argued that it was the market, not the carriers, which determined the development of new aircraft and that the Board would favor legislation to help local-service airlines finance new equipment.

In spite of the CAB objections, Public Law 38 was passed on April 19, 1955, amending the Civil Aeronautics Act to allow permanent certification of the local service airlines under "grandfather" provisions. The CAB then moved to expedite such certification to the 13 air carriers then in existence: Allegheny, Bonanza, Central, Frontier, Lake Central, Mohawk, North Central, Ozark, Piedmont, Southern, Southwest, Trans-Texas and West Coast. The law required that all terminal points and at least one-half the intermediate points should receive permanent authority. Other points could be added at the discretion of the Board, which subsequently determined that an average of five or

more enplaned passengers per day was necessary to receive certification.<sup>39</sup>

The CAB then embarked on a series of twelve area cases "to determine the overall needs for local-service air transportation and the extent to which the local air carriers could fulfill these needs."<sup>40</sup> In the *Seven States Area Investigation*, decided on December 8, 1958, the "use it or lose it" policy was introduced. Liberal route awards were granted. If for the year following the initial six-month start-up period the community met the minimum standard of an average of five enplaned passengers daily it would retain its air service, although continued service was not assured to cities enplaning the bare minimum.

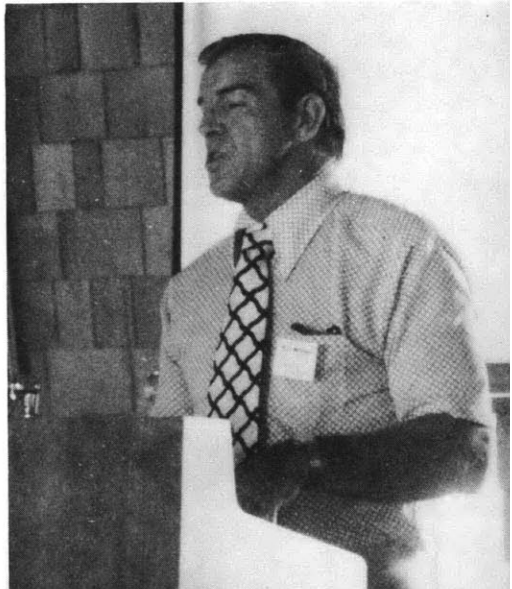
At the same time, "skip-stop" operating authority was granted to the local service carriers. As long as two daily round trips were scheduled to intermediate points, the carriers could provide nonstop service between non-competitive terminal points or one stop between competitive terminal points. Trunkline carriers were allowed to delete markets where local service could provide ". . . equal, additional, or improved. . ." air transportation to the com-

37. House Committee on Interstate and Foreign Commerce. *Hearings on Permanent Certificates for Local Service Air Carriers* (1955), pp. 30-31.

38. *Ibid.*, p. 135.

39. Civil Aeronautics Board. *Handbook of Airline Statistics* (1971), p. 485.

40. *Ibid.*, p. 487.





munities involved, even though the local carriers required subsidy which the trunk did not<sup>41</sup>

As a result, by the end of 1963 the unduplicated route miles of the local service carriers had increased by 37% and their annual subsidy requirement had more than doubled over its 1958 value, reaching \$67.7 million or about \$7.64 per scheduled passenger enplaned.<sup>42</sup> In his April 1962 message to Congress on transportation, President Kennedy called for reductions in the subsidy payments to the local carriers and requested a specific step-by-step program from the CAB by mid-1963. In response to the President, the CAB stated that the most subsidy saving would come from increased local-service revenues as a result of a period of stabilization after recent rapid route growth and equipment modernization, but that savings would also come from a gradually reduced subsidy standard on high density routes, a consolidation of airports and a continuation of the "use it or lose it" program.

The subsidy requirement began to come down and by 1966 the policy had been further broadened by awarding certain high-density short and medium haul markets to the local service carriers on a subsidy ineligible basis "even in instances where such an award may involve competition with trunkline service."<sup>43</sup> Other routes, marginally profitable for the trunks, were transferred to the locals and many existing segments were consolidated in a number of realignment investigations. The operating authority of the local service carriers was thus extended into regions outside their historic markets, giving them access to additional high traffic-generating hubs.

Finally, in 1967 the CAB authorized the first commuter airline substitution agreement. A commuter actually provides the service in these markets. However, the local service carrier continues to bear the responsibility of ensuring adequate service as required in its certificate and must be prepared to reinstitute service if the commuter should fail. By October 13, 1970, the CAB had authorized local service carriers to suspend service at 39 points where a commuter replacement provided an adequate level of service.<sup>44</sup> On January 15, 1968, Subpart M of Part 302 of the CAB's economic regulations was adopted to expedite procedures

for modification or removal of certain stop restrictions in local service carriers' certificates. The merger of Mohawk with Allegheny in 1971 concluded a period of carrier consolidations leaving the present eight local service carriers: Allegheny (Mohawk, Lake Central), Frontier (Central), Hughes Air West (West Coast, Bonanza, Pacific, Southwest), North Central, Ozark, Piedmont, Southern and Texas International (formerly Trans-Texas)

## COMMUTERS AND AIR TAXIS

Shortly after its creation, the CAB adopted Regulation 400-1 on October 18, 1938, exempting all carriers engaged only in non-scheduled operation from the economic and safety provisions of the Act. In its *Investigation of Non-scheduled Air Services* begun in July 1944, the CAB concluded on May 17, 1946, that the distinction between scheduled and nonscheduled carriers was fundamental. As a result, a new class of carriers called "noncertificated irregular carriers" was created with minimal reporting requirements. Carriers operating aircraft of under 10,000 pounds gross take-off weight (later amended to 12,500 lbs.) were classified as "small irregular carriers." Only a letter of registration was required but any regular service between two points was prohibited.

In 1952 the Board enacted Part 298 of its economic regulations. Recognizing that the small irregular carriers were not competitive with the certificated route carriers, the CAB authorized them to provide regular service connecting small communities not served by the scheduled carriers with certificated points. This authority was virtually unlimited within the continental United States and between the U.S. and foreign and overseas points, prohibited only between points receiving helicopter service. Operations were restricted within U.S. territories and possessions and banned entirely in Alaska

41. *Ibid.*, p. 487.

42. *Ibid.*, p. 54; Civil Aeronautics Board. *Annual Report, 1968* (1968), p. 113; *Subsidy for United States Certificated Air Carriers*, *Supra*, Appendix VII

43. Civil Aeronautics Board *Annual Report, 1966* (1966), p. 4.

44. *Service to Small Communities*, *Supra*, Part II, p. 29

where it was felt that the need for supplementary service was amply met by the various existing classes of Alaskan air carriers. Part 298 also changed the name of these small carriers to "air taxis" to more nearly reflect the nature of the services performed and to encourage their use by the public.

The authority to carry mail was initially withheld from air taxis but in 1965 Part 298 was amended to allow mail service on an unsubsidized basis for a three year period within the continental United States and Hawaii in markets where no certificated carrier held active authority.

Further amendments that year eliminated prior restrictions on passenger and cargo operations within U S territories and possessions, removed the prohibition on regular services between points served daily by a certificated carrier and liberalized operating authority in Hawaii.

Since 1965 Part 298 has been further amended several times extending and expanding the operating and airmail authority of the air taxis, including permission to carry mail in competitive markets. Most notable was the 1972 modification permitting the use of aircraft with up to thirty passenger seats and a payload capacity of 7,500 pounds, although prior to this time the use of large aircraft had been specifically authorized in a number of special markets and areas.

In 1969 another amendment to Part 298 required all air taxi operators to register annually and created "commuter air carriers," i.e., "those operators which perform, pursuant to published schedules, at least five round trips per week between two or more points," as a separate subcategory of air taxi. Commuter air carriers are required to file quarterly reports of their operations. Apart from the restrictions discussed, the CAB exercises no other regulatory control over commuter carriers.

With freedom of entry and exit the turnover rate for commuters has been quite high. However, the industry has been both growing and becoming more stable each year. Out of the 1015 points receiving scheduled passenger air service in the 50 states, Puerto Rico and the territories and possessions of the United States, 213 or 21% are served exclusively by commuters as compared to 324 or 32% served exclu-

sively by certificated carriers. 478 points or 47% receive service from both. 110 commuters publish their schedules in the Official Airline Guide. It is estimated that commuters carried 5.9 million passengers, 74.4 million pounds of cargo and earned revenues in excess of \$136 million in fiscal 1973. Commuters are flying 165 airmail routes with an annual pay rate of \$23 million.<sup>45</sup> Although these figures are small compared with the certificated industry, they represent rapid growth and expansion since 1965.

On July 17, 1967, Apache (a scheduled air taxi) was authorized to provide substitute service for American Airlines at Douglas, Arizona.<sup>46</sup> Since then suspension of certificated carrier operations at marginal points in favor of commuter carriers has grown rapidly. As of October 13, 1970, substitution had been permitted at fifty-five points, thirty-nine for local service carriers and twenty-six for trunks.<sup>47</sup>

In many cases, the application for suspension/substitution authority has been coupled with a contractual service agreement between the commuter and the certificated carrier. These agreements have varied, but the most comprehensive involve the "Allegheny Commuter" program.<sup>48</sup> Subject to CAB approval, Allegheny selects its commuters, awards them ten-year contracts and guarantees a breakeven financial position during the first two years. Participating commuter carriers are called "Allegheny Commuters", paint their aircraft in Allegheny colors and offer joint fares. Allegheny provides its computerized reservation service, inter-line ticketing and baggage handling and includes the complete schedules of the commuters in its own timetable. Allegheny requires the commuter to maintain the same level of liability insurance as it does itself, a uniformed captain and first officer and a 95% completion factor.

## "OTHER" CARRIERS

Prior to giving air taxis scheduled service

45. Nation Air Transportation Conferences. *Clearing the Air* (August, 1973), p. 33.

46. *Annual Report, 1968*, *Supra*, p. 119.

47. *Service to Small Communities*, *Supra*, Part II, p. 29.

48. *Ibid*, pp. 35-38.



authority in 1952, the CAB had temporarily certificated a number of commuter services in the forties on a nonmail (nonsubsidy) basis. Most of the certificates were never renewed nor scheduled services initiated. More recently a few commuter-type operations have been certificated under the CAB classification of "other" carriers.

On January 11, 1960, Avalon Air Transport was authorized to carry passengers, property and mail without subsidy assistance between Santa Catalina Island and the Los Angeles area. This service had previously been abandoned in 1955 by Catalina Air Transport, certificated under the "grandfather" provisions of the Civil Aeronautics Act. Avalon itself operated as an "other" carrier only until its temporary certificate expired, after which time it continued service as a regular air taxi. In 1966 Aspen Airways, having operated as an air taxi since 1953, requested a certificate for its operations between Denver and the Aspen ski resort. A certificate was granted on a nonsubsidy basis in June 1967 and since then two other carriers have been similarly authorized: Tag Airlines in November, 1969, and Wright Air Lines in July, 1972. Tag later suspended operations in August, 1970.

### **INTRASTATE CARRIERS**

An intrastate carrier by definition provides service totally within the borders of one

state. To retain this status, it cannot participate in interstate air commerce, i.e., it cannot carry mail, interline interstate freight or exchange passengers or baggage which are interstate. Separate ticketing and way bills are usually used, normally purchased in the state. The fact that the passenger or cargo actually moves as part of an interstate trip is immaterial as long as the carrier and traffic comply with the intrastate/interstate technicalities.

As an intrastate carrier, the airline is exempt from all federal economic regulations (but must comply with federal safety requirements) regardless of the size aircraft it operates. Thus Southwest Airlines in Texas and Pacific Southwest Airlines (PSA) in California can operate large jets while retaining their exempt status. The operators of small aircraft have the option of registering with the CAB as an air taxi or commuter or not registering and maintaining an intrastate system. Small operators often shift back and forth from one status to another, which is frequently what has happened when a commuter disappears from the CAB's files.

Many states now regulate intrastate operators at the state level. The regulations can be either quite detailed (resembling full CAB regulations), minimal or anywhere in between. State regulations may also apply to the intrastate portions of an interstate carrier's operations.

## Industry and Market Structure

Grouping airlines as local service or commuter carriers does not adequately describe either the characteristics of a particular carrier, the markets served, the route patterns used or the services provided. For example, local service carriers can be divided into at least three subgroups. First, Allegheny stands by itself as by far the largest and most trunk-like local service airline. (In fact, it boards more passengers than several trunks.) The second group is composed of Frontier, Hughes Airwest and North Central. Each of these is characterized by extensive route mileage (6,500 to 8,500) and a high number of stations (70 or more). The third group is the four smaller carriers: Ozark, Piedmont, Southern and Texas International. Each has a route network of less than 6,000 miles and serves 50 to 55 stations. These smaller carriers also tend to be concentrated in one geographic region even though they do have some long haul routes. This makes their choice of equipment easier since most points in their systems have similar weather and geographic features. In contrast, a larger carrier like Frontier must operate in Montana winters, Texas summers, Arizona deserts and Colorado mountains.

The commuter industry is also quite diversified. Some of the carriers are in fact "mini-airlines," operating multi-aircraft fleets throughout regions several hundred miles square. At the other extreme are the "mom and pop" operators with one or two aircraft serving a single market. Some commuters provide basic air service to small isolated communities. Others offer air service as a convenience to travellers in dense population areas who want to save time getting to the airport for connecting flights. Operators in these dense markets already provide high frequency service and are now looking for aircraft in the 30 seat range to meet peak demand (particularly where airport slots may be limited). Other operators are looking toward the day when their markets will support more than a few flights per day and they may be able to use 15 to 19 passenger aircraft like the bigger commuters.

Because of the diversity in both the local service and the commuter carriers, it is better to discuss problems in terms of route structures, the type of service offered and

the types of markets served rather than characterize the problems by industry.

## ROUTE STRUCTURES

Ideally, an airline selects the aircraft best suited to its route structure. If there is no appropriate aircraft, the airline will select the next best option. Once this non-optimal aircraft is in the fleet, however, the airline will try to modify its route structure to take advantage of the aircraft's specific characteristics. Thus route structure and aircraft type are intimately connected.

Several route structures can be identified. The classic route patterns of the local service industry are the hub-to-hub multistop feeder patterns. In the hub-to-hub case, the aircraft leaves the initial hub with a fairly high load. A number of these original passengers get off at the first stop, some at the next, and so on, until few if any get off at the destination hub. However, a few passengers for the destination hub may get on at the first stop. More board at the second and succeeding stops until the plane arrives at the destination. Since few passengers travel between the smaller cities by air, most are travelling to or from the smaller city and the hub at either end. Thus, although each stop may not produce many boardings or departures, the overall load-factor for any segment does not vary as much as might be anticipated.

In contrast, the multistop feeder flight does not serve a hub at both ends of the route. It picks up a few passengers at each small stop on its way to the hub and drops them off at the hub. Other passengers are then picked up at the hub and dropped off at the small stops on the return trip. Therefore, the multistop feeder flight does not accumulate additional passengers as passengers from the hub deplane. As a result, there may be high load factors for the segments near the hub but low load factors at the extremities.

Both of these service patterns present an aircraft sizing problem. The plane must be able to accommodate the traffic on the peak segment. As a result, the aircraft is too large to economically serve less dense markets. It has been argued that the CAB's early policy of requiring local service carriers to provide multistop service created this "segment flow" problem and is the primary reason that an economical smaller aircraft has not been

developed as a "DC-3 replacement".<sup>49</sup> Whether this is true or not, the multistop route structure has determined the aircraft size.

With the acquisition of jet aircraft capable of serving longer haul markets, several of the local service carriers have developed route patterns defined as regional-bypass-to-distant-hub or bypass routes. Rather than feed traffic into the local hub and there lose it (or at best be forced to compete with a trunk carrier for the long haul flight to the distant hub), the local carrier makes one or two stops at smaller cities to accumulate passengers and then flies directly to the destination, bypassing the regional hub. After acquiring DC-9s, Southern revamped its entire service pattern to use this bypass concept where possible, an example of the aircraft shaping the route structure.

A final route structure, most often seen in commuter operations, is the hub-and-spoke pattern. The carrier provides nonstop or at most one-stop service from outlying areas directly to the hub. Since the commuters do not face a segment flow problem, they can size their aircraft for the specific run. Peak capacity is provided through scheduling additional sections.

## TYPES OF SERVICE

There are two basic types of air service. The first is origin-destination service where the traveller both starts and completes his trip on one flight. The second is connecting service. The passenger is transferred from his community to the regional hub where he connects with a long haul flight (usually of a trunk airline) to his destination.

Many commuter airlines have been created specifically to serve this connecting traffic market, particularly in high density areas surrounding major hubs. In these areas, the carrier is competing with the automobile, the principal mode of airport access. To compete effectively, total trip time and cost must be competitive with the car. Therefore, the carriers have tailored their service to meet the connecting passenger's needs. Flights are timed to match the long haul departure and arrival patterns at the hub airport. Service is frequent throughout the day in order to reduce waiting time at the hub.

To compete on a cost basis, the commuter may offer free or reduced rate parking

at the local airport. Joint and through fare agreements with the certificated carrier are also used to lower traveller costs. The passenger pays a small portion, if any, of the normal commuter fare. The remainder is reimbursed to the commuter by the certificated carrier from the long haul revenues. By offering the package, the certificated carrier can capture more of the long haul traffic than another certificated carrier who does not participate in a joint or through fare arrangement. The commuter carries more traffic and the traveller receives better service for about the same cost.

Commuter carriers serving the low or medium density markets face a different problem. A higher percentage of their traffic is origin-destination, people from the small community going into the hub for personal or business reasons. This dictates a different service pattern. The origin-destination passenger would like to leave the outlying community in the morning and return in the evening. There is high demand during these periods, but much less during the rest of the day. As a result, aircraft utilization is low unless the carrier can develop off-hour markets. Cargo and mail contracts provide offsetting loads in many cases. In other markets, the carrier may try to provide connecting service in a shorter haul market using his idle aircraft to provide frequency. In any case, the resulting service pattern will not be the same as for high density feeder operations.

Since a commuter carrier usually specializes in either high density hub-and-spoke feeder operations or low density service, he can tailor his service patterns, routes and aircraft for one market or the other. In contrast, the local service carrier must serve both types of markets simultaneously. Cities closer to the air hub generate a high percentage of connecting passengers while more remote cities generate origin-destination traffic, probably because people closer to the hub are more likely to drive into town for personal or business reasons than people several hundred miles away who must depend more on air. Also,

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49. Eads, George. The Search for an Efficient Short-Haul Aircraft: A Case Study in Conflicting Government Incentives, *Workshop on Low/Medium Density Air Transportation: Supporting Papers*, Supra, p. 149

there is a lower percentage of connecting passengers on flights into the hub from communities that have air service to other hubs since the connecting passengers from the small town are spread among several connection points.

Because of the segment flow problem discussed earlier, the local carriers use fairly large aircraft, at least compared to commuters. Since these aircraft cost more per mile to operate than a commuter aircraft, a local is not able to provide as high frequency in a connecting market as a commuter carrier using smaller planes. Likewise, a local must generate more passengers than a commuter to break even at low density points.

Through the use of through and joint fares, the local can offer some of the same economic incentives as the commuters for the connecting passenger. Likewise, the benefits of reduced parking rates can also induce connecting passengers to use the local carrier instead of driving. Unlike the commuter, however, the local carrier cannot tailor his service to connecting or origin-destination traffic since he must serve both types of markets at the same time. He must strike some compromise

To maximize revenues under this complex situation, many locals have developed an effective strategy. Profitable markets receive excellent service: aircraft are used at prime hours and with sufficient frequency to maximize passenger satisfaction, thus maximizing passenger revenues. The low density markets that don't support themselves receive the minimum service needed to entitle the carrier to subsidy. Since the CAB does not specify when subsidized service is to be rendered, the carrier fits its schedule around available aircraft, often at off-peak hours, to serve the low density points. This minimizes the cost of serving these markets, maximizing the revenues derived from subsidy.

The resulting multistop or off-hour flights do not satisfy the needs of these markets. There is not enough frequency to satisfy the connecting passenger and the times of arrival and departure are not tailored to one-day round trips to the nearest air hub. However, it is probably the best service available under the regulatory circumstances. Many of the local service carriers have a real interest in serving the markets

they were created to serve. But if they were to change their service patterns, they would lose more revenue from their better markets than they would gain from subsidized points. The resulting overall loss would increase overall system subsidy requirements and eventually lead to general decay of service to all points.

## MARKET STRUCTURE

Markets can be defined in terms of the number of passengers generated, the length of haul and the degree of isolation from other cities or transportation hubs. The first and second elements of this definition indicate the economic condition of the market. The first and third elements reflect the public benefit provided by the service.

In addressing the problem of market definition in the past, rather mechanical approaches have been taken. For example, the Civil Aeronautics Board under its "use it or lose it" policy would allow a petition by a carrier to delete communities boarding 5 or less people per day from the carrier's certificate, unless unusual circumstances could be shown. In the 1971 Bureau of Operating Rights' study on service to small communities, a test based on both the number of boardings and the degree of isolation was proposed. The degree of isolation was measured on a sliding scale that factored in both the length of drive to the nearest air hub and the service level at the hub.

This type of mechanical test offers computational ease, but raises the issue of where the limits should be set. Since the decision must, by its nature, be somewhat arbitrary, the limits will be too severe in some markets and too lax in others. However, the mechanical test is useful in establishing a baseline or starting point for regulatory policy and procedures.

An economic market definition can also be selected. For a given fare and cost structure, the economics of a given market are determined by the number of passengers boarded and the length of haul. With this in mind, a low density market can be defined as one in which a carrier's revenues, excluding subsidies, do not meet its expenses, while a medium density market is one in which the carrier can at least break even. A carrier can convert a low density market into a medium density market by either raising

the revenues generated or by lowering expenses. Conversely, a medium density market can erode into a low density market if revenues fall or expenses increase.

To decide whether revenues cover expenses, one must consider the impact of the particular market segment on the total system and not examine it on its own merits alone. Often the people boarded at a small community will connect to a more profitable long haul flight on the same airline. Thus a carrier that captures a high percentage of its small town traffic for longer haul flights will continue to serve a low density point even without external subsidy.

Revenues can be increased by either raising fares or increasing passengers. Depending on the fare elasticity in the market, a fare increase might actually decrease overall revenue and so must be considered with caution. To generate more passengers, improved service and/or advertising may be required. But this could increase expenses which might offset any revenue gains, particularly if only a few additional passengers are boarded.

Expenses can be lowered in many ways. The most common has been to reduce the level of service. In general, this has resulted in fewer passengers as people substitute their automobiles for infrequent or inconvenient flights.

Since most local service and commuter carriers have limited capital, the response in low density markets has been to minimize expenses rather than maximizing revenues.

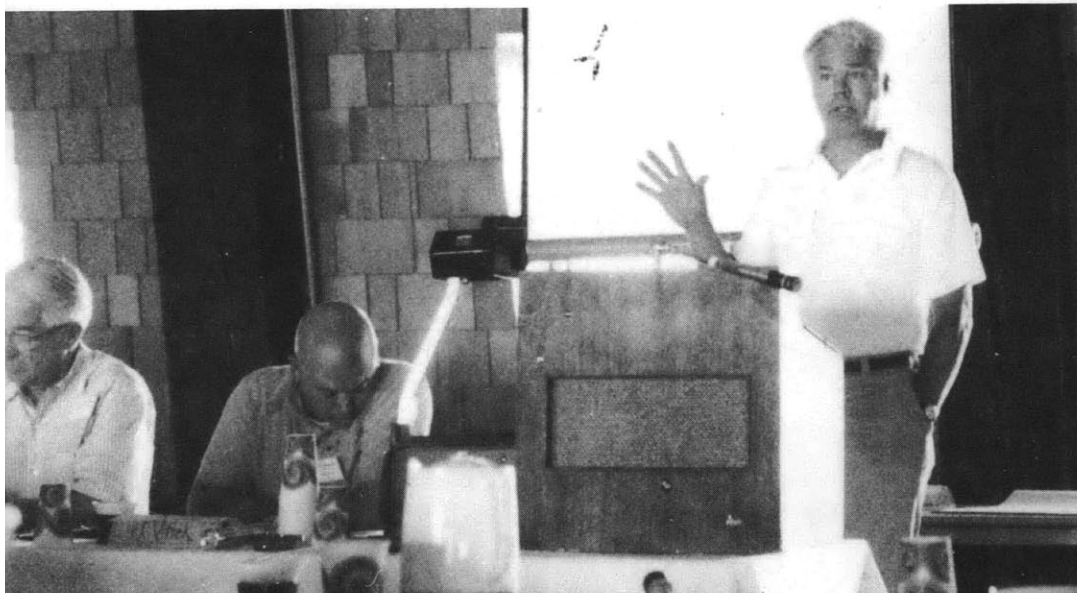
They are rarely willing to gamble on revenue increases resulting from fare cuts or service increases. The result has been a decline or actual deletion of service to points that might have the potential of supporting air travel if service were improved.

What is a low density point for one carrier could be a medium density market for another. Commuters, with their lower cost structure, can serve points profitably that would require a subsidy for a local service carrier. However, there are some markets that cannot support regularly scheduled air service by any type of carrier. These can be defined as very low density markets and would be most economically served by on-demand air taxi operators, if at all.

The degree of isolation is not an economic factor, but a political issue relating to whether there should be service at all. This public service aspect of air transportation was recognized by the CAB during the early 1940s and was a major factor in starting the *Local Service Experiment*.

As with low and medium density, the degree of isolation escapes precise definition. As mentioned, the CAB Bureau of Operating Rights' report on service to small communities recommended a test based on the driving time to the nearest hub and the level of service at that hub. No community within 90 driving minutes of any hub was considered isolated. If the hub were a major one, no community within a two-hour drive was considered isolated.

A less precise definition has also been

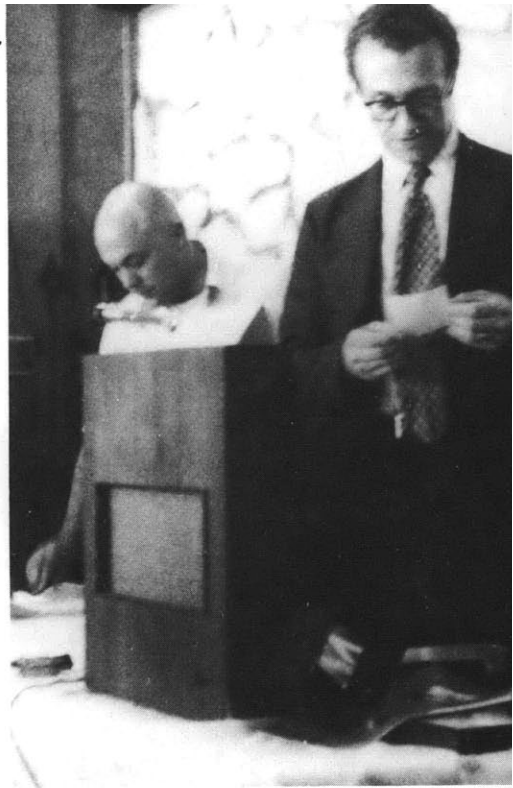




used.<sup>50</sup> A market is not isolated as long as the automobile is an effective transportation mode. A market is isolated when the bulk of the intercity traffic goes either by air or not at all.

Another type of market was specifically identified with respect to typical commuter operations. This is the high density feeder market primarily providing airport access from communities surrounding major hubs. Operators in these markets face different problems than those in low or medium density areas. They provide high frequency, very short haul service with resultant high aircraft wear from frequent takeoffs and landings. Economically, the major problems are a high degree of peaking and directionality in their traffic flow as well as automobile competition. Faced with many empty backhauls, it is difficult to get the system load factor over 50%.

A final type of market is created by geographic considerations, taking special advantage of the ability of aircraft to fly over water or mountainous terrain. Automobile travel, if available at all, is circuitous and time consuming. Examples are Aspen and Rocky Mountain Airways' service to mountain ski resorts and the service of a great many carriers to the islands of the West Indies.



50. Ausrotas et al. *Aircraft Requirements for Low/Medium Density Markets*, M.I.T. Flight Transportation Laboratory Report R73-4 (September, 1973).

## WORKSHOP REPORT

In the course of twenty panels and one hundred thirty speakers, several topics emerged over and over again. Therefore, rather than report on each panel individually, the important issues have been grouped and will be discussed in that framework. Four major groupings are used:

1. National Transportation Policy Issues
2. National Air Transportation Policy Issues
3. Low/Medium Density Air Transportation Policy Issues
4. Technology Issues

### National Transportation Policy Issues

Although the basic topic of the conference was the problem of air service to low and medium traffic generating points in the United States, this arena is only one part

of the total national transportation system. Policies and decisions affecting that system at the national level may have a direct, although often unanticipated, impact on the low/medium density markets.

### THE ROLE OF THE DEPARTMENT OF TRANSPORTATION

To date, there has been no clear statement of overall national transportation policy that provides direction to the planner, the industry or the public. As a result, each problem arising in the transportation field has been addressed in an uncoordinated manner by either the agency with primary responsibility or by the Congress if the problem were serious enough. These responses have been reactive rather than forward-looking and, as such, provide no basis for future planning.

The Department of Transportation, founded in 1966 to assume the leadership





role, has failed to provide the necessary guidance. Although it has succeeded in certain isolated cases, the early internal strife and conflicts among the operating agencies themselves and between the agencies and the Office of the Secretary have left an image of an ineffective bureaucratic machine without a goal or leadership. Therefore, the first and perhaps strongest recommendation of the Workshop was that

**The DOT should take an active, aggressive role in the formulation and coordination of integrated national transportation policy.**

In performing this task, the DOT must realize that transportation is not an end in itself, but a means of attaining other goals. Therefore, the DOT must work with other agencies of the government to identify national goals and how transportation can help meet them. The DOT must also work with regional, state and local authorities to help them with their planning. The role of the Department is not to do the planning for these authorities, but to provide assistance and coordination so the local needs and solutions fit into the national system. The 1972 *National Transportation Needs Study* and its succeeding improved versions were a first step in this direction, but much more must

be done.

The above criticism of the DOT has been made often without visible response. The Workshop was frankly embarrassed to make it again, fearing that no one would read further, having dismissed the Workshop's efforts as trite. But although later recommendations are more specific and can be implemented even without national planning, it is important to reiterate our urgent need for overall direction and coordination if the major transportation problems facing the country are ever to be truly solved.

**RESOURCE ALLOCATION**

One goal of national transportation planning should be proper resource allocation. This means that the planner should consider on one hand both the economic and energy efficiency of each mode and on the other hand the desires of the consumer as reflected in his modal choice.

**Economic Efficiency.** To determine true economic efficiency, all costs must be considered. These include environmental costs and costs associated with not making alternate investments as well as the direct costs associated with the plan selected. The mode with the lowest total cost is the most efficient.

One way to achieve low cost is to rely on competition wherever possible. The direct incentive to the owner or operator to maximize his profits by lowering his cost is stronger than any amount of government regulation.

However, the owner-operator's decision is usually based on his direct perceived cost. Environmental costs or total system costs are often ignored by the private investor. Therefore, government intervention in the basic market system may sometimes be required to assure that all costs, particularly social costs, are considered.

Intervention can take the form of direct regulation enforced through civil or criminal penalties; taxation or tax relief to dissuade or encourage a particular activity; or subsidy to encourage performance or compliance. Where the government provides financial incentives, those incentives should be structured to either minimize cost for the desired result or maximize results for the dollars allocated.

**Energy Considerations** If the market mechanism always worked, there would be no need to consider energy separately from costs. However, the market does not operate perfectly. In addition, federal and local governments have distorted the market not only through their policies toward transportation but also through their policies toward energy producers. Regulation of natural gas prices, control of atomic energy, tax depletion allowances for petroleum and regulation of the shipping costs of coal have affected the relative costs and values of energy sources.

The political task of readjusting all government policies to allow fuel markets to reflect true costs is impossible. Therefore, the transportation planner must consider energy efficiency separately from and in addition to economic efficiency.

Presentations made to the Workshop indicated that the airplane is inefficient as compared to rail or bus/truck transportation in terms of units of energy consumed per passenger or ton mile produced. This is offset by the speed and convenience of air in long haul markets where the value of time becomes important for both travellers and goods. However, based on energy considerations alone, there is little justification

for using air in place of bus or rail in short haul markets where these alternatives are available. If predictions of shrinking supplies of petroleum fuels are true, fuel efficiency may dictate that there be no new V/STOL systems or other air service in the high density short haul markets where trains will become the dominant mode of intercity public transport. In lower density short haul markets, air will be displaced by bus. Even if synthetic fuels are introduced, fuel costs will definitely go up, making air a less attractive competitor in short haul markets.

**Consumer Choice** The third consideration for allocating resources to transportation and among the transportation modes is the desire of the consumer, normally reflected in the price and time he is willing to allocate for the service offered. The planner who decides that a bus should replace air transportation to a small town based on economic and energy efficiency alone, although perhaps accurately reflecting the supply side of the equation, has failed to consider the demand aspect. Consumers may prefer to pay a premium to ride a less economic and energy efficient vehicle. The planner cannot preclude free consumer choice but can only hope to adjust perceived costs to reflect true costs. The user should then be free to pay a premium if he so desires.

With these factors in mind, the Workshop recommended that

**In taking the lead in transportation planning and coordination, the DOT should consider modal economic efficiency (including all private and public costs and benefits), modal energy requirements and consumer desires in formulating policy.**

## **FEDERAL SUBSIDIES**

Federal subsidies to transportation are made in many ways, direct and indirect. These payments take the form of capital grants, low interest loans, free services and, as in the case of AMTRAK and the local service airlines, direct operating subsidies. There seems to be, however, a trend away from using general taxpayer funds and toward directly assessing the user for the costs of the system. It was the feeling of the

Workshop that this trend should be continued and encouraged

Many federal subsidy programs use general funds provided by the nation's taxpayers-at-large to support essentially local or regional services. This applies to urban mass transit as well as local service airline subsidies. While the nation as a whole may benefit indirectly from the increased employment, higher levels of commerce, etc., that accompany better transportation, the primary beneficiaries are the users who pay less for the service than it costs. The balance of the cost is paid through federal taxes on users and non-users alike. But do the indirect national benefits received compensate the non-user for his contribution? There are other service and manufacturing industries that provide similar indirect national benefits without federal subsidy. Why should transportation receive these payments while similar industries such as public utilities or broadcasting and telecommunications do not? The Workshop was not against subsidy per se, or even federal subsidies, but federal subsidy of primarily local benefit was found without merit. As an ideal, the Workshop recommended that

- 1. Federal subsidies to transportation should be paid only when**
  - A. There is a clear national policy that the subsidy payments encourage or support; or**
  - B. The subsidies are for limited experiments to demonstrate the potential of new concepts to the private market, which would take over implementation if the demonstration were successful.**
- 2. This policy toward transportation subsidies should apply to all modes.**

In formulating national transportation plans, the DOT should recommend to Congress the adoption of a broad, consistent policy toward transportation subsidy in lieu of present, uncoordinated programs administered under numerous and often conflicting laws.

## **RURAL-URBAN EQUITY**

Transportation, like government, is worthless unless it meets the needs of the people. It must be people-oriented, either moving

people themselves or moving the goods people need or produce. It must serve the population as a whole, not merely some subsegment.

During the past several decades, there has been a decided shift in federal policy toward improving the urban environment. This is reflected in government expenditures on transportation. AMTRAK, designed primarily to serve the large cities and connecting corridors, requires somewhere in the vicinity of a \$150 million yearly operating subsidy. Rapid transit operating subsidies paid from the highway trust fund, if approved, will be millions more. In contrast, the \$60 million expended annually for local airline service is the only direct federal operating subsidy to rural transportation. Yet 42% of the nation's population lives in rural America or in cities of less than 50,000 people.

The Workshop realized that equal treatment is not possible or perhaps even desired. However, it recommended that

**DOT, as part of its planning process, should attempt to strike a better balance between rural and urban transportation services.**

For example, the Workshop heard presentations indicating that state commuter airline systems could be developed to serve the needs of the community without subsidy after an initial start-up period. A program in the Canadian province of Ontario, under way for 18 months, shows great promise. A study for the state of North Dakota by Beech Aircraft indicated that a similar plan might work in the United States. Without endorsing any specific proposal, it was the consensus of the participants that a well-planned and thought-out state program had a high probability of success. To ensure success, those developing the plan would have to realize that not all cities and towns could be served economically by air. Therefore, only those that had the potential for eventual self-support could be selected (or provision could be made at the state level to subsidize non-economic points). The plan would have to be based on realistic estimates of costs, traffic levels, fares, frequencies and the other parameters that could affect the system. The Workshop felt strongly that once a state developed a reasonable program along these guidelines,

a self-supporting system would emerge. Total cost for a state with low population densities would probably not exceed \$2 to \$3 million over a three-year start-up period. Higher density states would require even less. But there is an admitted element of risk.

No commuter carrier could be expected to risk losses of this magnitude over several years in anticipation of future profits. State legislatures, generally without transportation backgrounds, could not be expected to provide this support without considerable education and political pressure. Therefore, the Workshop felt that support for the development of a sound plan and start-up funds from the federal government would be appropriate to provide a quick response to a pressing problem. The investment would not be great. If commuter systems developed in this manner proved successful in a few states, the level of risk would be greatly reduced. State, local or even private operators could be expected to start similar programs in other states without federal support. With effective intrastate or intraregional commuter networks serving the needs of the small communities, local service carriers could be permitted to delete subsidized points and eventually eliminate the need for federal operating subsidies. Thus small federal expenditures in a few states could lead to large national cost savings and improved transportation to many small communities. Federal support of limited experiments to demonstrate these concepts would satisfy the Workshop's recommendations on balanced but not necessarily equal treatment for low/medium density areas as well as the proper use of federal subsidy to demonstrate feasibility. Therefore, the Workshop recommended that

**The federal government should support state or regional demonstrations for improving transportation services to small communities.**

The Department of Commerce, through its Regional Action Planning Commissions, has made federal funds available to support a demonstration program in the southeast. Another is being proposed for the northwest. These programs may satisfy the Workshop's recommendation although they have not

been widely publicized to date. It is unfortunate that such vital transportation experiments are being designed and implemented without the participation of federal transportation agencies.

## POPULATION DISPERSION

Several Workshop participants argued that the federal government should support air service to small communities to help satisfy "the national goal of population dispersion." However, the Workshop was unable to find any more than offhand statements that such a goal actually exists. Although population dispersion was apparently announced as a goal in President Nixon's 1970 State of the Union Address, it has not been reaffirmed since that time, nor has any legislation or program been proposed to pursue this goal. In fact, Congressional and Executive programs to improve urban life would seem contrary to luring people away from the cities.

In addition, evidence was introduced at the Workshop that people don't want to relocate to smaller towns unless they are within a short drive of a major city. Movement is to the suburbs, not to the small or medium-sized cities.

From an economic standpoint, better transportation tends to concentrate rather than disperse populations. Good transportation allows industrial concentration, which means more jobs and leads to population concentration. Industrial concentration also leads to lower costs of production and a general benefit to the national economy. Adequate personal transport can do little more than expand the range of the suburbs around industrial complexes.

Therefore, the Workshop recommended that

**The DOT, with other government agencies, should determine if in fact population dispersal is a valid national goal and how transportation aids or detracts from that goal.**

This would be a good opportunity for DOT to exhibit the type of interagency leadership and coordination which the Workshop considers DOT's proper role.

## National Air Transportation Policy Issues

The next area of importance identified by the Workshop was national air transportation policy. Although not specifically relating to the problems of low/medium density air service, overall national policy for the air system does have a major impact on the low/medium density sector. In particular, policy at the national level that affects the three aviation segments serving the small markets will be considered: general aviation, local service carriers and commuter carriers.

### THE PROPER ROLE OF GENERAL AVIATION

After some debate about whether general aviation was a proper topic for the Workshop at all, it became clear that general aviation, although not public transport in the usual sense, does play a major role in providing basic transportation to the low and medium density points. General aviation representatives stressed its importance and suggested that general aviation might be paying too much of the air system cost in light of the benefits provided. They pointed to its significance in civil aviation, stating that general aviation accounts for 98% of all civil aircraft, 95% of all civil pilots and 79% of the hours flown and they cited the following public benefits:

- Transportation to outlying areas
- Recreational use of aircraft
- Derivative employment and trade opportunities
- Improved agriculture and forestry management
- Improved resource exploration
- Population dispersal and the spread of economic activity
- Backup capacity during national emergencies such as disasters or airline strikes

The issue, however, was whether the federal government (and general taxpayer) is spending more for these services than the value received, particularly in light of the limited amount of taxes that general aviation returns to the federal treasury.

Representatives of the DOT Cost Allocation Study stated that, on the basis of fiscal

year 1971 data, 29% of the total cost of the federal airports and airways system (\$331 million) should be allocated to general aviation. In contrast, DOT estimated that general aviation returns only \$63 million in existing taxes, leaving a \$268 million deficit. And that deficit is growing.

DOT recommended that a gradual shift to a more reasonable pricing system be made so that general aviation eventually pays for the costs it imposes on the system. The study office accepted general aviation's contention that parts of the federal system are "overbuilt" as far as general aviation's needs are concerned and, as a result, the DOT study recommended that general aviation not be charged unless the services are actually used. This requires moving away from the current tax structure toward a set of specific system user charges and fees that approximate the costs of the services received. (There is a minor problem in determining what services could be made optional and which ones must be required for overall system safety. This point was not pursued by the Workshop.)

General aviation proponents contended that the statistics used for the cost allocation study were fragmentary and insufficient. Also, they suggested that the federal government should not attempt to recover all the costs in view of the widespread public benefits of general aviation and the duty of the federal government under the Federal Aviation Act to "promote" civil aviation.

The Cost Allocation Study Office took strong exception to the latter argument, pointing to numerous other economic activities having public benefits neither receiving nor warranting taxpayer subsidy.

In light of all the confusion in this area, the Workshop recommended that

**The FAA and DOT should obtain better statistics on general aviation. The first step is to better coordinate existing data from various fragmentary sources. New data acquisition programs should then be initiated to provide missing information.**

This would permit a more informed assessment of general aviation's role and its use of airport and airway facilities. Agreement on the statistical base would remove much of the emotionalism of cost allocation.

In addition, the Workshop recommended that

**The evidence seems strong, even with faulty statistics, that some upward adjustment of general aviation payments is in order. But this should be gradual in order to avoid unnecessary disruption of activities that rely on the present system.**

The ultimate magnitude of the increase would be determined after an adequate statistical base is established.

### LOCAL SERVICE CARRIERS

Over the past decade, there has been a general trend for the local service carriers to acquire more jet equipment and long haul routes while gradually deleting smaller cities from their certificates. Whether or not this is desirable from the viewpoint of the small community, it must be recognized as an accomplished fact.

Three decades ago, it was perhaps appropriate to experiment with the feasibility of a specialized industry segment devoted solely to providing local or feeder service to and from rural communities on a subsidized basis. But with the passage of time and the development of commuter airlines more ef-

ficient in providing small community service, serious question is raised as to whether it best serves the nation's transportation objectives to retain the local service carriers as they exist today—a relatively weak class of carrier dependent on subsidy and entrusted with the task of providing small community air service, a task which they are no longer equipped to perform efficiently.

Rather than fight the trend and attempt to force the local service carriers to better serve the small community, a more rational approach is to give this class of carrier a greater opportunity for self-sufficiency and to rely on the commuters to provide more economical small community service.

As a first step, the locals should be allowed to delete uneconomic points which are non-isolated. There are several dozen of these points being served today which are not only an unnecessary drain on the carrier's systems and the public treasury, but also may not warrant any air service from any carrier. Second, as traffic growth permits, new routes should be awarded to the locals to strengthen their systems and aid in their transition to trunk status. Therefore, the Workshop recommended that

**The CAB should announce a policy of allowing gradual expansion and evolution of locals to trunk status as present ex-**



### **cess capacity is absorbed with the concomitant elimination of local service subsidies and deletion of subsidized points.**

Although the transition would take five to ten years, it should be announced as a policy as soon as possible to allow planning for the change.

At isolated points commuter replacements should be established to guarantee service without a subsidy requirement or at least with a lower subsidy than that required by the local service carrier. If subsidy is necessary, innovative techniques like the contract bid system, carrier flow-through, negative excise taxes and direct subsidy payments to commuters by the CAB or by local governments using revenue-sharing funds should be tried on an experimental basis in keeping with the Workshop's overall recommendation on subsidy. There is not necessarily one unique answer to this problem. Therefore, the government must be willing to adapt to each case with whatever innovative techniques will meet the local and national interests. At the same time, learning from the *Local Service Experiment*, the government must not allow the commuters to operate aircraft too large for their markets or to become totally dependent on federal operating subsidies.

### **Air Line Pilots Association Resistance**

Nationally, ALPA seems to be against local service carriers deleting points or entering into commuter substitution agreements. This is exemplified by the "Scope" clause in most local service carrier contracts that prevents the carrier from eliminating service to a point, either absolutely or through commuter substitution, without union approval. ALPA is also challenging the CAB's power to exempt commuters operating 30-passenger aircraft from detailed economic regulations. Its legal position in opposing local carrier and CAB action is based on highly technical arguments relating to Congressional intent in passing the 1938 Act. However, its philosophical position is that it is ALPA's duty to oppose any action that could adversely affect its members.

To overcome this opposition, it will be necessary to show that the general expansion of locals into trunks and local replacement by commuters is in the union mem-

bership's advantage as well as the carriers'. Allegheny's experience is clearly an example in point. The Allegheny Commuters feed more traffic into the system which means more pilots and aircraft are needed. And since the new local service aircraft are jets, the crews actually upgrade their status and pay.

Another possible solution suggested at the Workshop, although fraught with inter-carrier and inter-personnel problems, was that local crews furloughed by a commuter substitution would be hired by the commuter as part of the substitution agreement. Crew members would retain their positions on the local carrier's seniority list and would be recalled when system growth warranted it. While serving with the commuter, crew members might receive a higher salary than the commuter would normally pay, the difference being paid by the locals.

Clearly the potential of upgrading the status and pay of ALPA or other union members that would result from transitioning locals into trunks would ameliorate the union position. Where this potential is not readily apparent to the union or its members, other approaches will have to be explored.

**Community Resistance** Some communities resist their deletion from a local's certificate, usually because of community pride and a distrust of the commuter operator who might serve as a replacement. After the transition takes place, however, most communities are pleased with the more frequent and timely service the commuter offers. Community education is needed to ease the transition.

Small towns must realize that they will never be able to support frequent service with large aircraft, even with large subsidy support, and that it is in their best interest to accept and support frequent and reliable service in smaller aircraft rather than the infrequent ill-timed large aircraft service now offered by many local carriers. An enthusiastic public relations campaign by both the local and the commuter, accompanied by the documented experiences of other communities where commuter replacement has been a success, would probably be enough to gain local support.

**Financing Problems** The Workshop dis-

cussed other problems facing the local service industry, primarily related to financing their potential growth. Among those presented were limited return on investment and erosion of the equity base.

It was alleged that, since the CAB limits the rate of return on subsidized service to between 8 and 10%, carriers could not afford to purchase new aircraft for these markets at today's high interest rates. The return would not cover current investment costs. As a consequence, even those carriers who would like to upgrade the quality of their service are forced to continue using their old turboprop equipment. Although this problem would be eliminated if subsidized local service is phased out, it was argued that the CAB should realize the unreasonableness of its rate of return standards and allowable business deductions in these markets during the interim period while the carriers are moving toward trunk status.

Basic CAB rate making policy allows the carrier a rate of return on his investment base that, in theory, is sufficient to attract investors to the firm and also make debt financing attractive to lending institutions. This policy allowed the local carriers to accumulate a small but growing equity base over the first twenty-five years of their existence. Then between 1967 and 1972, this equity base was totally eroded by poor earnings and increased costs. Most local carriers accumulated a debt of several times their original equity position, making it difficult to attract new equity capital. This forced them to lease rather than purchase new aircraft. Traditional rate of return/rate base regulation limits carrier profits to a fixed return on investment. Leased aircraft, not included in this investment base, hypothetically limit profits and slow recovery.

Two solutions were proposed to the Workshop. The first was the inclusion of the capitalized value of leased equipment in the rate base, rather than allowing the deduction of interest costs as a business expense. This would increase the size of the rate base and subsequently allow a higher dollar return. The second recommendation was the abandonment of the rate of return/rate base method of rate making and the substitution of the operating ratio technique that bases profits on revenues and expenses rather than on the investment of the firm.

However, since the financial health of the

industry seems to be increasing dramatically now that the effects of earlier route strengthening are being felt and since the Workshop had recommended a policy of encouraged growth and increased route strengthening, it was not felt necessary to take a position on these issues.

## COMMUTER CARRIERS

Information presented at the Workshop indicated that commuters are being unnecessarily handicapped by their continued confusion with general aviation by both the public and government alike. Many government branches include the commuter air carriers in general aviation statistics, adversely affecting their identification as part of the air carrier system.

Some airport operators, particularly at larger hubs, shunt commuters to less favorable terminal or gate positions. In some instances, commuters are forced to use general aviation facilities which can be quite remote from the air carrier terminals. This places a particular burden on the commuter who specializes in connecting traffic and feeding passengers to the certificated carriers.

Aviation suppliers, such as fuel distributors, often treat commuters separately from air carriers in allocating fuel, a serious form of discrimination. Airport operators may force commuters to purchase fuel from the fixed base operator at the field rather than allowing them to negotiate their own fuel contracts. This problem is so severe in some areas that commuters must offload passengers to carry fuel purchased at outlying airports to avoid paying premiums at the hub (if indeed fuel is available at all).

Finally, commuters are denied access to several valuable industry collective arrangements. These include the listing of single-plane and connecting schedules in the Official Airline Guide and inclusion in tariff publications (a particular problem to freight carriers), interline traffic and comprehensive joint fare arrangements.

Collectively, these discriminations have a significant impact on the current operations of commuters and their potential growth. To overcome these discriminations, the Workshop recommended that

**The DOT, FAA and CAB should officially**



**recognize and endorse commuters as a vital segment of air transportation not essentially different qualitatively from certificated air carriers. The federal agencies should impress these attitudes upon state, local and airport authorities as well as influence the certificated carriers to adopt more cooperative arrangements with commuters.**

**There should be a total and complete dis-association of commuters from general aviation and air taxis, including separate regulations where appropriate.**

**Commuter Finance** Like the local service carriers, the commuters were quick to raise their financial problems. To date, the commuters have been financed from three main sources

The owner/operator — Quite often the commuter owner/operator has been a fixed base and/or air taxi operator in the region. His expansion into a scheduled commuter carrier has been underwritten by these other activities.

High-risk investors — People looking for quick profits or tax write-offs were often attracted by the "glamour" of owning part of an airline

Community support — Businessmen of the town provided initial financing because of a desire for better service.

However, these sources are all limited and to finance the next generation of aircraft and expansion the commuters will have to rely on the more traditional sources of equity and debt funding

The banking community tends to look at the commuter like any other business. If the carrier can show good management, a solid financial base and an adequate product line (a strong route structure in the case of the commuter), there should be little trouble attracting debt or equity capital. Contrary to the belief of some commuters, a sound business — not guaranteed loans, certification or other governmental support — is the major criterion.

It was suggested that commuters might finance their activities through local banks rather than relying on the larger banks which have provided the bulk of the local service and trunk financing. Since the commuter is known in the community, he may be able to get better terms locally than from some remote source. Local financing has a

second important aspect: it involves the banker and the community in the commuter's activities and increases their interest in his success. This should promote the commuter's traffic and growth.

**Federal Certification** Several commuters claimed that problems of recognition and access to finance could be cured if the commuters were granted some form of limited certification from the CAB. It would protect their routes from "predatory competition" and improve their image. But at the same time, they did not want the detailed fare, merger and other types of economic regulation that traditionally accompany the grant of a monopoly route by a regulatory board. In short, they wanted the benefits without the burdens

The classic argument was that a commuter carrier would not devote its limited cash and resources to develop a marginal market if someone else could step in and split the profits. However, this argument could be made by any businessman. In our competitive system, a successful business will alert others to the potential for profits, inviting competition. This is usually praised as a major asset of the American competitive system. It can be argued that, unlike other businesses, air service is essential. Yet we do not give certificates to grocery stores, clothing stores or other businesses perhaps more essential to the public good, even if they are the only store of their kind in a small town

The commuters' predatory competition argument took two forms. The first was that entry in the commuter industry is so easy that inexperienced operators, unable to estimate the market, will buy an aircraft, enter a market able to support only one carrier, split that market and eventually force both out of business.

In countering this argument, it should first be pointed out that this is not predatory competition at all, but normal competition in most markets, faced day in and day out by the vast majority of American businessmen. Second, there are few examples of this actually occurring. In general, operators are not so foolish as to compete with an established carrier in a thin market unless that carrier is not providing adequate service. Even where competition is encountered, one carrier will usually have greater staying power and eventually emerge with control of

the market. It is unlikely that another new competitor would immediately start the battle over again. Third, even if both competitors fail, the market can support one carrier and no doubt another will appear to fill the void. Even if the federal government has a duty to ensure that service is provided, it should have no duty to ensure that the service is provided by a particular carrier. Finally, if the community is concerned with interruptions in service or lack of continuity, it can support the carrier it prefers, through either direct or indirect subsidies.

The second argument for protection was based on predatory competition in the economic sense which occurs when one carrier, because of superior assets, prices its services below costs until it depletes a competitor's assets, drives him into bankruptcy and then raises its own prices to the monopoly level, recovering losses and at the same time gouging the public.

This argument runs counter to the first. If entry into the commuter industry is as easy as stated in argument one, then the predator has little guarantee of retaining his monopoly and engaging in monopoly pricing long enough to cover the losses incurred while driving the earlier competition out of business. Since the carrier cannot count on recovering losses, much less enjoying monopoly profits, the chances of true predatory competition in the commuter industry are very small. Further, even if truly predatory conduct does take place, remedies may be available under existing anti-trust law. Since commuters are exempted from regulation by the CAB, they do not possess CAB-supervised anti-trust immunity like certificated carriers.

Commuters who were against certification raised several objections. First, the costs of regulation, even if not full certification, are prohibitive. One operator estimated that legal fees alone for participation in one CAB proceeding added \$250 to his hourly operating costs for the entire year.

The second argument was that limited certification would eventually mean full regulation at some time. This would mean limited profits since the CAB establishes the appropriate rate of return. It would also mean lack of flexibility. A carrier would no longer be able to enter and leave markets at will, experiment with fares or do many of the other things that have brought success to the commuters.

After considering these arguments and the admittedly erratic but steady growth of the commuter industry, the Workshop concluded that certification is not in the best interest of the industry at this time and would do little to achieve the desired goals of recognition or better financing.

Indications are that the industry is on the verge of proper recognition and, with little additional federal effort (as recommended by the Workshop), the commuters could be accepted as full partners in the air transportation system without the burdens of certification. The financial community gives little weight to either certificates or government guaranteed loans in deciding whether to finance or not. And arguments for protection from competition were considered invalid by the Workshop. (One banker queried before the conference said that what the commuters needed was not protection from competition, but protection from themselves and their own bad business practices.) Therefore, the Workshop recommended that

**The commuter industry should retain its unregulated free competition status.**

The Workshop was appraised of potential court decisions that could invalidate the CAB's ability to exempt commuters from regulation. With this in mind, the Workshop also recommended that

**If regulation is forced upon the industry by the courts, Congress should enact specific legislation to exempt commuters from regulation or amend the Federal Aviation Act of 1958 to allow the CAB to insert conditions in commuter certificates that essentially retain the present Part 298 in another form.**

If deregulation by statute is not desired, the authority of the CAB to place conditions in commuter certificates is essential. Under the current act, the CAB cannot directly control the aircraft type or size used by a certificated carrier. This must be changed if the commuters are to be prevented from following the transition of the local service carriers into aircraft too large for small community service.

A presentation made to the Workshop indicated that the legislative changes needed to grant conditional commuter certificates

are minimal. Since the Board already has the power to grant certificates with conditions to supplemental air carriers, the sections of the act governing supplementals need only be expanded to include commuter air transportation.

**State Regulation** All the comments and recommendations concerning federal regulation of commuters apply equally well to state agencies. In the view of the Workshop, the long range environment for commuters should retain as many as possible of the freedoms they now have and subject them to as few as possible of the regulatory burdens. Under the present system, commuters have been able to serve air transportation needs as the marketplace directs with little artificial interference by the government. The commuter is able to react and adapt to changing circumstances, maintain lower costs, provide higher frequencies and, as a result, compete not only with other air carriers, but also with alternate modes of surface transport. It is vital in this respect that the state regulatory agencies do not, through new and burdensome regulation, destroy for these carriers the advantages now existing under federal regulatory philosophy.

In the Workshop's opinion, the proper role of the state agencies is to plan and promote the transportation system. Regulation should be applied only where there are truly local, intrastate problems that cannot be solved by any other means. Where intrastate authority is used as an excuse to modify situations or policies of interstate commerce with which the state does not agree, there is a clear abuse of power and conflict with federal authority. Congressional action may be necessary to correct such abuse.

## **JOINT FARES**

As mentioned previously, commuter carriers complained bitterly of their inability to enter into general joint fare agreements with certificated carriers and to have the joint fares they do establish published in the proper tariffs. At the present time, each commuter joint fare in each market must be separately negotiated with each participating certificated carrier.

Historically, joint fares were a competitive device whereby two carriers could provide a connecting service at a competitive price in a market served directly by a third carrier.

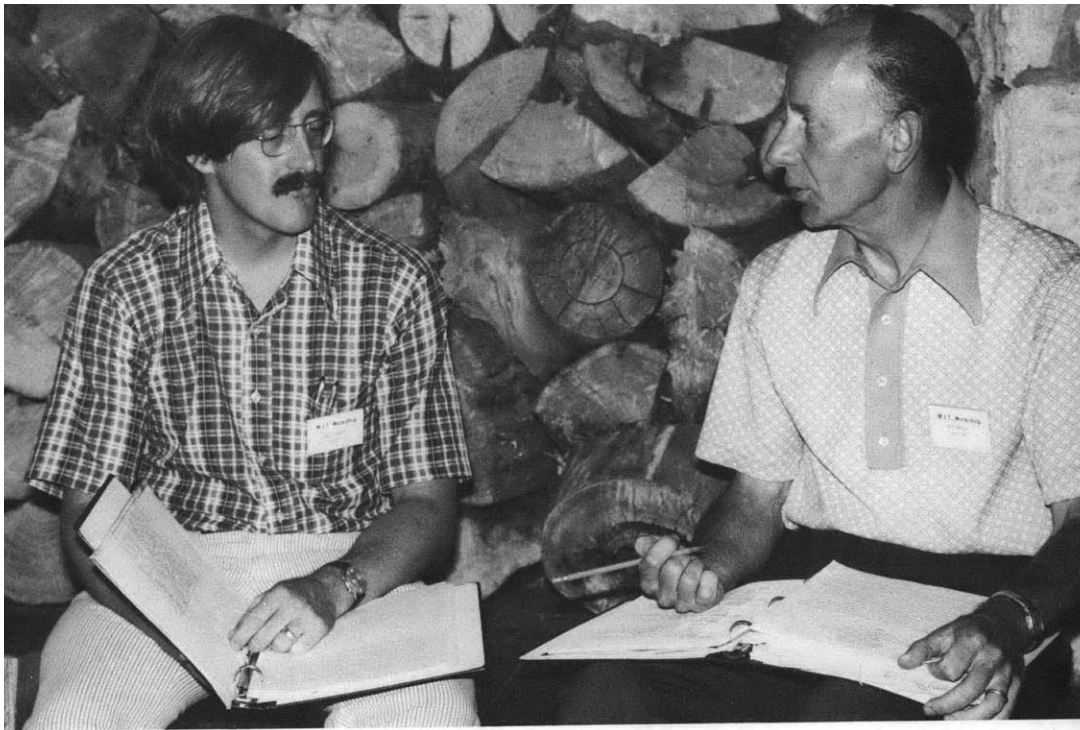
For example, Northwest Airlines has the only direct route from Billings, Montana, to Washington, D C. Western with Billings-Denver authority and TWA with Denver-Washington authority have entered into a joint fare agreement that offers connecting passengers fares competitive with Northwest. The resulting joint fare is considerably below the sum of the individual fares for the Billings-Denver and Denver-Washington segments.

More recently, there has been a focus on the advantages of joint fares to the traveller as well as to the carriers. One presentation to the Workshop made the point that joint fares to date have been a tool for diverting traffic from one carrier to others. However, they could also be a tool for traffic generation. The presentation pointed out that a nationwide system of joint fares, while perhaps slightly diluting yield as compared to direct service over any segment, would stimulate overall traffic growth to an extent that would more than offset any losses.

Since joint fares both increase carrier competition and stimulate growth, the Workshop endorsed the action of the CAB in the Domestic Passenger Fare Investigation, holding that certificated scheduled airlines must establish joint fares in all markets over all routings. This action provides travellers with generally available joint fares in all certificated markets irrespective of their previous historically limited use in competitive situations only. In addition, the emphasis on joint fares will probably result in fewer tariff-quoting errors, an area of consumer concern.

Many of the benefits of joint fares between certificated carriers would result from certificated carrier-commuter joint fares. However, the Workshop was not ready to recommend the mandatory institution of such a program by the CAB at this time. The National Air Transportation Conferences (NATC) has petitioned the Board for a hearing on this matter so all the factors can be explored. The Workshop encouraged the Board to proceed with this hearing as soon as possible.

At the present time, the CAB could lend its support to a broadening of the current voluntary arrangements between the certificated and commuter carriers. In due course, after added experience with the new certificated carrier joint fare policy and negotiated joint fares between commuters



and certificated carriers, further action may be indicated.

### **COUNSELLING COMMITTEE ON AVIATION**

Several times throughout the conference, the DOT was criticized for formulating plans or programs in a vacuum and inviting comments and criticisms only after it was too late to redirect the effort to incorporate suggestions. One way to avoid this would be for the Secretary of DOT to have at his disposal a Counselling Committee on Aviation to provide a sounding board and assist him in evaluating the content and timing of system planning proposals and to recommend the initiation of new proposals where required. The committee would be comprised of experts from industry, academia and other institutions with a broad background of diverse experience and would be an ongoing activity — not organized to write a report and then disband. NASA and other agencies have used such groups to great advantage (although not without some criticism) and DOT could learn from their experiences.

Shortly after the formal sessions of the Workshop, several industry leaders formed such a group to advise the Administrator of the FAA on issues of importance to short haul air transportation. The Workshop

supports and encourages the expansion of this concept to other modes and offices within the Department of Transportation.

### **Low/Medium Density Air Transportation Policy Issues**

Having discussed the more general topics of national transportation policy and overall air transportation policy, the Workshop considered its central topic, the problems and issues of air service at low and medium density points. Underlying the discussion were questions which should be kept in mind. What is the benefit of air service to these points? To the extent that the service costs more than the revenues received, who pays the excess (subsidy)? And how should the payments be made if needed?

### **COMMUNITY NEED FOR AIR SERVICE**

"Community" was used in a broad sense, including state and regional areas when applicable as well as local cities or towns. In isolated areas, air transportation may serve a large geographic region even though the airport is in one particular town.

Communities justify their need for air service on four basic grounds: community pride, economic development, population dispersion and isolation.



**Community Pride** Many communities want air service because they think it helps create the image of a progressive modern town. Like good schools, paved streets, properly trained police and fire departments and other local amenities, air service helps people identify with their communities in a positive way. But it should be noted that the benefits of community pride accrue primarily to the residents of the particular community.

**Economic Development** Although some studies have claimed that the mere provision of an airport in an area is enough to spark economic growth, evidence presented at the Workshop indicated that neither airports nor even regularly scheduled air service are in and of themselves sufficient for economic development. Unless there are other factors such as access to materials, an adequate labor supply and the proper tax structure, air service will not induce new industry to an area.

Enough evidence was presented, however, to convince the Workshop that air service can be an important factor in attracting new industry to a town and that many communities, although they offer all the other inducements to new industry, have

been eliminated from consideration by a firm seeking relocation because of inadequate air service. Thus air service is often a necessary, though not solely sufficient, condition for the economic development of a region.

But again, who benefits from this development? A century ago, the federal government financed the expansion of the railroads because the ensuing development of vast agricultural and mineral resources benefitted the country as a whole as well as each new region settled. Today, with the possible exception of opening Alaska, improved transportation facilitates the movement of products, people and goods, but does not stimulate national growth by unlocking new national resources. To the extent adequate transportation allows a firm to locate where its costs are the least, a national goal of economic efficiency is promoted. However, the national gain is small compared to the direct benefits to the community brought by industrial relocation.

By the communities' own admissions, they generally want modest expansion by low-polluting industries with growth limited to perhaps 3 or 4% per year. Thus the industry they seek is often light manufacturing. In general, such firms are already in

business and are looking for a new location because either the labor force in their area is inadequate or expensive or local taxes are rapidly increasing. Thus the decision to leave town A is already made. When town B is selected over town C, the economy of town B grows, but at the expense of towns A and C. Thus, from a national perspective, most of the benefits of community economic development are transferred from one region to another, providing little overall national benefit that would not have accrued if some other relocation decision had been made.

**Population Dispersion** As an adjunct to economic development, the communities point to population dispersion as another benefit of air transportation. As was mentioned in an earlier section, it is not clear whether population dispersion is a national goal or whether better transportation aids this goal. In addition, when a firm moves from the big city, it normally brings only a few key personnel with it (perhaps increasing unemployment in the city left behind). The bulk of the positions are filled from the already-formed local community since one reason for the move is usually an adequate labor supply in the area. In fact, there is some evidence that the location of a new business in a town actually concentrates population since people are lured from the farm and other nearby small towns because of better jobs. So perhaps the most that can be said is that economic development may keep some people from leaving the community for larger cities and thus helps prevent further concentration in large urban areas.

**Isolation** Perhaps the most difficult argument to assess is the community's need for air service because of its isolation. And the small isolated community is often the least able to pay for the service it receives. In fact, air service may be the most economical transportation to these communities. It was estimated in the Canadian Ontario experiment that air service to four communities for one year costs less than one mile of highway construction.

Few would question that air service improves life in these communities, if by nothing more than providing faster access to medical service when needed. But again it is hard to quantify what benefits accrue to the

nation as a whole as compared to the inhabitants of the isolated community.

In summary, the Workshop was convinced that air service is needed by small communities for a variety of valid reasons and, to the extent that revenues do not cover costs, in some cases it should be subsidized because of the intangible benefits it offers to the local community. The Workshop was not convinced, however, that the federal government should pay these subsidies, since little overall direct national benefit accrues from service to small communities.

## **OTHER JUSTIFICATIONS FOR FEDERAL SUBSIDY**

In addition to the arguments of community need and population dispersal, at least five other arguments and counter-arguments were identified for federal subsidy of air service to the small community.

**Infant Industry** As recommended by the Workshop, federal subsidy may be justified to encourage a new transportation experiment for a limited time. One reason for such an experiment would be to encourage and accelerate the growth of a new industry. This would justify the inception of the local service experiment in the 1940s. However, after 30 years, the industry can no longer be considered infant nor can subsidies for air service to small communities be considered an experiment. Any town on a local service carrier's certificate that would have responded to air service and grown into a self-supporting point on the carrier's system has long since achieved such status and it is unlikely that any community that has not ever will.

**Transportation as a Public Function** The federal government has historically supported certain aspects of transportation for various periods of time. There is also a tradition as old as the Roman roads of governments providing facilities to improve transportation beyond the normal scope of private investment. Yet there is no legal obligation to provide federal support for local transportation problems. And the growth of user charges indicates a federal movement away from outright grants of transportation funds.

**Urban-Rural Equity** Air service to small communities may be subsidized on the

grounds that urban mass transit is subsidized but, in keeping with the Workshop's overall subsidy recommendation, perhaps neither should be. Also, the connection between subsidized urban mass transit and nationally proclaimed goals is clearer. Mass transit improves the general environment by getting people out of automobiles. It aids the poor, enabling them to have access to better jobs and thereby reducing welfare and unemployment payments. The poor are also heavily dependent on mass transit for access to medical and educational facilities. In contrast, air subsidies have little connection with announced national goals (although they do benefit local communities). The air traveller is more often not poor but relatively high on the income scale. And last, those who benefit directly from mass transit far outnumber air travellers on subsidized routes

**National System Benefit** The subsidized system feeds passengers onto the unsubsidized system, spreading fixed costs over more passengers and thus lowering overall air transportation costs for all passengers. However, most economists doubt that the unsubsidized air system is characterized by such "increasing returns to scale" beyond those presently realized. Secondly, the primary benefit of the feeder traffic accrues to the airline company and its stockholders. Benefits to travellers in general are remote and difficult to trace. Finally, if the government wanted to lower overall travel cost (again, it is not apparent that this is a national goal), then the most efficient way to do so would be to subsidize all carriers directly and not depend on secondary effects

**Public Benefits of Availability** The general availability of air service is an asset to the community and its people, even if never used. This is most certainly true but, again, it is an asset to the community, not to the nation in general

In summary, the Workshop found many good reasons to justify subsidy to air service at small communities, but not directly by the federal government. It therefore recommended, in keeping with its general recommendations on subsidy, that

**Direct federal subsidy of air service to small communities should be eliminated**

**and the responsibility for subsidizing air transportation, where necessary, should be delegated to the lowest governmental level capable of assessing the costs and benefits of this service.**

This would put the burden of subsidy on the community, if community pride is the benefit they perceive. If economic growth is the benefit, then the town, county, state or even region that benefits from that growth should subsidize. If isolation is the concern, then again the town, county, state or region concerned should pay for the service.

The immediate question raised was how will they pay? The present revenue sharing plan is an excellent source of funds since they are uncommitted. The community can decide how to spend the money and, if air service has high enough priority, it will be supported. If it does not have a high priority to the community, that is all the more justification for eliminating federal subsidy payments

The second comment was that local subsidies would result in random patterns of service and not in an integrated air transportation system. First, the Workshop doubted if this would truly occur because communities would buy service to cities with good air service as well as other communities of direct economic interest. Other connections would not be essential. Second, the Workshop stressed the need for DOT leadership for integrated national, state and local transportation. This would eliminate many of the anticipated problems.

**Change in Federal Policy** If the federal government decides, contrary to the Workshop's recommendations, to either announce a federal policy of providing air service to small communities or to run subsidized experiments, then the Workshop recommended that

**Under any new federal subsidy proposal, the government should concentrate on minimizing costs for a specified service level or maximizing service for a specified subsidy level.**

To do this, the Workshop suggested that the government specify the service desired and not the operator, test new subsidy payment techniques, insist on local cost sharing to assure community interest, make subsidy



predictable over a period that allows adequate operator planning, and establish and enforce community eligibility standards. The latter point would require measurable criteria for subsidy such as isolation, minimum required passenger enplanement levels in response to the service (strictly enforced), a maximum cost per boarded passenger and/or passenger mile, local cost sharing (plus some expression of democratic popular support through the use of revenue sharing funds, a referendum or similar technique). Only such action can place federal subsidy on any reasonable basis if Congress decides to continue the program

## Technology Issues

Pervading and cutting across policy issues at all levels is technology. At any time, a technological breakthrough could obsolete not only our thinking, but also an entire mode of transportation. In the low/medium density air transportation area, however, technology exists that could improve both the quality and the cost of service. The problem is applying that technology to the market in a cost-effective way

### AIRCRAFT

The major issue raised at the Workshop was whether the federal government should sponsor development of a new family of small quiet aircraft to serve low/medium density markets. A first concern was whether a new aircraft, using currently available technology, could provide improved service to low/medium density markets at lower costs. The secondary issues were what this aircraft might be like. Would the same aircraft meet the needs of commuters and locals? Should it be turboprop-powered or jet? Is STOL capability required? Can used aircraft satisfy the need? What environmental characteristics are acceptable?

Addressing the secondary issues first, the Workshop came to the conclusion that low/medium density market characteristics are quite diverse and, as a result, have a variety of aircraft needs.

**Local Service Requirements** There are some points on the local service systems that generate so little traffic that they cannot be profitably served by any aircraft. At the other extreme, as a result of the route

strengthening policy of the 1960s, over 50% of the local carriers' revenue passenger miles are now generated on long haul routes adequately served by current jet aircraft like the DC-9 and 737. The difficult area for aircraft requirements lies in between these two extremes — markets now served by the carriers' aging turboprop equipment. Local carriers expressed an interest in a 50 to 70 passenger jet for these markets, but thought the cost of current aircraft in that size range (all foreign) was too high. Several studies by manufacturers supported this position. M.I.T. and Frontier Airlines studies indicated that a 40-passenger jet could fit into a local service system and increase carrier revenues and profits. This aircraft would replace DC-9s or 737s on thinner jet routes and Convairs on high density turboprop routes. However, these markets are already profitable and presently receive adequate service. The end result would be higher carrier profits and better service to points already self-supporting, but no reduction in cost or improvement in service to subsidized markets—the real area of concern at the conference

**Commuter Requirements** Most commuters operate small aircraft, particularly in low/medium density markets. In the quarter ended June 30, 1971, there were 782 aircraft in the commuter fleet, but only 189 were turboprop-powered and none were pure jet. The bulk of the remaining 593 aircraft were small single-engine and light twins. Although commuter operators in small markets expressed a desire for a less expensive, more rugged 10-passenger aircraft, there would be little commonality between it and a 40-passenger jet.

There may be a need for a larger 20 to 30 passenger aircraft by commuters operating in high density markets, particularly as air traffic control slots at hub airports become more limited. Again, however, these are not the types of markets that the Workshop was established to address.

**Turboprop vs. Jet** Local service carriers are committed to jet fleets. Commuter carriers, however, put jet power very low on their list. They are much more concerned about economical operation, low purchase price and performance characteristics. If a jet can match the turboprop in all these areas, then the commuter will buy it. But if it

cannot, business sense dictates turboprop power

Discussions of passenger preference at the Workshop led to a similar conclusion. Passengers in the low/medium density markets would prefer to ride jets, but other factors such as schedule convenience, reliability, dependability and costs are more important. Again, all things being equal, the passenger would select a jet. If factors are not equal, however, he will choose the turboprop's lower cost

**Other Concerns** Environmental requirements, the need for STOL capability and the like depended heavily on the specific markets served. In most cases, low density points were not noise or pollution conscious. Because of lower population densities, large open land areas around airports, predominantly small aircraft and fewer overall aircraft movements, there was little community complaint. The opinion was expressed that hearing the aircraft actually made people feel good since it reminded them they were getting service

Although STOL capability can have a large economic impact on short haul operating costs by reducing taxi and maneuver time, STOL need was based more on geographic considerations than anything else. Airport and runway cost reductions were sometimes considered for introducing STOL in very low density isolated markets where air access was needed to provide emergency relief and medical service. It was suggested at the Workshop that state and regional planners in these areas should investigate the total system cost of providing such services and consider VTOL service with its lower facility cost, although admittedly higher operational costs, as an alternative. However, the institutional structure of the United States air system makes this total system approach difficult. In general, the federal government owns and operates the airways and navigation facilities, state or local governments own and operate the airport and associated facilities, and private industry owns and operates the aircraft in the system. Each attempts to minimize his own costs (often at the expense of the others) and there is no overall authority to keep the total system in balance.

Having examined these secondary issues, the Workshop concluded that several diverse types of aircraft are needed to serve diverse

markets. There would be little commonality and, as a result, there would be small production runs and correspondingly high aircraft prices

Returning to the primary issue of whether the government should finance the design and/or development of such an aircraft, the Workshop concluded that this could not be justified at this time. A new 30 to 50 passenger aircraft is too large to improve service or lower costs at low density subsidized points. Used in medium density markets, it could improve the profitability of local service carriers but improved private profits are not a legitimate reason for federal subsidy. It was argued at the Workshop that the increased profits from a new aircraft used on medium density routes could cross-subsidize low density service, reducing operating subsidy and thus justifying government financing of aircraft development. However, even if cross-subsidy is desirable (a disputed point), it can be achieved at less cost to the government through route awards or fare increases in non-subsidized markets.

**International Considerations** Although not directly connected to the topic of service to small communities, the Workshop briefly discussed whether the development of a family of small jet aircraft could have international implications such as helping to retain United States leadership in international aviation, contributing to the balance of payments and serving a humanitarian goal of applying U.S. technology to improving air transportation systems in developing countries. The Workshop agreed that such public policy goals might be satisfied by a new aircraft and might even justify federal subsidy of aircraft design and development, particularly because foreign aircraft being developed for these markets are receiving backing from their governments. It was also suggested that such aircraft might be used by the military if a compromise design could be developed between the military's desire for high performance and the airlines' need for economic operation. But these issues were beyond the scope of the conference and not enough information was presented on which the Workshop could base a conclusion. Therefore, the limited recommendation of the Workshop was that

**Although foreign trade and international leadership concerns might justify gov-**

**ernment subsidy of the design and development of a family of new small jet aircraft, such a program cannot be justified on domestic considerations alone.**

**Research and Development** Although the Workshop concluded that the federal government should not fund the design and development of a commercial aircraft for domestic markets, it did feel that the government should continue its basic research and technology programs that might ultimately lead to commercial applications. However, no new high technology programs in the traditional sense are needed to support the development of aircraft for low/medium density markets. The spin-off from current programs, which should be continued, is sufficient. Instead, programs are needed to apply existing technology and to stimulate the private sector. Studies on "design to cost" techniques (where the basic product and cost are specified and the engineer must meet both constraints), new manufacturing methods and new low-cost materials are also needed. Therefore, the Workshop recommended that

**Studies are needed on "design to cost" engineering, new manufacturing techniques and new materials to stress low cost and reliability rather than high cost technology.**

## **AIRPORTS**

Airport problems were viewed from two perspectives, that of the airport operator and that of the air carrier. In general, the local carriers have had few problems because of their size and status. Therefore, the Workshop concentrated on the interface between commuters and airport operators.

**Problems of Low/Medium Density Airport Operators** The small airport operator does not face the types or magnitude of problems of the larger airports. In general, his major task is maintaining good public relations with the electorate who often control airport financing in smaller cities and towns. Since traffic is relatively light, the operator must pay close attention to his costs and be sure that users of the facilities pay their allocated share of the costs incurred. This includes concessions and services, which can be a valuable source of income when

tailored to the public's needs

Because of available land and few large aircraft operations, the small airport does not usually face a severe environmental problem at this time. The operator should use this opportunity to purchase enough land before development begins to protect himself for the future

Perhaps the most difficult problems facing these airports are the federally-imposed security and certification requirements which are essentially beyond the control of the local operator. If these can be anticipated and designed into expansion plans, the operator can maximize ADAP revenues to offset some of these costs. Some communities have entered into joint use agreements with military bases as a way of deferring costs since the military often provides essential security and emergency services. This solution depends on the geographic availability of military facilities and is often less than satisfactory since the community is in a weak bargaining position and must frequently take whatever is offered

Failing any of these methods of offsetting federally-imposed costs, the operator must use either operational funds or seek additional funds from the electorate. If such funds are unavailable, then the airport faces closure. Federal cost sharing may be justified to prevent this if public benefits can be demonstrated.

## **Problems of the Commuter Carrier at Low/Medium Density Airports**

Other than those general problems discussed in the section on National Air Transportation Policy Issues, the commuters face little difficulty at the small airport. There is generally enough ramp and apron space near the terminal and gates to satisfy their needs. Terminals are often designed for people, not aircraft, allowing easy interchange of passengers and baggage.

The biggest needs of the carrier at the small airport are dependable landing and navigation aids that would improve both safety and service reliability.

## **Problems of Medium/High Density Airport Operators**

A majority of passengers boarding at low/medium density points travel to a medium or high density point and thus must be integrated with the traffic at the larger hub. Since the passengers brought to a hub by a commuter airline are only a small

percentage of the total passengers using the airport, their needs are often forgotten during the airport planning process.

The problems of the airport operator are both environmental quality and runway and gate capacity. He has difficulty meeting the needs of the certificated carriers much less those of the commuters.

### **Problems of the Commuter Carrier at Medium/High Density Airports**

The commuters operating small aircraft contended they are treated like a fully certificated air carrier in the air but like a second class carrier on the ground. At most airports, they enter the traffic patterns and are handled indiscriminately from a 747 by air traffic control. But after landing, they claim they are shunted away from the carrier facilities and forced to use the general aviation terminal at the far end of the field.

In fact, the commuters' needs are just the opposite. They want expedited air traffic control procedures taking advantage of the characteristics of small aircraft, using short or non-duty runways and avoiding the general traffic patterns. Where this has been tried, it has worked successfully, but to date it has been at the discretion of local tower personnel. A change in tower management can eliminate these special procedures.

On the ground, commuters need access to cargo and passenger terminals since

most traffic is interline. They need counter space in terminals that is not relegated to the luggage pickup or rental car areas. They need equal access to services. Since earlier recommendations covered many of these problems, the Workshop did not make specific recommendations in this area. In general, progress is being made by the airport and commuter operators which should improve airport problems from both perspectives.

## **OPERATIONS**

The third area of technological concern was system operations. Two major sub-topics were identified — air traffic control and safety. These are both very large and controversial subjects but the discussion was limited to the specific impact on low/medium density markets.

### **The Cost of the Air Traffic Control System**

This topic was triggered by the Cost Allocation Study. As long as the ATC system was free, people wanted more of everything. Now that users may have to pay for services, they are questioning the cost and utility of various functions.

The particular fear of operators in the low density markets (primarily general aviation) is that the present ATC system, designed primarily to serve the high density terminals,



will spread to low density airports where its high cost features are unneeded

A second subtopic was the FAA's over-reaction to some safety topics. The example used was the disproportionate sums spent on collision avoidance systems compared to prevention of accidents during approach and landing when the majority of fatal incidents occur.

The Workshop's recommendations were that

**The FAA should not extend the full high density ATC system to low density points and it should drop services that users do not wish to support financially.**

**The FAA should balance safety with cost effectiveness in low density areas.**

#### **Air Traffic Control Procedural Problems**

At the high density ends of low/medium density market service, the capabilities of the smaller commuter aircraft to make steep or angled approaches are often not used. Although approach standards are presently different for large and small aircraft (obstruction clearance area sizes are larger for large aircraft which require greater turning radii, are less maneuverable, etc.), approach procedures could be developed to take advantage of the characteristics of smaller STOL or light aircraft without compromising safety. If these capabilities were used, it would aid in traffic flow at higher density points. Studies have shown that there would be no problem separating small aircraft with operational capabilities and field length requirements that differ from large CTOL aircraft at major hubs, although ATC operational changes might be needed (e.g., separate controllers). Therefore, the Workshop recommended that

**The FAA should develop separate approach procedures for large and small aircraft.**

These procedures can be expanded to include rotary-wing vehicles as their use increases.

Commuter carriers claimed that they experience as much delay at isolated airports as in major hubs because of inadequate radar coverage, lack of local control authority and interference from local IFR train-

ing. The ATC centers concentrate primarily on their hubs. Although it is possible to work out local procedures, the incentive has had to come from the carriers. There has been too little coordination between the ATC centers and the low density terminals.

The commuters were also concerned about operating IFR in uncontrolled airspace. Civil aircraft may legally operate VFR in the same airspace if clear of the clouds and the visibility is one mile. The commuters would like control zone protection which would require at least three miles visibility for VFR.

To improve these situations, the Workshop recommended that

**ATC centers should initiate letters of agreement and local procedures at low density terminals.**

Controllers might hesitate to use local procedures because they don't know if the user is familiar with them. Therefore, the Workshop recommended that

**The FAA should publish local procedures in the Airman's Information Manual.**

#### **Air Traffic Control Equipment Needs**

Although equipment is satisfactory at high density terminals, an automatic direction finder (ADF) is often the only approach aid at many commuter air terminals. (Many pilots consider an ADF approach to be emergency procedure only.)

Area navigation is considered essential for low density air transport to provide direct routing and approach capability to small airports not served by an approach facility. VOR/DME coverage is almost nonexistent in high mountain regions and very sparse in many low traffic areas. Very low frequency (VLF) navigation offers promise in such regions, but at the present time needs some backup. VLF hybrids could eliminate this need. This type of system also gives non-precision approach capability at outlying airports at no additional cost. Research at the DOT's Transportation Systems Center has also shown strong potential for DME/DME area navigation.

The Workshop recommended that

**The FAA should move to certificate VLF RNAV for IFR and DOT/TSC should con-**

### **tinue research on DME/DME RNAV and VLF hybrids.**

### **Coordination of Civil Aviation Safety**

Civil aviation faces a number of safety problems ranging from pilot qualifications and hour limitations to combustible materials in aircraft. Research and responsibility for improving these areas is fragmented among different government agencies. The Workshop was impressed by a presentation on the organization and effectiveness of the military's Joint Technical Coordinating Group on Aircraft Survivability and the recommendation by one of its members that an interagency coordinating group be established for civil aviation safety. The group would not pre-empt any other agency's area of expertise, but would coordinate activities to eliminate duplicate programs and encourage interagency cooperation and communication. The equivalent military program has been very successful.

The group would require authority, responsibility, a firm budget, a permanent staff and an assured existence of a minimum of five years so that long range planning and programs could be established. Therefore, the Workshop recommended that

**Congress should authorize \$3-5 million per year for a five-year period to initiate a joint civil coordinating group for aviation safety.**

**Approach and Landing Safety** Problems of approach and landing safety were considered particularly important in low/medium density areas for several reasons. First, the accident rate is very high during IFR circling approaches, a common approach at most low density airports. Second, NASA radar tracking studies of VFR aircraft patterns at uncontrolled airports have disclosed an entirely different environment from controlled airports. There were numerous violations of standard pattern entry procedures and several factors were noted that contributed to collision potential on the turn to final approach. Third, small aircraft are particularly vulnerable to wake vortex turbulence at larger airports. This situation may get worse since data presented at the Workshop indicated that powered lift aircraft such as blown flap STOL are expected to

generate vortices 90% as great as present wide-bodied aircraft. Therefore, traffic separation based on STOL or VTOL capabilities may still leave small aircraft vulnerable. The Workshop therefore recommended that

**The FAA should investigate the use of wake vortex size as a criterion for aircraft separation rather than weight or STOL capability or speed.**

More research is needed on the causes of approach accidents. A statistical study by the National Transportation Safety Board (NTSB) of causes to date would provide direction for this program. Basic research on deceptive visual altitude cues, particularly on descent from clouds, could be of great benefit as could educational programs on potential danger areas. The Workshop therefore recommended that

**The FAA and NASA, guided by NTSB statistical studies, should conduct additional research into the causes of approach and landing accidents.**

**Safety Problems of Commuters** No one knows what the industry safety record really is. For statistical reporting purposes, the commuters are lumped with non-scheduled air taxis and helicopter operators. The raw data exists, but has never been compiled for commuters as a category. In addition, no one has considered how to properly present commuter safety data. Because of short route segments and small passenger capacity, commuters can never hope to approach the safety record of long haul air carriers on the basis of passenger miles. Therefore, the Workshop recommended that

**The NTSB should initiate a program to improve published safety statistics on commuter airlines.**

A second problem facing the commuter industry is the difficulty of small companies instituting full-scale safety programs on their own. They cannot afford separate safety staffs or the preparation of comprehensive manuals as used by airlines and the military. And they need data support and organizational help. Therefore, the Workshop recommended that

NTSB should perform statistical research on accident causes in commuter airlines and the recommended joint civil coordinating group for aviation safety working

with the NATC should assist the commuters with safety education, organization for safety and safety programs based on the NTSB results.





## COMMENTS AND MINORITY VIEWS

After the initial draft report was distributed, numerous comments were received from Workshop participants. In most cases, the suggested changes were minor and were directly incorporated into the report. In several cases, however, the changes were significant and several recommendations were modified as a result. In other cases, the comments, although not representing the majority view, deserved special attention. This section will discuss both modifying and minority comments with quotations from participants' letters where appropriate.

### Modified Workshop Recommendations

In the draft report it was recommended that

**The FAA's Quiet Short-Haul Air Transportation Systems Office [QSATSO] support the proposed North Dakota commuter demonstration for service to small communities (or similar state or regional plan) as well as pursue its present plans of sponsoring demonstrations at congested airports.**

Without discredit to the North Dakota proposal, the wording has been changed to emphasize the Workshop's desire for federal support of local or regional planning and demonstration efforts (of which North Dakota's is an excellent example). The intent was not to endorse one specific plan but to promote federal-state cooperation.

The Quiet Short-Haul Air Transportation Systems Office (QSATSO) appeared to be a likely federal office to participate in such a program since it was in the process of developing a National Short-Haul Plan that would include demonstrations of new concepts to relieve congestion at high density airports. However, a recent FAA reorganization drastically limited the future and scope of the QSATSO program, essentially eliminating its participation in demonstration projects of any kind. The position of the FAA is stated as follows:

*The report recommends that Research and Development (R&D) funds of the FAA's Quiet Short Haul Systems Office be used for a commuter demonstration. FAA R&D funds*

*typically are to be used to develop, modify, test and evaluate systems, procedures, facilities and devices. We do not believe that the recommended demonstration project meets these criteria and that R&D funds should be used. This has the aspect of a subsidy and as such should be performed by the CAB if done at all. We believe the private marketplace should provide this entrepreneurship.*

F. A. Meister  
Acting Associate Administrator  
for Plans  
FAA  
November 12, 1973

An industry representative stated a similar position

*This is a distortion (and unwarranted expansion) of FAA responsibilities. The FAA is the enforcement branch of the aviation [industry]...and should not be involved in defining markets or services to fit those markets.*

*FAA's inputs to such a demonstration, and hopeful feedback, are in the areas of flight equipment certification, operating procedures and the air traffic control system. They are by-products. The main event is in the arenas of market demand and customer acceptance.*

C.R. Dutton  
Manager, Commercial  
Marketing, Research and  
Engineering  
Lockheed-Georgia Company  
October 31, 1973

Since QSATSO is no longer in a position to take an active role in such a project, it is no longer clear which federal agency should take the lead. Therefore, the recommendation has been made more general.

Another recommendation was deleted entirely. Several times throughout the conference, the DOT was criticized for formulating plans or programs in a vacuum and inviting comments and criticisms only after it was too late to redirect the effort to incorporate suggestions. Therefore the Workshop recommended that

**A counselling committee on aviation should be established to support the Secretary of DOT in evaluating and recommending system plans.**

The concept was to create an ongoing activity with the participation of industry, academics and other interested parties to provide a sounding board for the Office of the Secretary of Transportation, help evaluate proposals in advance of major commitments and suggest new projects where appropriate

The recommendation, however, created a dilemma. If it were strongly supported by the Workshop, then should not the concept be expanded to other modes than air? If it were not strongly supported, then shouldn't it be a suggestion rather than a recommendation? Participants were specifically requested to forward comments on which form the recommendation should take. Some parties strongly supported the recommendation and thought it should be expanded

*[I]t is my opinion that such a committee should be formed.... The aviation community is the most over regulated segment of the Nation's population. All aspects of government involvement in this regulation come as a result of "think tank" input from government employees. Some input from the consumer or user certainly is in order.*

Jack K. Daniels  
Chairman  
North Dakota Aeronautics  
Commission  
October 13, 1973

Some opposed it totally

*FAA in toto is the Secretary's advisor on aviation. Another committee would be superfluous and of no use to the Secretary. The Assistant Secretaries on the environment and safety, R&D, and policy are also advisors to the Secretary on aviation, among other matters. A duplication of this effort would really contribute to the "bureaucratic machine" mentioned earlier in the report.*

Robert L. Paullin  
Chief, R&D Policy  
Implementation Division  
U S. Department of  
Transportation  
October 4, 1973

The majority felt it should be a suggestion. In fact, a similar group has recently been informally created by industry leaders to advise the Administrator of the FAA. With this in mind, the final draft encourages and sup-

ports such activities and suggests they be continued, but no longer includes a specific recommendation.

The third recommendation drastically modified was that

**Studies are needed on "design-to-cost" engineering, new manufacturing techniques and new materials to stress low cost and reliability rather than high cost technology.**

**In particular, NASA and DOT should develop a family of new quiet engines. This should encourage manufacturers to develop new quiet aircraft for low/medium density markets and retain United States' world technology lead.**

The entire second paragraph was removed. It was originally a compromise between those who felt the government should support actual aircraft development and those who felt the government should do nothing. The latter group could see some justification for federal participation in an engine program because public benefits such as noise and pollution reduction would result (in contrast to the predominantly private benefits from a new aircraft).

Criticism came from all quarters.

*While the report does not endorse government sponsorship of a local service aircraft development, a favorable posture is expressed for government sponsorship of a commercial engine development on the premise that such engine development could contribute to the retention of the U.S. world technology lead. We cannot accept this rationale. Engine development alone — without a corollary airframe program — could decrease the U.S. technology lead in that it would provide a new engine only for foreign airframes — such as the YAK 40 — thus making them more marketable in the U.S. In this respect it is felt that the economic value and subsidy impact of a truly specialized new local service aircraft remains to be explored and that the basis for such analysis could well be NASA's currently planned design studies of innovative local service aircraft.*

C.E. Harris  
Director, Domestic Marketing  
Lockheed-Georgia Company  
October 31, 1973

The case is not made as to why NASA, from the Federal viewpoint, should be involved in the development of a family of new quiet engines for low/medium density markets. If there is such a demand, and the case is not made that there is, why can't private industry develop the engines? It is certainly questionable whether or not such a product would be beneficial to the country at large. As a matter of fact, the point is made earlier in the report that noise is not much, if any, of a constraint at low/medium density airports at the present time. This being so, there would be little if any benefit from a new quiet engine at these same airports.

Robert L. Paullin  
Cited previously.

A small commercial engine having all the general characteristics offered by the Q Fan or QCSEE engine is in existence in France, the Astafan produced by Turbomeca. The characteristics of this type of engine can be demonstrated on the modified Aerocommander that Turbomeca uses as a test bed. I have flown this aircraft and found the engine very quiet and responsive. We feel that between the work Hamilton Standard has done on the variable pitch fan component and Turbomeca's development of the Astafan sufficient development is already accomplished to make expenditure of scarce U.S. government R&D dollars on this engine development unnecessary at this time.

If noise constraints eventually require the use of this type of engine and the higher operating costs occasioned by its use are economically acceptable, then the normal market forces would probably cause such an engine to be developed. It seems to us inconsistent to recommend against subsidy to develop an aircraft that is needed to reduce or eliminate annual local airline subsidy payments, but recommend subsidy to develop a family of engines for which no clear economic requirement currently exists.

Anthony A. duPont  
President  
duPont Aerospace Company  
October 8, 1973

Two strong objections to the deletion were made

[H]istorically it has been shown that new aircraft are possible only if a suitable engine is available. Since truly pertinent, well-

executed engine designs are relatively rare, and quite costly to develop (relative to airframe development), once an engine design is brought into existence, it will and must be utilized in a great number of aircraft applications in order to make these aircraft commercially practical. Since the Workshop was addressed to a market in which there is general agreement that a variety of highly specialized, but relatively inexpensive aircraft types are required to satisfy the various operating contexts, the family, or common core, concept of engine development becomes the essence of the matter. I think that, if anything, it needs to be emphasized even more strongly. Certainly there are no existing propulsion engines which will make aircraft more responsive to the commuter operator's needs possible in the foreseeable future.

Bruce James White  
Senior Development Engineer  
AiResearch Manufacturing Co.  
October 17, 1973

It is through the fostering of improved propulsion that the federal government can best provide the stimulus needed to initiate the development of quiet and economically viable aircraft for the low/medium density market. NASA is currently funding the Quiet, Clean Short Haul, Experimental Engine (QCSEE) program for the propulsion needs of the 150 passenger,  $M = .75 - .80$  class of aircraft. Some of the fundamental technology advances from that program may well apply to the engines for the smaller and slower commuter aircraft. However, the grossly different mission profile of the latter dictates the need for a separate program to develop an optimum powerplant for that class of application.

One size of engine appears to fit the propulsion requirements for the two aircraft sizes most commonly discussed — 2-engine, 30 passenger feederliner and the 4-engine, 60-70 passenger commuter. In view of this commonality, it would be appropriate for the federal government to sponsor a program to develop a very high bypass powerplant in the 7,000 - 10,000 pound thrust class to meet the unique requirements of such aircraft.

Suitable gas turbine core engines are available in this size range thus obviating the need for costly core engine development. One of these could be selected to serve as



*the basis for a prototype development program utilizing the new very high bypass engine technology to offer a potential for shorter field lengths, lower operating costs and a most attractive noise level in the vicinity of FAR36 -20db. The introduction of such an engine to the propulsion inventory could be the single factor that would spur the expansion of low/medium density air transportation systems. In particular, the lower noise levels and steeper flight paths afforded by the new engines would eliminate the current obstacles to the development of an effective network of airports needed for this expansion.*

George Rosen  
Chief of Propulsion R&D  
Hamilton Standard Division  
United Aircraft Corp.  
November 12, 1973

However, since the vast majority of comments on the draft report were against the recommendation, the portion concerning engine development and the associated discussion have been removed.

The final recommendation receiving major modification was that

### **The NTSB should conduct additional research into causes of approach and landing accidents.**

It was pointed out by Mr. Kenneth Hodge, Director of Aeronautical Operating Systems, NASA; Mr. John Enders, Chief Aircraft/Airport Operating Problems, NASA; and Mr. Robert Paullin, Chief, R&D Policy Implementation, DOT, that NTSB would provide the statistical data needed to identify problem areas, but that actual safety research programs would be performed by NASA and the FAA. The recommendation was reworded appropriately.

### **Comments on Workshop Recommendations**

The following comments on the Workshop recommendations, while not representing majority positions, are significant and deserve special attention. They are presented with the recommendations in the same order as in the report. Recommendations that were discussed in the previous section or that received little comment are not reproduced in this section.

## NATIONAL TRANSPORTATION POLICY ISSUES

### The DOT should take an active, aggressive role in the formulation and coordination of integrated national transportation policy.

*Concur, but plans must also be established to implement such a policy. The need is for action not just platitudes.*

C. R. Dutton  
Cited previously

*Coordination is a mechanical task. We in the Department must do more than that; that is, we must assure that policy is made and then implemented, that plans and programs are formulated and carried out so that "policy" comes into being.*

Robert L. Paullin  
Cited previously

*The statement is made [in support of this recommendation] that: "there has been no clear statement of national policy that provides direction to the planner, the industry or the public." While there is no specific statement of broad national policy per se, national policy is reflected in existing laws, orders, regulations, etc and their application. This is a framework within which planners work now and should be explicitly recognized in the report.*

F. A. Meister  
Cited previously

### In taking the lead in transportation planning and coordination, the DOT should consider modal economic efficiency (including all private and public costs and benefits), modal energy requirements and consumer desires in formulating policy.

*Considerations of environment and land use should also be added. Land use may be aviation's largest single advantage to the nation as a whole.*

C. R. Dutton  
Cited Previously

*[C]apital cost and maintenance cost of airports have not been properly reflected in the total air transportation cost. These costs are rising and there is some movement toward the user paying his full share. (5,000 for a 747 turn-around at Heathrow*

*has been reported ) True cost, collected by user charges, for low density short haul air could have a big impact on these operations. Energy requirements should likewise consider energy expended for operation, snow removal, construction and maintenance.*

Jack T. Stultz  
Manager, Airline Marketing  
Sikorsky Aircraft Division  
United Aircraft Corp  
October 19, 1973

*The transportation planner in each mode will have difficulty considering total energy efficiency because he is not in a position to make modal tradeoffs. Trust funds also work against this consideration. This problem should be identified in the report.*

F. A. Meister  
Cited previously

*I still have major problems in declaring energy efficiency per se as being any sort of national goal. [This opens] up the potential for a great deal of waste of resources if you go this route.*

George Eads  
Associate Professor of  
Economics  
The George Washington  
University  
September 28, 1973

*Too much mischief can come from undue preoccupation with "energy crisis."*

James C. Miller III  
Associate Professor of  
Economics  
Texas A&M University  
October 1, 1973

1. **Federal subsidies to transportation should be paid only when**
  - A. **There is a clear national policy that the subsidy payments encourage or support; or**
  - B. **The subsidies are for limited experiments to demonstrate the potential of new concepts to the private market, which would take over implementation if the demonstration were successful.**
2. **This policy toward transportation subsidies should apply to all modes.**

*The reasoning used to justify the conclusion on policy and subsidy fails to recog-*

nize that the air transport industry does not operate as an open, free enterprise system, and the Federal Government is not likely to become less involved in its operation.

C. E. Harris  
Cited previously

[T]he one area where we are apart is in your comments on federal support for a distinctly local benefit. It reads as if you see the nation as being divided between local people and national people. We know, of course, there are no national people, but only local people who together make up the nation. With the exception of such activities as the administration of the federal government and the business of foreign policy and national defense, practically everything else the federal government does has to be done in one or more localities. It is fair to say that local service airlines pretty much blanket the country so that air transportation to all local areas by them is truly national in scope.

William W. Hogan  
Treasurer  
Frontier Airlines  
September 26, 1973

Good idea to demand a clear national policy. Is not this policy outlined in many Senate resolutions of past years regarding local carrier subsidy?

William M. Magruder  
Executive Vice President  
Piedmont Airlines  
October 8, 1973

I agree that the general consensus was that the DOT should play an aggressive role in the formulation and coordination of an integrated National Transportation Policy. What the report fails to mention, however, are the directives already laid down by the Congress, particularly in the Federal Aviation Act of 1958. In fact, one could conclude that the Workshop intentionally or inadvertently ignored the Federal Aviation Act of 1958.... I do not believe...that the recommendation as written is the consensus of the Workshop.

I recommend the following substitution:

1. Federal subsidies to Air Transportation be paid only when
  - A. Such subsidies are required to provide a level of air transportation service determined to be in support of the National Transportation Policy.

B. (No change)

2. This policy toward air transportation subsidies should apply to all air carriers.
  - A. The selection of air carriers to receive such subsidies should be predicated on a combination of desire and ability to serve, economic efficiency and energy considerations.
  - B. The amount of subsidy should be such to assure full compensation including a reasonable return on investment for the service performed.

Gordon Linkon  
Vice President-Marketing  
Frontier Airlines  
October 18, 1973

[The discussion leading to this recommendation] seems to overlook the fact that Congress has found that subsidy of some local benefits is in the national interest. If this is the wisdom of our collective representatives, how can it be "found without merit"? . . . I think that any realistic appraisal of what Congress has done provides ample evidence that low cost transportation for every American is an implicit, if not explicit, national goal or policy. I find the evidence of things done much more persuasive than the evidence of things said. Hence it seems open to question that things would be much improved if Congress said explicitly the purpose for which it did things implicitly.

Robert E. Monroe  
Vice President - Policy and  
Technical Planning  
Aircraft Owners and Pilots  
Association  
November 12, 1973

The difficulty of the draft report in discussing subsidy is its belief that all subsidies should be paid by the users — it considers a national transportation system to be a service for the users and not a national asset for the benefit of all the people. The aviation industry produces substantial public benefits to all of the nation. Subsidy to enhance these benefits can be justified were appropriate national benefits are derived.

LASAC [Local Airline Service Action Committee] maintains that a National Air Transportation Policy has real basis in the historical record of Congressional action. If present policy declarations are insufficient, a more detailed statement of national policy may be required. To this end, LASAC con-

tinues its support for the following goals.

(1) The expansion and development of local air service to ensure the broadest possible coverage at the lowest practicable rates to serve the needs of the small- and medium-sized cities and the nation with air services.

(2) The establishment of procedures and programs for cooperative efforts by the federal, state and local governments in the formulation of standards and policies to govern the inauguration, maintenance and development of local air service in the various areas of the country

(3) A review by the Congress of the administration by the Civil Aeronautics Board of the policy of the Federal Aviation Act with respect to local air services and the adoption of a resolution or statute expressing the sense of Congress in regard to local air service.

(4) The maintenance of at least the current level of local air service with regard to cities served and schedules operated pending the review by Congress

James L. Vance  
President, Local Airline  
Service Action Committee  
Publisher, Worthington Minn.  
Daily Globe  
October 29, 1973

**DOT, as part of its planning process, should attempt to strike a better balance between rural and urban transportation services.**

*The report recommends a better balance between rural and urban transportation. This is an admirable goal, but how are expenditures to be allocated to achieve it? For example, does the interstate highway system serve the needs of the residents of large cities or has it opened up rural areas thus providing better access to cities as well as other rural areas? An elaboration of this thought might be good to include in the report*

F. A. Meister  
Cited previously

**The DOT, with other government agencies, should determine if in fact population dispersal is a valid national goal and how transportation aids or detracts from that goal.**

*I believe for instance, that the goal of redistribution of population is a worthy one and that lacking any change in policy since the President's 1970 State Of The Union Message it remains an official policy. I agree with the report in its conclusion that improvements in the air transportation system will not assist in moving population from urban to rural environments, but I feel such improvements might reduce the present flow of population from rural to urban environments. When one considers the huge investments being made in cities to cope with their increasing populations, the investment in subsidy seems small and, if effective in slowing the population growth in cities, worthwhile.*

John R. Auer  
Deputy Director for Operations  
Department of Aeronautics  
State of Nebraska  
October 9, 1973

*The discussion about whether people want to live in urban or rural areas involves too much speculation about what people do or do not want to do. If National Transportation Policy is to be established and meaningful for the next 25 years, then we should be looking ahead to what should be, not necessarily what we have now.*

Howard C. Tinney  
Manager, DHC-7 Program  
Boeing Commercial Airplane Co.  
October 23, 1973

*The statement that people do not want to locate in smaller towns surprises LASAC [Local Airline Service Action Committee]. Job opportunities not considered, substantial evidence on preference of city dwellers for living locations, countryside vs. metro center, has been accumulated. The results of these studies point to opposite conclusions. Where people live, finally, is often a determinant of economic opportunity, which in turn is at least a partial byproduct of transportation adequacy. Good air service can be a vital factor in promoting a healthy dispersal of industrial facilities to all parts of the nation. To this end, the Congress is the appropriate national agency to establish a determination whether population dispersal should be a valid national goal and how transportation aids should promote or detract from that goal. Public policy determinations of this import should involve a broad*





base of public input at the highest level of decision making.

James L. Vance  
Cited previously.

*I question the validity of the material respecting population dispersion. The implicit purpose of the host of laws, programs and appropriations to improve the quality of rural life is to make it unnecessary for people to migrate to the cities to obtain a better quality of life and to make it possible for those in the cities who are so inclined to return to relatively rural locations. Note for example the Appalachia program and its counterpart commissions, the Rural Development Act of 1972, and a number of other rural assistance programs you will find referenced in the Congressional Quarterly. I have seen several remarks on this subject in the Congressional Record and one which arose from a speech at one of our meetings.*

Robert E. Monroe  
Cited previously.

## **NATIONAL AIR TRANSPORTATION POLICY ISSUES**

**The evidence seems strong, even with faulty statistics, that some upward adjustment of general aviation payments is in order. But this should be gradual in order to avoid unnecessary disruption of**

**activities that rely on the present system.**

*I disagree that the evidence referred to is as strong as the Workshop implies and invite your attention to the [recent] paper by Battelle [challenging the Cost Allocation Study].*

Robert E. Monroe  
Cited previously.

*An unwarranted assumption based on a faulty foregone conclusion. If the Workshop did not contribute in any way to clearing up this issue then no recommendation should be implied.*

C. R. Dutton  
Cited previously.

*The reference to the "air carrier" industry paying their share of the system costs [while "General Aviation" is not] must be stopped. The "air carriers" are not paying much more than "General Aviation." All they are paying is the registration and weight tax. The people or group of system "Users" that are really paying their share are the airline passengers and they should be getting the credit.*

Jack K. Daniels  
Cited previously.

*One group of people felt that the cost allocation study should have looked at costs from another viewpoint, i.e., 1) determine*



cost of system required to meet military needs, 2) determine costs for additional facilities and services (above those required for the military) required to support air carriers, and 3) determine if those facilities and services satisfy the requirements of general aviation; if not, add facilities and services until the requirements are satisfied. The costs should then be allocated according to the facility and service requirements.

Howard C. Tinney  
Cited previously.

**The CAB should announce a policy of allowing gradual expansion and evolution of locals to trunk status as present excess capacity is absorbed with the concomitant elimination of local service subsidies and deletion of subsidized points.**

*I see nothing to be gained in the way of efficiency or anything else by the merger of locals into trunks. I know of absolutely no evidence that this is desirable or necessary*

George Eads  
Cited previously.

*This is a drastic measure which would put us in the posture of 30 years ago when local service carriers were created to serve small/medium communities. The corollary of merging local service carriers into the trunks is the emergence of commuter carriers to serve the smaller cities. If this could*

*be done without subsidy, it would of course be the result which the draft report is seeking. LASAC [Local Airline Service Action Committee] feels the draft report tends to regard commuter capabilities in this regard with undue optimism. LASAC is of the opinion the end result would be subsidy for the commuter carriers who would then become local service carriers, and MIT would be recommending their merger with the trunks in the year 2002, or thereabouts.*

James L. Vance  
Cited previously.

*[T]his trend introduces a deficiency in the gross air transport system. The second levels are not, and were never intended to be, "local service" carriers, as they have so erroneously been called over the years. Rather, their route structures are intended to be regionally oriented, and as nonredundant regionally as possible. The essential capability that this implies which is not inherent to the local service, or commuter, context is ability to provide service from some relatively low density point to quite distant points of much higher population density within their own system....*

*One must not overlook the purpose of the charter under which the U.S. second levels were originally certificated, and appreciate the fact that the commuters cannot ever be in a position to fill this role, and still be res-*

*ponsive to the true commuter market*  
Bruce James White  
Cited previously

The recommendation is based on the assumption that commuter carriers can provide needed service to small communities as local service carriers delete them. This drew the following comment.

*[T]here are no commuters that fit your description.. that service the Piedmont area. This is not to say that they could not appear at some date, but the population density is not the same as in the Allegheny area and they do not exist now.*

William M Magruder  
Cited previously.

The report states that Air Line Pilots Association (ALPA) resistance must be overcome for the transition of locals to trunk status to take place and that nationally ALPA is against local carriers deleting points or entering into commuter substitution agreements. The report points to the "Scope" clause that requires union approval of such deletions or substitutions and ALPA's recent court challenge of the CAB's power to exempt commuters from detailed regulation as evidence of this policy.

*[The] Draft Report misstates ALPA's position ALPA has no national or general policy opposing the "deletion" of certificated points Nor is ALPA's opposition to the commuter substitution program based upon "highly technical arguments," although, I suppose, this may be a matter for subjective judgment. In my opinion, ALPA's legal position is quite simple and non-technical: i.e., Congress did not give CAB power to appoint unregulated carriers to perform the work of the certificated transportation system.*

Gary Green  
Director, Legal Department  
ALPA  
September 25, 1973

*It appeared to be the sense of those present that the Scope Clause and ALPA's legal action against the CAB were not the anti-commuter actions they have been made out to be*

Lou Davis  
Director, Public Relations  
ALPA  
October 23, 1973

**The DOT, FAA and CAB should officially recognize and endorse commuters as a vital segment of air transportation not essentially different qualitatively from certificated air carriers. The federal agencies should impress these attitudes upon state, local and airport authorities as well as influence the certificated carriers to adopt more cooperative arrangements with commuters.**

**There should be a total and complete disassociation of commuters from general aviation and air taxis, including separate regulations where appropriate.**

*[T]he report should have gone on to recommend that in achieving this disassociation, the Board should acknowledge this divorce with a separate and distinct set of Regulations entitled "Classification and Exemptions of Commuter Air Carriers"...*

Karl P. Baldwin  
Chairman of the Board  
Air Wisconsin  
September 24, 1973

**The commuter industry should retain its unregulated free competition status.**

**If regulation is forced upon the industry by the courts, Congress should enact specific legislation to exempt commuters from regulation or amend the Federal Aviation Act of 1958 to allow the CAB to insert conditions in commuter certificates that essentially retain the present Part 298 in another form.**

*I believe this section misses a very significant point raised at the Workshop. It appears the drafter of this section erroneously assumed that the issue of certification had to be resolved on an "all or nothing" basis. This is not the consensus of the Workshop. The participants who favored certification and those opposed to certification were in agreement that if certification were made available but did not become mandatory, the industry, the small communities and the regulatory agencies would have the best of all possible worlds.*

*We would have a flexible system which would support free competition in high density markets, provide protection in thin markets and provide the opportunity for a direct subsidy experiment where subsidy may be required.*

*In fact, a commuter carrier should be permitted to serve one market in a free competitive environment (no certificate requirement or limitation), another based on an arrangement with a local carrier and still a third under a certificate from the CAB with all of the burdens and benefits attendant to such certificate (including the potential for subsidy).*

Gordon Linkon  
Cited previously

The report stresses that the CAB must have the power to restrict the types of aircraft commuters can use to prevent their following the transition of the local service carriers into aircraft too large for small community service.

*The big airplane is not the culprit it is made out to be. The locals went to the more comfortable (pressurized, jet) equipment to protect their markets. The competition was the family automobile and it was (and is) formidable. There were no small airplanes that were also comfortable airplanes. Commuter success now is in part a reflection of increased surface (auto) traffic congestion and the frustrations attendant thereto. If the commuters experience any growth at all they too are going to want to go to larger equipment — for both competitive and economic reasons.*

*There is no proof that subsidy payments have in fact increased — on a real or constant dollar basis — as a result of re-equip programs. The correlation is more akin to general economic conditions. It was an unfortunate "happenstance" that the jets were ordered at about the time of the 1957-1958 recession and that significant progress payments had to be made during the 1960-1961 recession. Subsidy hit a peak in 1963, the year the first jets were introduced by the locals, but was significantly reduced each year thereafter, as the economy — and jet fleets — expanded. Industry payments in 1970 were the lowest since 1963 on a current dollar basis, and the lowest since 1955 on a constant dollar basis. Once again the increases in subsidy in 1971 and 1973 are in exact juxtaposition with a down-turn in the economy.*

*There were of course other forces at work during these periods as well, but the above evidence is sufficient to dispel the direct tie*

*between "too large aircraft" and federal operational subsidies....*

C R Dutton  
Cited previously

*[A]ll levels of scheduled air transport services must eventually be regulated by a federal agency, and that agency must be the CAB. State agencies should have nothing to do with the matter. In general, they have neither the understanding or visibility of the overall situation, nor can they be sufficiently divorced from political pressures to function adequately in a position of any authority.*

*I cite the fragmented inconsistent nature of the local service air transport industry in the United Kingdom during the past twenty years as a prime example of what happens to a segment of a total public service requirement which is outside the interests and protection of a federal or national regulatory power which in fact has other interests within the total system. What is necessary is for the CAB to come to a better understanding of the essential differences in the four basic levels of the service structure, and how they must relate to each other.*

Bruce James White  
Cited previously

*I differ with the conclusion that limited certification is not required in the commuter market. Your logic in developing this conclusion is impeccable, but we have repeatedly seen entries into aviation markets that were not based on logic. It seems that there will always be people willing to invest in aviation in the face of very dismal prospects just because they love the flying business. Our experience with commuter service in Nebraska is limited but we have several instances of two or three marginal operators competing with each other in markets which are only adequate for one.*

John R. Auer  
Cited previously

## **LOW/MEDIUM DENSITY AIR TRANSPORTATION POLICY ISSUES**

**Direct federal subsidy of air service to small communities should be eliminated and the responsibility for subsidizing air transportation, where necessary, should be delegated to the lowest governmental level capable of assessing the costs and benefits of the service.**

The draft report appears to consider subsidy to be an objectionable concept and would eliminate it. Philosophically and practically, LASAC [Local Airline Service Action Committee] must take exception to this broad exclusion. Subsidies in a wide variety of forms traditionally have played an important role in development and maintenance of the nation's transportation systems. Considering the needs and costs for providing scheduled air service to the low/medium population centers throughout most of the nation, it is inconceivable to LASAC that any kind of adequate system can be maintained without a degree of subsidy, either public subsidy or that provided internally by the carriers from proceeds of more profitable, long-haul routes. LASAC does not argue that certain routes by both certificated and non-certificated carriers cannot operate profitably without subsidy. LASAC does argue there is a continuing national need to provide dependable, scheduled air service to smaller and medium-sized cities in all parts of the country; to provide this service, subsidy where appropriate, will continued to be required.

The statement that funds received through revenue sharing can be expended by the smaller community to support air service is not supported anywhere in the report. Even if there were no other priorities for these funds, the amounts of revenue sharing dollars received by these municipalities are generally wholly unequal to the cost of air service subsidy.

James L Vance  
Cited previously.

There is apparent inconsistency with respect to the conclusions related to National Transportation Policy Issues, i.e., how can the Workshop on the one hand recommend federal subsidy payments in support of a clear National Policy and recommend to eliminate federal subsidy, on the other hand.

There is also an inconsistency with respect to the recommendation for no regulations or interference from state or local agencies on the one hand and the recommendation that subsidies be paid from state or local agencies. Clearly, no one can prudently recommend localized subsidy without localized regulations to assure that the purposes requiring subsidy are being made on an honest, economical and efficient basis....

[In addition, the Workshop failed] to address itself to the very large problem of how do we get from here to there... If federal subsidy is terminated, the certificated carrier involved must surely be given the option to terminate its service or to continue without any subsidy or receive a localized subsidy. If the choice is, in fact, a "free choice," the small isolated community is bound to lose. If it is not a "free choice" and a requirement to serve can be imposed on a local carrier at the state level, what happens to the plan to permit local carriers to transition to smaller trunks?..

In essence, I believe the recommendation to eliminate all federal subsidy is both contrary to the consensus of the Workshop and good judgment. That is not to say, however, that a recommendation is not in order to reduce the amount of federal subsidy through deletions, flow through, direct subsidy to commuters, etc., coupled with a recommendation to encourage localized subsidy for commuter service to communities that do not otherwise meet federal standards.

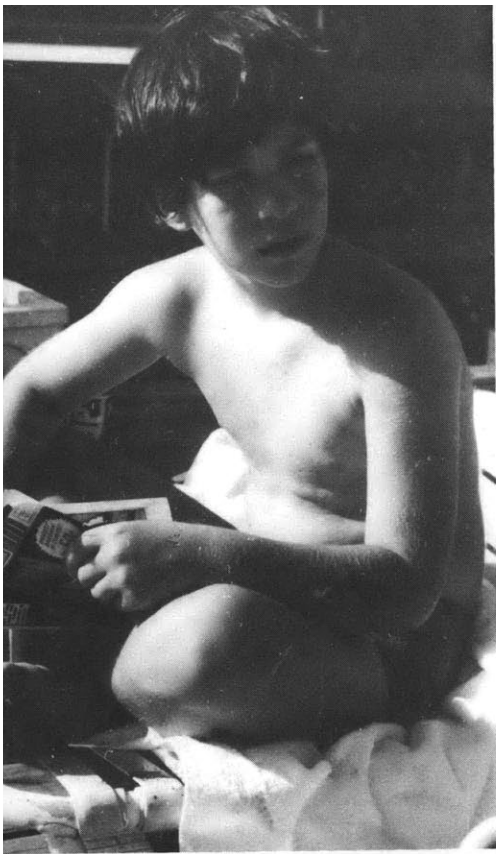
Gordon Linkon  
Cited previously.

In its discussion of this recommendation, the report raises several possible reasons for federal subsidy, but rejects them as being primarily local matters.

Regarding community pride, I think that community pride leads to pride in the state and nation that provides the climate for a community to do prideful things. I doubt that you really mean to suggest that there is no national interest or benefit from being composed of communities that take pride in their community progress. After all, these communities are the sources of all that tax money that the nation redistributes.

Regarding...Economic...Development... [t]he studies I have seen have indicated the airport as one of the indispensable ingredients among others for economic growth....

[The report] again deals with the concept of benefits for the nation as a whole. I can't help repeating that the nation is made up of individuals and I know of no way that the nation can be benefitted as a whole without benefitting individuals. Sooner or later, every federal program impacts on some one or more individuals. I conclude that an impossible and fallacious criterion has been applied.



Regarding Transportation as a Public Function, is it really "local" transportation that we are talking about? Section 8 of Article I of the Constitution would seem to establish some obligations "for post roads" and their modern day equivalents; and a large number of Congressional enactments for the purpose seems to belie the assertion that there is no [federal] legal obligation in local matters of this kind....

Robert E. Monroe  
Cited previously.

## TECHNOLOGY ISSUES

**Although foreign trade and international leadership concerns might justify government subsidy of the design and development of a family of new small jet aircraft, such a program cannot be justified on domestic considerations alone.**

*[You] are totally off base with any recommendation suggesting that government subsidy for development of small jet aircraft might be justified on grounds of "foreign trade and international leadership."*

George Eads  
Cited previously.

*[A] national point has been missed here. Also, a national opportunity. We have limited resources, but we do have multiple missions — Navy COD, USAF CXX, State Department Embassy Aircraft, et al. The replacement for the locals' YS-11, F-27 and Convairs is only five years away. Why avoid the subject of putting the requirements together? These airplanes have always been severely compromised. I believe this to be a great area for technology planning. The COD requirements are not rigid. For example, the speed was selected only to assure no propellers — a maintenance concern. I would suggest that somehow a collection of their requirements be examined to determine what can be done. Remember, airplanes like the DC-8 have ranges that vary from 2500 to 6000 n. mi., different wing areas, spans, leading and trailing edges, several engines, several fuselage lengths, cargo and convertible configurations. Few, if any, of these model variations were planned in advance. The current DOD, OMB and Congress mood is to save money in defense areas when it makes sense and I believe this is a sensible area. One configuration of the basic model does not have to do*



*all jobs, but a good basic design with several model changes would probably do a great many things much cheaper than three or four optimized airplanes.*

*My coordination with the Navy COD people did not show any great desire for a high performance aircraft. Their original speed requirement was for 250 knots, but they raised it to 330 knots to try and eliminate propellers due to maintenance problems in their present fleet. I believe the military-civil compromise can be easily obtained.*

*The domestic justification that overrides all others these days is to spend money efficiently. The COD, CXX, State Department — helping in subsidy is a high order of national priority — if it is presented this way. It is just hard to do these things across departments, services and with civil operators. I also do not necessarily agree that such an aircraft would not reduce subsidy. The more profit on medium-density routes, the less subsidy on low-density routes.*

William M. Magruder  
Cited previously.

*A single high performance short field aircraft can satisfy a number of civilian and military needs such as COD, utility transport and attache aircraft. The proper aircraft can have a large enough production base to have reasonable purchase costs. The government can and should support the development of such an aircraft by procuring it for COD and other military requirements and paying the development costs of the military versions. The development cost of the aircraft in addition to being justified by the military requirements will be returned to the taxpayers many times over by the reduction of the procurement cost to the military because the production base is increased by civil airline requirements, by improved local airline service, and by the eventual reduction or even elimination of subsidy to the local service airlines.*

Anthony A. duPont  
Cited previously.

**Studies are needed on “design-to-cost” engineering, new manufacturing techniques and new materials to stress low cost and reliability rather than high cost technology.**

*These types of studies involve a form of*

*technology. Therefore it is not correct to say that no new technology is needed.*

Susan D Norman  
Aerospace Engineer  
NASA Ames Research Center  
October 28, 1973

*One half the operating cost is labor. One thing that is hurting the commuters and local service carriers is the increase in cost per seat for non-jet aircraft. The consensus was that R&D needs to be directed toward an airplane which is simpler to operate and requires fewer manhours for maintenance. Reliability and simplicity being the key areas for development. Breakeven costs for the airplane should be at load factors of less than 40%.*

Howard C. Tinney  
Cited previously.

**The FAA should balance safety with cost effectiveness in low density areas.**

*This is a poor way in which to achieve safety. Cost effectiveness by definition means the quantification of dollars versus some parameter of effectiveness. Historically, the FAA has not accepted the rate of say five fatal accidents per year as balancing off the cost, for example, of a particular flight control system or an air traffic control system.*

Robert L. Paullin  
Cited previously.

*[The Local Airline Service Action Committee (LASAC)] is somewhat appalled at the statement that the “FAA should balance safety with cost effectiveness in low density areas.” The aviation background of numerous LASAC representatives indoctrinated them with the principle that “safety is no compromise.” LASAC must deplore any attempt to improve the economics of an air carrier operation at the expense of safety.*

James L Vance  
Cited previously.

**ATC centers should initiate letters of agreement and local procedures at low density terminals and the FAA should publish local procedures in the Airman’s Information Manual.**

*These recommendations arise from the problems faced by commuter carriers at*



small, uncontrolled airports

*[On the one hand] you refer to controlled air space and changes to VFR minimum visibility requirements, while on the other hand you refer to low density markets. Care must be exercised in the imposition of restrictions on the general aviation operator that provide for a commuter to fly IFR in controlled air space once or twice a day serving five to six passengers.*

*Once the control zone is established it exists 24 hours per day and further reduces the freedoms of the non-air carrier aircraft operator permanently*

Jack K Daniels  
Cited previously

*"Control zone" type protection around airports served by Commuters is a must. The passenger deserves the same consideration in Podunk that he does in megalopolis — this is a double standard of safety.*

C R. Dutton  
Cited previously

### **The FAA should move to certificate VLF RNAV for IFR and DOT/TSC should continue research on DME/DME RNAV and VLF hybrids.**

*There is a great deal of uncertainty associated with VLF requirements, costs and payoffs. Until this uncertainty is resolved, by controlled analysis, we do not believe FAA should certificate VLF.*

F A. Meister  
Cited previously

### **Congress should authorize \$3-5 million per year for a five-year period to initiate a joint civil coordinating group for aviation safety.**

*The existing Federal, state, and private industry groups concerned with aviation safety should continue to carry out their responsibilities with increased coordination, if desired. There is one major difference between civil aviation and military aviation and that is the proprietary nature of civil aviation. I did not hear the presentation by the military representatives, but I understand from the report that they are coordinating technical information. I have worked in aviation on both sides of the fence, i.e., military and civil, and based on this background feel that the coordinating group suggested would not*

*be effective, even though authorized a considerable amount of money for a five year period.*

Robert L Paullin  
Cited previously

*For air carriers, all operations, for the period 1950 through 1970, 21 years, the total fatality rate averaged at 5.99 fatalities per 100,000 flying hours.... Air carriers are considered to be one of the safer forms of transportation. The same figure for general aviation is 6.57, about 1/2 a fatality more. This suggests to me that safety is not the major problem it is presented to be. Injuries in aviation are a fraction of fatalities while in surface transportation the reverse is the case. Since no federal records are kept or published on property damage due to aviation, the implication is that it is a minor matter. This leads me to question the validity or benefit of the recommendation for a \$3-5 million dollar program for a coordinating group for aviation safety*

Robert E Monroe  
Cited previously

## **Comments on the Text**

Some minor points discussed in the report also drew comments, even though no recommendations were made. In the draft, the statement was made that " U S designed helicopters were not efficient under high altitude conditions and research in this area was warranted." This statement was based on a misunderstanding and has been removed as a result of the following comment:

*Reasonable data is available to trade off rotor characteristics, i.e., tip speed, solidity, and installed power to achieve good altitude performance. The selection of an 8 or 10 thousand ft. design point will result in an increase in the ton mile cost when the aircraft is operated near sea level.*

*With the present size of the commercial market, it seems best for both the manufacturer and operator if a design point of about 2000 ft. for a hot day is chosen. The operator must then choose a larger helicopter and operate at reduced payload when his operations are at high altitude.*

*The research might best be conducted on market demand and cost sensitivity, to*



*quantify requirements for special purpose helicopters.*

Jack T. Stultz  
Cited previously.

The other area that received comment related to carrier finance.

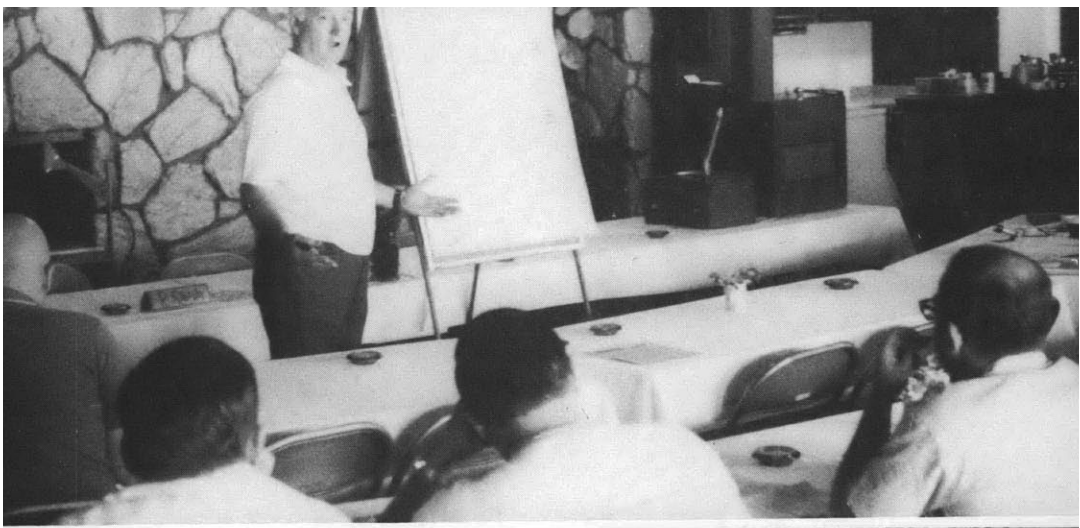
*[D]uring the session I sensed some lack of reality as to the money market, principally the equity portion of it. While this is more appropriately the field of an investment banker, not a commercial banker, I felt that there was a substantial lack of understanding on the part of some as to what attracts the potential investor to acquire an interest in a company or in an industry. That feeling on my part originated from the quotations made by some of the earnings rate on a typical airline investment made at a remote period in the past.*

*Obviously, anyone putting his money to work today could not care less what an investment, made twenty years ago, might be worth today. Instead, the potential investor*

*is going to be appraising what is going to happen to that new investment in the future. True, some of the foundation for that appraisal will come from what has happened in the past, but the past period included in that appraisal will probably not exceed five years. He will be using that past experience only as a guide as to the future. Naturally, he will also be looking at the other elements that relate to the potential future profitability of the enterprise under study including the regulatory climate when applicable.*

*[W]ith the possible exception of periods of abnormal credit restraint, such as we are now in, well structured, well managed companies with firm prospects for a profitable future should have no problem in securing financing, i.e., they should be able to get equity first and bank or other debt financing thereafter.*

Ronald G. Ross  
Group Vice-President  
Bank of America  
August 24, 1973



[Mr. Ross' comments were based on an actual session of the Workshop and not on the draft report. Ed.]

*First, the locals in fact have obtained... capital over the past few years (look at their rates of growth in equity-plus-debt), although, as you note, the unrealistically low ceiling on subsidy-eligible ROI does skew the allocation of new investment. Second, estimates of the cost of capital reflect the debt/equity ratio. If a firm has a high debt/equity ratio (and debt costs less than equity), then its ROI after taxes but before interest payment on debt is going to reflect*

*to a greater degree the lower cost of debt. Third, in the DPFI the Board based the local service "target" ROI not on the actual debt/equity ratio of 88/12, but on an "optimum" ratio of 60/40. Thus, the 12.35 percent ROI concluded to be reasonable is in excess of the actual cost of capital (found by the Hearing Examiner to be 11.0 percent). In any event, including the capitalized value of leased aircraft in the rate base or resorting to an operating ratio approach to ROI would appear very unsatisfactory.*

James C. Miller III  
Cited previously.

## EPILOG

In retrospect, perhaps the most difficult question to answer is "what did the Workshop accomplish?" Its major accomplishment may have been the least tangible: bringing together people with different, often conflicting opinions and positions in a manner that allowed a fuller, freer interchange than is normally possible. Most participants said they left the Workshop with a better understanding of the issues and a better perspective on the overall problem of providing air service to small communities. Judging from previous Workshops, the effects of this information exchange may not be felt for two or three years. And when they are felt, people probably will not connect them to their origin at Aspen in 1973.

There have, however, been some direct effects. For example, NASA revised its study of a new aircraft for small city service because of the Workshop's recommendations. The request for proposal recently issued referred to the Workshop several times. Also, the National Air Transportation Conferences (the commuter trade association) published a booklet called "Clearing the Air" explaining the industry's position on several key issues raised at Aspen and the NATC membership revised its position on limited certification, no longer favoring it, after a floor debate that was punctuated with references to the Aspen results. The Workshop was specifically mentioned as providing the impetus to clarify and restate NATC's viewpoints. In addition, Robert H. Binder, the DOT Assistant Secretary for Policy, Plans and International Affairs (Designate), referred favorably to the draft report in a speech at the annual meeting of the Association of Local Transport Airlines. And several federal and state officials who attended the Workshop have made statements of policy that reflect the Workshop's sentiments, although no specific reference was made. Thus, in numerous ways, the impact of the Workshop is already being felt in both industry and government.

In contrast to these Workshop-inspired actions, at least one hoped-for result has not occurred. There has not yet been any indication that the federal Department of Transportation will become more involved in the problems of the nation's smaller communities, much less show the leadership that the Workshop requested. The reasons for this are complicated and difficult to determine, but the following at least contribute

to the DOT's apparent reluctance to take a more active position.

The Department is only one of many agencies that directly or indirectly affect transportation policy. Since it has no control over the other parties, the DOT must rely on persuasion, personal contact and informal methods to develop a consistent government position. This is an enormous and time-consuming task. Although there are members of the Department who are working toward greater DOT leadership in this way, it will be a long time before their efforts are felt. There are also people within DOT who prefer the status quo. Realizing the Department's limitations, this group addresses problems from that perspective, thereby automatically limiting the scope of any solutions. Neither approach produces quick broad solutions to national problems. Thus the DOT is effectively prevented from providing leadership by the very institutional problems it was created to solve. At present, no one agency can resolve the conflicts without Congressional action and it is doubtful that Congress will grant the needed powers to an agency in the executive branch.

Very early in the Workshop itself, it became apparent that there were at least two different overall philosophical positions held by participants. The first, held primarily by federal officials and academics, placed great reliance on free market forces to accomplish policy goals and on the belief that government intervention should take place only when strong public policy reasons required it. And then such intervention should be minimal and create the least possible market distortion. The second position, held most often by state and local representatives, was based foremost on public policy considerations: a need for air service was perceived, the fact that the free market was not serving that need indicated that the free market was unable to satisfy the need and that government action was required.

This divergence in underlying assumptions makes communication between state and federal officials difficult. According to state officials, they receive no satisfaction from Washington and are shuffled from one office to another when they attempt to explain their problems to federal agencies. According to federal officials, state and local people present plans based more on emotion than logic and want huge federal subsidies to support ill-conceived programs.

From many discussions with people in both positions, it seems that federal officials living in the high density eastern corridor often do not understand the problems of the resident of a small isolated community, particularly in the midwest and far west. But it is also clear that people from those areas do not understand the problems of the Washington political structure. They approach each federal office as if it and it alone had the power to satisfy their state's needs, while in reality they must gain support from a number of offices, agencies and Congress itself before an effective federal-state program can be developed. (Perhaps the Workshop itself has made the same mistake by singling out DOT for leadership.)

From observing these conflicting viewpoints in the reactions of federal officials to the Workshop's draft report, it appears that the states must rely on their own resources if they want quick solutions to the transportation problems of small communities. Fed-

eral support, with the possible exception of limited planning funds, will not be forthcoming in the near future. The avenue to long-term federal support is not through the DOT, or perhaps even through the CAB, but through Congress. If the states can convince their elected representatives in Washington that their plans are sound, then Congress may pass legislation directing both federal participation and commitment of funds. Until such a directive is issued, however, there will be no federal leadership.

In summary, the Workshop did have some measurable impact on the people attempting to find solutions to the problem of small community transportation services, although it did not achieve all that might have been desired. It was an effective communications tool and served to clarify and present the key issues to be resolved. Only time will tell whether actual solutions are forthcoming.



## APPENDIX A

### Keynote Speeches

**The National Interest in Air Transportation to Smaller Communities**, Robert H. Binder, Assistant Secretary for Policy, Plans and International Affairs (Designate), DOT

**Problems and Issues Facing the Local Service Industry**, Raymond J. Rasenberger, Washington Counsel, North Central Airlines and Chairman, ALTA 3rd Level Committee

**Problems and Issues Facing the Commuter Industry**, Thomas Miles, President, National Air Transportation Conferences

**The Community's Interest in Air Service**, James Vance, President, Local Airline Service Action Committee and Publisher, Worthington, Minnesota, Daily Globe

**The Role of Technology in Transportation**, Lawrence P. Greene, Assistant for Aeronautical Research and Development, DOT

**FAA Plans and Programs for Low/Medium Density**, Frederick A. Meister, Acting Associate Administrator for Plans, FAA

## APPENDIX B

### Panels

**The Role of Air in the National Transportation System**

Moderator: A. Andrews, Consultant to M.I.T.

Subtopics included the public benefits of air service, the use of air for population dispersion, the proper role of general aviation, DOT Cost Allocation Study, short haul planning.

L. Davis                      Director, Public Relations, ALPA

P. Fahlstrom                Program Director, Aviation Cost Allocation Study, DOT

T. Miles                      President, NATC

R. Monroe                    Vice President, Policy and Tech. Planning, AOPA

D. Sheftel                    Director, QSATSO, FAA

**The Community's Need for Air Service**

Moderator: R. Ausrotas, M.I.T.

Subtopics included the quality of air service to the community, Houston STOL program, problems of isolation, population growth, community growth, industry and area de-

velopment, problems of low density commuters

K. Cardella                President, Cochise Airlines

J. Foster                      Director, City of Houston Aviation Dept

E. Gerhardt                Director, Special Projects, Local Service Marketing, Frontier Airlines

G. Hunter                    Chief, Planning Staff, Rocky Mtn. Region, FAA

D. Mays                      Director, Washington

H. Swaine                    State Aero. Commission Chairman, Dept. of Economics, N. Michigan Univ.

### The Costs of the Air System

Moderator: H. Swaine, Consultant to M.I.T. Issues included the costs of the air system, allocation of those costs, energy consumption, direct subsidy and its effects.

G. Eads                      Assoc. Prof., Dept. of Economics, Geo. Wash Univ.

P. Fahlstrom                Program Director, Aviation Cost Allocation Study, DOT

R. Monroe                    Vice President, Policy and Tech. Planning, AOPA

J. Vittek                      Workshop Director, M.I.T.

### Industry and Area Development

Moderator: R. Ausrotas, M.I.T.

Subtopics same as under "Community's Need for Air Service"

L. Greene                    Asst. for Aero R&D, DOT

I. Hoover                    Dep. Director, Rocky Mtn. Region, FAA

T. LaPorte                    Assoc. Director, Inst. of Gov't Studies, Univ. of Calif.-Berkeley

F. Weisbrod                City Manager, Pueblo, Colorado

### Local Service Reduction and Commuter Replacement

Moderator: H. Swaine, Consultant to M.I.T. Subissues included the effects of route strengthening, independent commuter replacement, the "Allegheny Commuter" concept, needs of the community, position of ALPA

K. Baldwin                    Chairman of the Board, Air Wisconsin

S. Browne                    Visiting Professor, M.I.T.

K Courtenay Vice President, Economic Regulations, Southern Airways  
 G Green Director, Legal Dept., ALPA  
 R. Henson President, Henson Aviation  
 G Linkon Vice President, Mktg , Frontier Airlines  
 B White Director, Aviation Dept , State of N. Mexico

**Subsidy Issues**

Moderator: W Swan, M I T  
 Discussion included the effects of subsidy on equipment choice, plans for eliminating local service subsidy, route strengthening, certificate deletions, profit sharing between government and carriers, concepts of commuter subsidy (desirability, flow through, bids, operating subsidy), federally funded equipment development, "free" aircraft in lieu of operating subsidy

A Andrews Consultant  
 A Blackburn President, Urban Systems  
 W Kutzke Attorney, General Counsel's Office, DOT  
 J Miller Assoc. Prof., Economics, Texas A&M University  
 T Morton Senior Vice President, Finance, Piedmont Airlines  
 J Pickett Vice President, Air Midwest  
 H Vavra Director, N D Aeronautics Commission  
 W Wayne Vice President, Local Service Mktg., Frontier Airlines

**Finance**

Moderator R Ausrotas, M.I.T  
 Issues included investment criteria, availability of funding, risk analysis, value of route protection or certification to commuters, needed return on investment.

W Hogan Treasurer, Frontier Airlines  
 R Ross Group Vice President, Bank of America  
 J Whitney President, Air New England

**Joint and Through Fares**

Moderator: N. Taneja, M I T  
 Problems of establishing and maintaining joint and through fare programs, filing requirements, publications in tariffs, OAG, in-

termodal effects and policies  
 J Gansle Office of Policy and Plans Development, DOT  
 R Klabzuba Staff, Congressman Moss  
 T Miles President, NATC

**Alternate Service**

Moderator: J Wiley, M.I.T.  
 Subtopics included the use of auto, bus, rail, limousine, relative costs, passenger acceptance.

W Gibbons Regional Dev Planner, Four Corners Regional Commission  
 E Hinz Assoc. Group Dir , Air Transportation, Aerospace Corporation  
 R Montague Manager, Market Research, AMTRAK  
 R Walsh Actg. Director, Office of Policy and Plans Development, DOT

**Environmental Issues**

Moderator W Swan, M I T.  
 Problems included noise and chemical pollution, new engine technology.

C Foster Director, Office of Noise Abatement, DOT  
 J Kramer Director, Refan Prog Of- fice, NASA  
 B Metzger Acoustics & Noise Control, Hamilton Standard Div , United Aircraft  
 A Meyer Dep Asst Admin. for Noise Control Programs, EPA  
 L Williams Aerospace Engineer, Ames Research Center, NASA

**Cargo and Mail Service to Small Communities**

Moderator. N Taneja, M I T  
 Discussion of the problems of providing cargo and mail services to small towns, demand, costs and rates, regulatory problems, loss and damage problems

G Adamson President, Air Midwest  
 R Grammer Exec. Vice President, S-M-B Stage Line  
 P Hwoschinsky Research Asst., M I T  
 L Pierce Vice President, Ross Aviation/President, Great Western Airlines  
 J. St Mark Vice President, NATC



R Shreve                    Manager, Adm., ATA  
 R Soltys                    Director of Marketing,  
                                  Sun Valley Key Airlines

**Limited Certification for Commuter Carriers**

Moderator: A Andrews, Consultant to M I T

Issues discussed were forms of certification, market entry and exit controls, route protection, reporting requirements, costs of regulation.

K Baldwin                    Chairman of the Board,  
                                  Air Wisconsin  
 D Farmer                    Attorney, Dept of Justice  
 J Fugere                    President, Pilgrim Airlines  
 A Horst                    President, Suburban Airlines  
 C Murphy                    Director, Texas Aeronautics Commission

**Airport Requirements**

Moderator: J Vittek, M.I.T

Issues included design alternatives, certification, security requirements and costs, ground access requirements, runway and construction costs, intermodal connections, airline needs

P Haines                    Chief Pilot, Aspen Airways  
 J. Kal                    Airports Planning Division,  
                                  FAA  
 F. Ladwig                    Manager, Peterson Field,  
                                  Colorado Springs  
 M Macy                    Vice President, NATC  
 G. Paulson                    Asst. Dir. of Aviation &  
                                  Airport Mgr., Stapleton  
                                  International Airport,  
                                  Denver  
 W. Rell                    Commander, Airport Security,  
                                  Stapleton International Airport,  
                                  Denver  
 J. Wiley                    Visiting Professor, M.I.T.

**Air Traffic Control**

Moderator: W. Hollister, M I T.

General discussion of requirements for landing aids, navigation aids, tower requirements, safety concerns, equipment cost, performance trade-offs.

G Autry                    President, Rocky Mountain Airways  
 R. Hubbard                    Prog Mgr., Navigation,  
                                  TSC, DOT  
 M Kay                    Assoc. Dept. Head,  
                                  MITRE Corp.  
 W Simpson                    Chief, Air Trans. Syst.  
                                  Proj. Div , DOT

**Operating Costs**

Moderator. W. Swan, M I T.

Issues included DOCs and IOC for regional and commuter carriers, use of small aircraft by regionals, security fees and traffic delay costs, costs of Part 121 operation.

J Adsen                    Chief, Air Transportation Security, FAA  
 B Harris                    Project Manager, Futures, Frontier Airlines  
 G Hickman                    President, Aspen Airways  
 R Klabzuba                    Staff, Congressman Moss Secty. & Treas., Ransome Airlines  
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**Airline Management and Operations**

Moderator: J. Vittek, M.I.T.

Discussion of frequency effects, scheduling, directionality and load factors, management and marketing concepts, employee relations.

J Coker                    Vice President, Marketing, Southwest Airlines  
 K Morse                    President, Command Airways  
 H Voss                    Director, Planning, Golden West Airlines

**Local Service Aircraft Requirements**

Moderator: H. Faulkner, M.I.T.

Technology and performance requirements, unit costs, operation costs, maintenance, subsystem costs, jet appeal, community acceptance.

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 B Harris                    Project Manager, Futures, Frontier Airlines  
 S. Hula                    Director, Marketing Planning, Southern Airways  
 R Kuhlthau                    Professor, Dept. of Aerospace Engineering University of Virginia  
 H. Tinney                    DHC-7 Program Manager, Boeing  
 R. Young                    Sr. Associate, Simat, Helliesen & Eichner

## **Commuter and Air Taxi Aircraft Requirements**

Moderator H Faulkner, M I T  
Same issues as for "Local Service Aircraft Requirements"

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## **APPENDIX C**

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#### **Aircraft Markets and Technology Status**

Moderator R Ausrotas, M I T  
Joint military-civilian developments, import of foreign aircraft and equipment, multi-national development projects, potential domestic sales, present and projected aircraft developments (domestic and foreign), engine technology, systems research

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#### **Safety**

Moderator J Vittek, M I T  
A review of accident causes, technological research, new safety aids, new materials and techniques, improved training and pilot performance monitoring

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