AVIATION

"Industry Working Group"

AIA

Manufacturers

AIR TRANSPORT ASSOCIATION

Airlines

Airports

IATA

Airlines

AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.
AIRPORT OPERATORS COUNCIL INTERNATIONAL, INC.
AIR TRANSPORT ASSOCIATION OF AMERICA
INTERNATIONAL AIR TRANSPORT ASSOCIATION

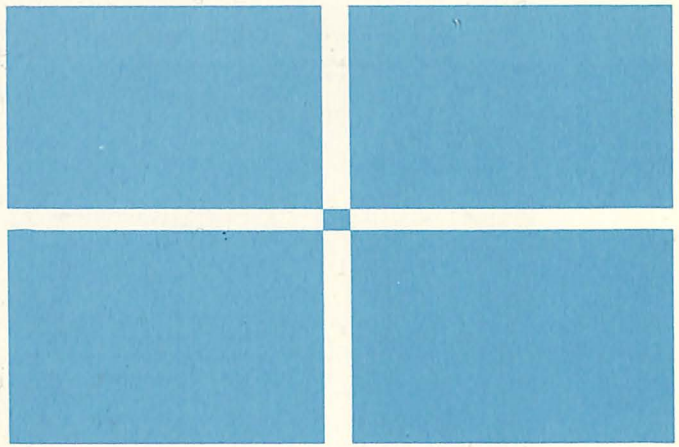
FOR THE IMPROVEMENT OF AIR COMMERCE
THROUGHOUT THE WORLD

A Report on the Activities of the Industry Working Group 1967 to 1970

During the past ten years dynamic growth of the aviation industry has caused the airlines, airports, and manufacturers to make a major effort to keep up with the growth and prevent stagnation. The growth in traffic naturally causes the airlines to procure additional equipment. It causes airports to expand their facilities and develop new airports and results in the manufacturers developing totally new concepts in air transportation, such as the Boeing 747, the Lockheed L-1011, and the Douglas DC-10 wide-bodied high capacity aircraft. Prior to introduction of new types of aircraft, government regulations have been implemented to limit the number of aircraft operating at some major airports in the United States.

The growing crisis confronting the industry has been recognized by individual segments of industry for some years, but it was not until 1967 that action was initiated organizing combined effort to assist in the resolution of the problems. In March 1967, an Industry Working Group was formed composed of the Aerospace Industries Association of America (AIA), the Air Transport Association of America (ATA), the Airport Operators Council International (AOCI), and the International Air Transport Association (IATA).

This report describes the formation of this group, its purposes, plans, objectives, and significant accomplishments for improvement of the aviation industry. These have proven to be of great value to all phases of the aviation industry domestically, and internationally.



Passenger Traffic Forecast

U.S. DOMESTIC TRUNK TRAFFIC

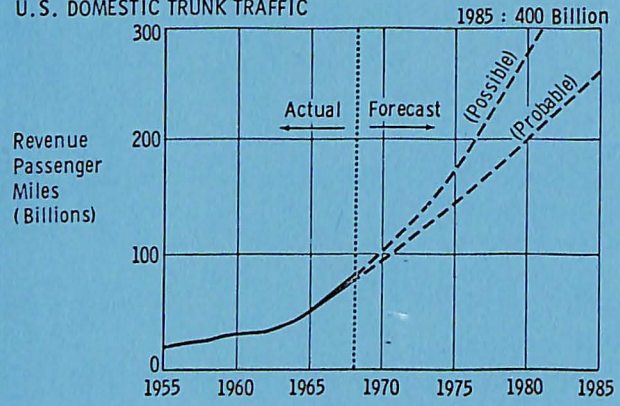


FIGURE 1

Gross Estimates of Funds Required

AIR TRANSPORTATION FACILITIES

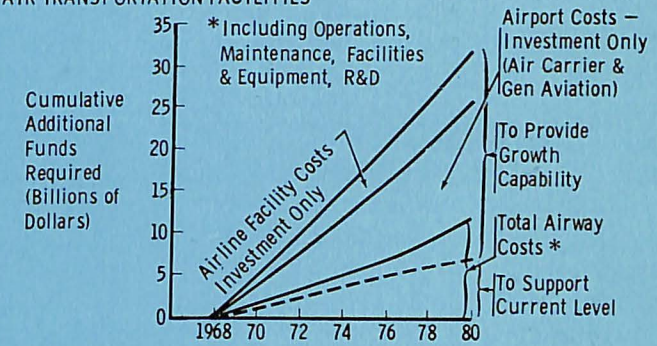


FIGURE 2

Revenue Passenger Mile Forecast

U. S. DOMESTIC TRUNKS
U. S. LOCAL SERVICE

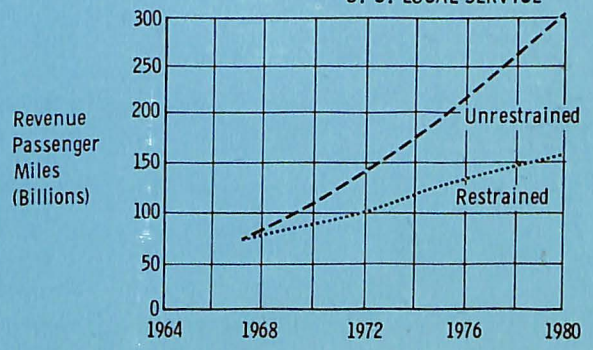


FIGURE 3

Background

The industry is trying to cope with problems associated with rapid growth and at the same time make necessary preparations to accommodate the ever-increasing demands of the future. Part of the industry's problem today is caused by travel demands which exceed the industry's capabilities, resulting in inadequate airport and airway systems.

Forecast

The actual passenger traffic of the United States domestic trunk carriers and the forecast for the time period to 1985 are shown in Figure 1, and are typical of those being used in industry today. The "possible" curve of the forecast represents an unrestrained demand which could exist with sufficient supporting services and facilities. This curve is based on projections of the Gross National Product (GNP) and other relevant demand indicators. The "probable" curve represents the anticipated effects of a restrained environment. An example of such a restriction would be the existing limitations on operations at five major United States airports. This measure severely cuts back the rate of traffic growth and restricts growth capability. These restrictions are likely to continue until the capacity at these locations can be increased to accept current demand and future growth.

The difference between the two curves does not appear to be large; however, calculations show that an accumulative dollar loss in gross income to the airlines would approximate 25 billion dollars between 1970 and 1980. This is just one example of the impact that restrictions would have on one segment of the economy.

To realize the growth potential, it is necessary to pinpoint the deficiencies in the air transportation system and concentrate our effort, time, and money in this direction. Since a large amount of money will be required, the emphasis should be in resolving those problems which have the greatest influence on the growth of air commerce. This action will determine whether the probable curve will be higher or lower.

Costs and Economic Impact

Studies have been made to estimate the total funds required to remove major constraints and permit an unrestricted growth of the aviation industry. Figure 2 shows the gross estimates of funds required for air transportation facilities. Exclusive of the direct airline costs shown as the top band on the graph, 25 billion dollars would be required through 1980 for airways and airports. If the airlines' cash outlay for ground facilities is added this figure could exceed 30 billion dollars. Some of these dollar amounts could even be conservative, particularly for airport costs. To see whether such expenditures are justified it is necessary to examine the benefits that would be gained from these expenditures. It is equally important to examine economic impacts experienced by the community and the air transportation industry if these constraints are not removed.

In estimating the impact of restrained traffic growth on the United States economy the forecasts shown in Figure 3 were used as a point of departure. The restrained demand is based on the assumption that there is no growth in air carrier operations. The increase in passenger miles is a result of introduction of larger aircraft into service and from changes in airline route structure.

The air traveler contributes substantially to the economy of the area to which he travels in terms of expenditures for food, lodging, transportation, and services. Airport income also is derived from passenger expenditures at concessions as well as from landing fees paid by the airlines. In Figure 4, we show on the ordinate the annual loss to local communities through reduced traveler expenditures and airline landing fees resulting from the constrained growth. This could amount to an accumulative loss of approximately 32 billion dollars.

The effect of restrained growth on personal disposable income is even greater amounting to 71 billion dollars over the same time span as shown in Figure 5. Not only is employment in the air transport industry affected, but also that of suppliers to the industry. The reduction in personal disposable income is reflected in reduced expenditures for consumer goods and employment in the consumer goods industry.

Figure 6 indicates that all levels of government suffer a corresponding loss of income, accumulating to 31 billion dollars for the three segments identified in Figure 5. This amount, equal to about 30 times the total Federal Aid to Airports appropriations in the period 1946 to 1967, includes the reduction in incomes to local, state, and national governments from taxes collected from companies and persons engaged in or supporting the air transportation industry. The accumulated loss in airline gross income corresponding to the forecasts shown in Figure 3 amounts to 42 billion dollars over the time span 1968 to 1980, Figure 7. The annual loss by 1980 would approximate 1-1/2 times the total United States Trunk and Local service revenue in 1967.

The interest of aircraft manufacturers in constraint alleviation is underscored by a corresponding cumulative impact of 13 billion dollars, Figure 8.

A direct summation of the economic impacts is not possible since those given for one segment of the industry may be included in those shown for another segment. However, the data shown in Figures 4, 5 and 6 is mutually exclusive resulting in an accumulative impact over the next ten years of approximately 130 billion dollars. In comparison, the estimate of funds (Figure 2) shows approximately 30 billion dollars required to relieve the constraints thereby resulting in an uninhibited growth of the air transportation industry. If such funds could be properly utilized to remove restraints the potential economic gain to the national economy would be the accumulation of these two figures or at least 160 billion dollars in the next ten years.

The United States Congress has recently enacted trust fund legislation to assist in financing airways and airport development programs. It will require a combination of corrective and innovative measures to insure proper application of these funds in essential areas to prevent a severe slowdown of air commerce growth and the economic penalties just discussed.

To obtain the utmost benefits from airports, local governments should provide better incentives to assure integration of their plans with those of the region. Of prime importance is the necessity to carefully plan and control the use of land near airports in order to ensure both adequate expansion capabilities for the airport and compatible land use in that area. These steps would make it possible for the airport to be a better neighbor. The Federal Government's role in overcoming air commerce deficiencies

Economic Impact of Restrained Demand

SEGMENTS OF THE LOCAL ECONOMY

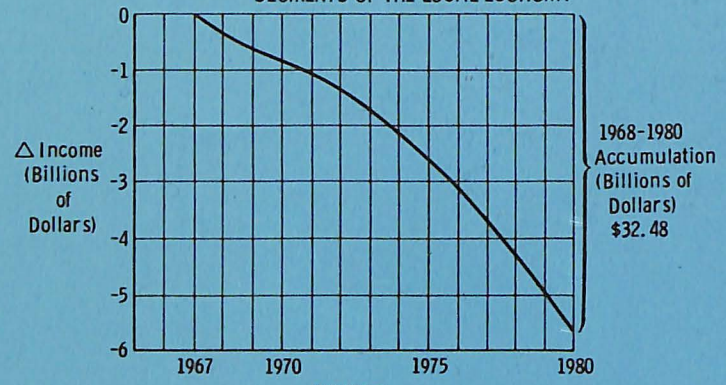


FIGURE 4

Economic Impact of Restrained Demand

ON PERSONAL DISPOSABLE INCOME

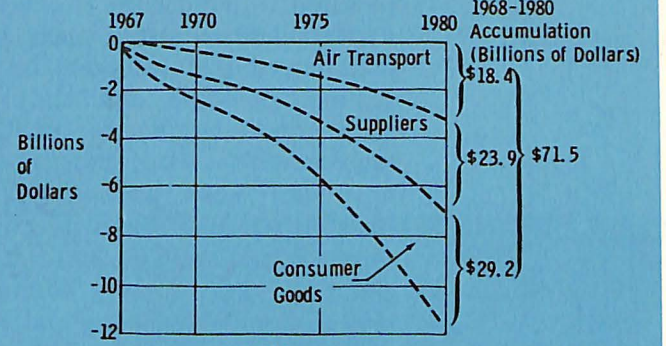


FIGURE 5

Economic Impact of Restrained Demand

ON GOVERNMENT INCOME

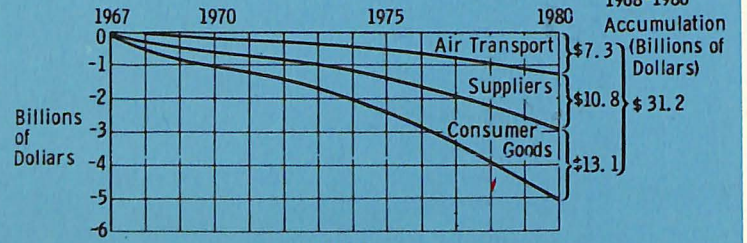


FIGURE 6

Economic Impact of Restrained Demand

ON AIRLINE REVENUE

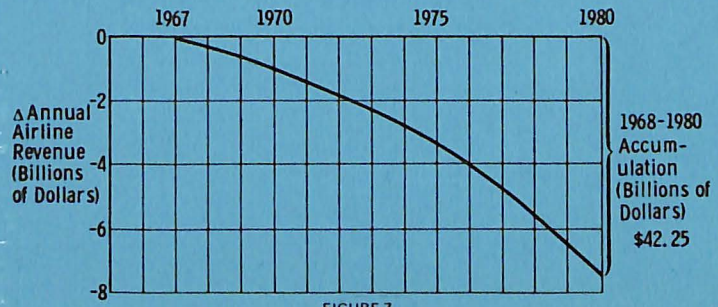


FIGURE 7

lies principally in the long range development of an air traffic control system which would help provide the capacity required to handle the expected demand with the highest safety levels. Long range planning should integrate both air and ground elements and should provide adequate standards to identify future requirements. Also, existing standards have not kept pace with advancing technology and must be updated. Finally, the airways and airports program must be properly administered to insure adequate capacity and compliance with timely schedules, thus ensuring optimum service.

It is with this background that the various segments of industry have combined their efforts to develop the tools necessary for the timely growth of the air transportation industry.

Economic Impact of Restrained Demand
ON AIRCRAFT MANUFACTURERS

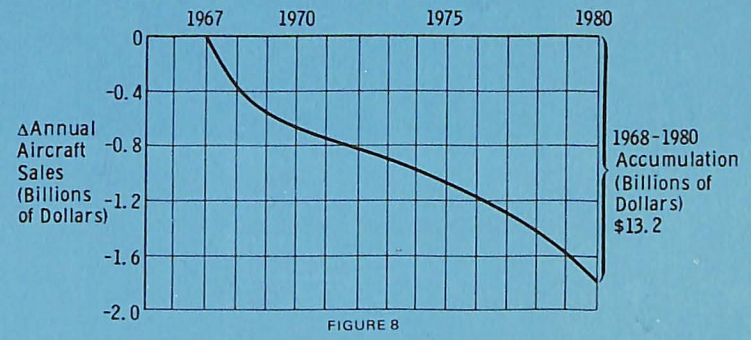


FIGURE 8

Industry Working Group Formulation

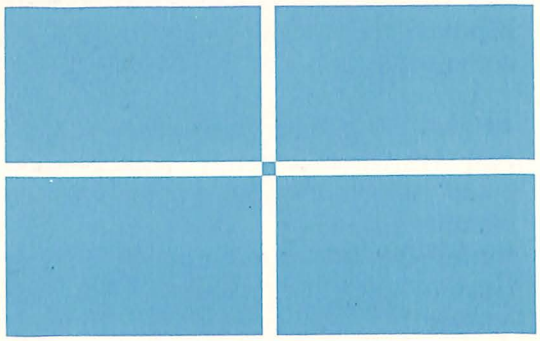
In September 1966, The Boeing Company initiated a series of meetings to assist in the introduction into airline service of advanced aircraft such as the 747. The industry cooperation exhibited during these meetings suggested a continuation, in an informal way, of work on problems affecting the future of air commerce. As a result, a meeting was held in March 1967 to identify a nucleus of people in industry who had resources available that could be committed to projects of industry importance with good expectations of tangible outputs. Attendees at this first meeting of the Industry Working Group included airport operations (represented by the AOCI), airlines (ATA and IATA), and aircraft manufacturers (AIA).

Although this first group meeting was rather large it was clearly evident that this type of group was essential and should be continued, but of a smaller size which would be more effective and less unwieldy. It was agreed that the Industry Working Group would continue to be principally composed of representatives of the airports, airlines, and airframe manufacturers. As the occasion demanded, participation from government agencies would be solicited.

Objectives

The objective of the Working Group is to improve the quality of planning and coordination of airports and their related transportation interfaces through activities designed to:

- Promote and continue an exchange of technical information among airlines, airports and transport aircraft manufacturers to assist in the solution of the airport problem.
- Provide the machinery for establishing and presenting a unified industry position, where necessary, in the promotion of its efforts to solve the airport problem.



Organization

The Industry Working Group as initially constituted in 1967 was organized along the lines shown in Figure 9. The intent was to be flexible and informally organized. Policy guidance has from the beginning come from the highest level of the participating associations as indicated on this chart. A recording secretary belonging to one of the associations handles the necessary coordination and communications.

At this meeting it was recognized that the transport aircraft manufacturers could not be represented by only one member of the AIA organization and a forum for the manufacturers deliberation would be required. The AIA reorganized and created the Transport Aircraft Council which currently handles coordination among aircraft and power plant manufacturers. The organization chart shown in Figure 10 reflects the additional AIA representation in the Industry Working Group. Appendix A is a breakdown of the various organizations attending the meeting and gives the classification of all participants.

Plans and Procedures

At the initial meeting for development of the industry Working Group and the definition of objectives three major task areas were defined. These areas were considered to be of prime importance and needed immediate attention. First, forecasts of reliable quality and detail unachieved earlier are essential for airport planning. The second activity, system capacity, has as its goal the estimation of future system capacity that would result from implementation of existing plans. A comparison with forecast demand would reveal the existence of any future capacity deficiencies. A third activity was the need for good reliable information on current characteristics of the airplanes in service, and those definitely committed to production. Aircraft characteristics are important ingredients in effective airport planning. Figure 11 outlines these three major areas defining their specific elements, the expected output, and the end use. At the outset it was recognized that the initial tasks were formidable in nature and would require a considerable amount of effort by more people than the individual Working Group members. It was expected that the additional support would come from other departments in each of the participating organizations. Because of the urgent nature of these tasks, it was agreed that meetings would be held approximately every 60 days to review the progress of the activities during that period of time.

Meeting sites are selected on the basis of providing an opportunity for participants to broaden their knowledge of aviation industry problems and to promote a dialogue with people of aviation interests in that locality. Appendix B is a list of the meeting locations. The following section deals with the various tasks and accomplishments of the Industry Working Group. It may be noted that several additional tasks have been undertaken by the Working Group as follow-on projects after the initial tasks were completed.

Industry Working Group Organization - 1967

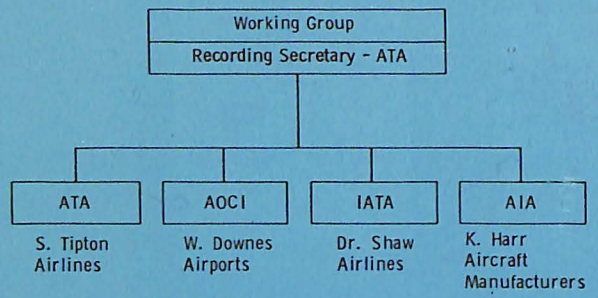


FIGURE 9

Industry Working Group Organization

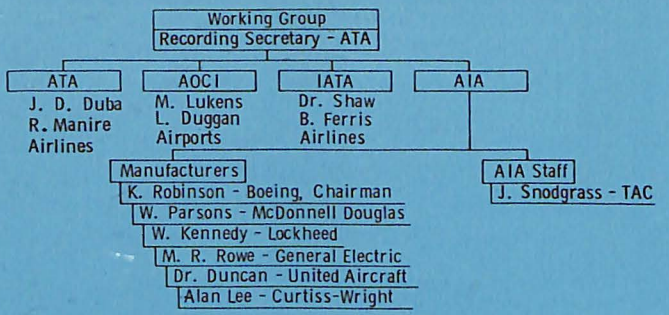


FIGURE 10

Objectives

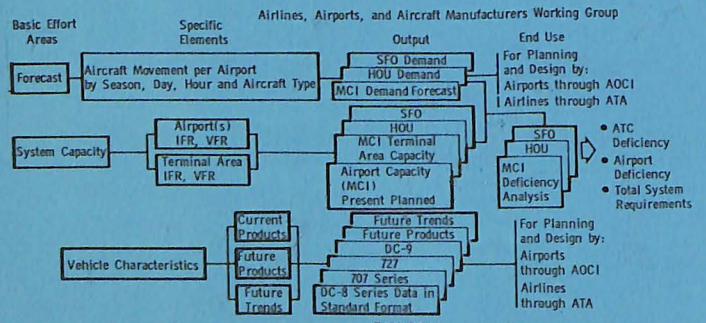
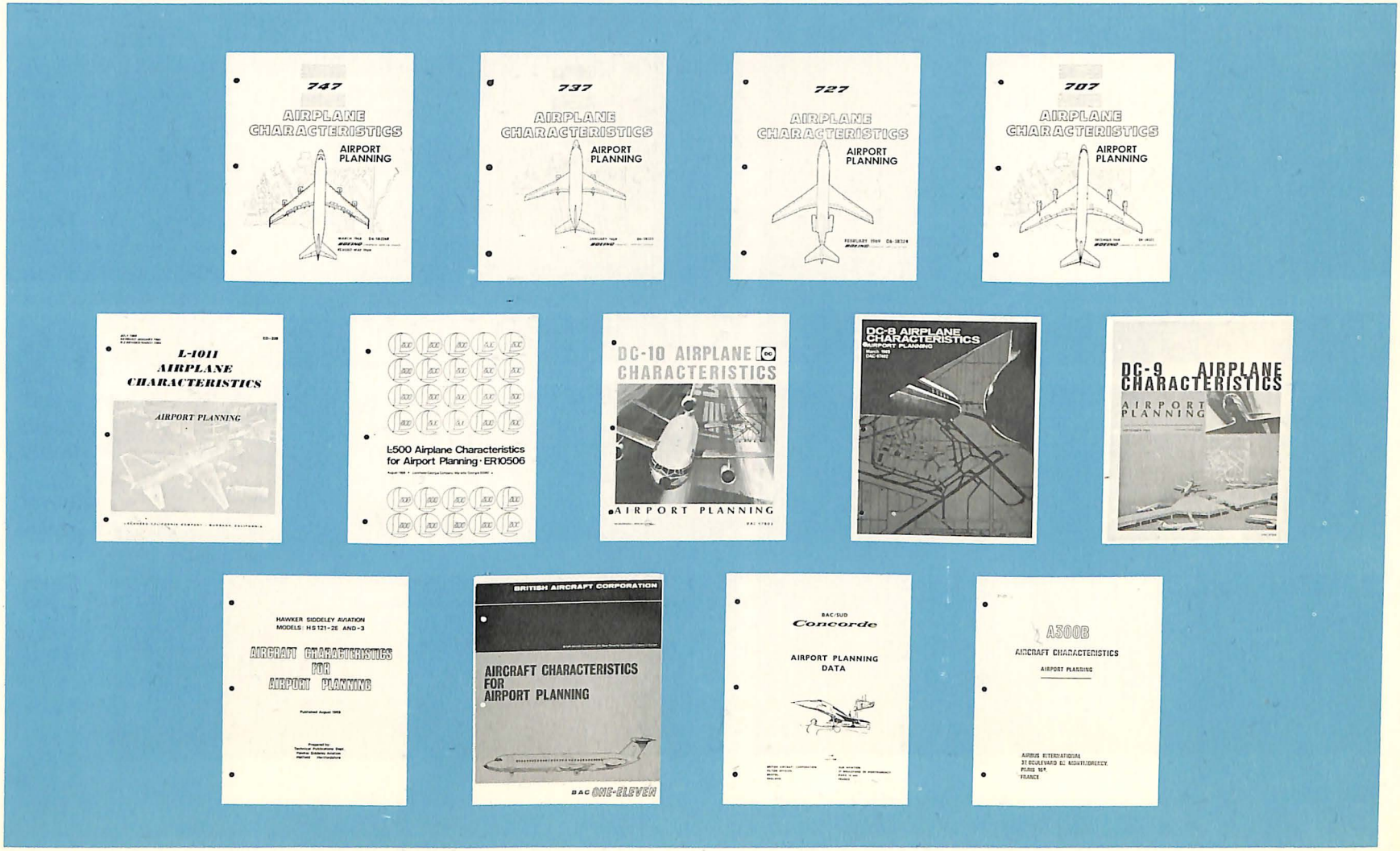


FIGURE 11

FIGURE 12

Vehicle Characteristics

CURRENT AND FUTURE PRODUCT DOCUMENTS



Tasks and Accomplishments

The following section defines the various major tasks undertaken by the Industry Working Group and the products developed which are playing important roles in the removal of aviation constraints.

Airplane Characteristics for Airport Planning

One of the early results of the Working Group Meetings was the agreement that a standard format was needed to report aircraft characteristics specifically for airport planners. It was agreed that the quality of airport planning could be enhanced if the manufacturers reported uniformly the information needed. In the past, the manufacturers had provided information, but according to different formats, even for a given manufacturer. Accordingly, the first task addressed by the Working Group dealt with providing airport planners appropriate air vehicle characteristics documentation.

It was determined that a need existed for three types of documents. First, there is a need for information that applies to the vehicles in operation today. The airports served by these vehicles generally have the information they need. However, as the transportation fleet expands, these airplanes will be used at many other airports; which will need adequate data to prepare for these airplanes. Second, documentation is needed on future products, i.e., aircraft now committed to production but not yet in service. Third, a trend analysis of aircraft beyond those firmly committed to production or in service is required to support long term aircraft planning.

The Working Group agreed that the documentation for current and future products would follow one standardized format and would be published and distributed by the individual manufacturers. This format, developed with full participation of the airlines and airports, was published as National Aerospace Standard No. 3601 for United States domestic use in June 1968. This method provides for custodianship of the format, encourages uniformity in compliance, and provides an accepted method for taking up and adopting revisions. IATA received a copyright release of this Standard for international use. Most current aircraft have now been documented according to this format and very wide distribution has taken place. For example, almost 4000 copies of the documentation for the Boeing 747 have been distributed. Total cost to the manufacturers to date has been estimated in the neighborhood of one million dollars. The format was revised in the spring of 1969 to reflect experience gained.

It is significant to note that the issuance of the National Aerospace Standard in June of 1968 was approximately one year from the initial establishment of the Industry Working Group and the acceptance of this task as an assignment. It is also significant to note that documents to this format were being issued almost at the same time that the National Aerospace Standard was finally released. By the end of 1968 separate documents had been issued on almost all current United States produced aircraft in operation. Figure 12 shows the documents that have been available for quite some time for industry use in airport planning. It should be noted that international acceptance of this standard has been evidenced by the issuance of the characteristics document on the Concorde, A300, and Trident. Other European airframe manufacturers are also preparing documents on their vehicles to this format.

Future Trends Document

The need for a Future Trends Document was identified as a part of the initial task of defining vehicle characteristics not only for current products, but also future products.

The Future Trends Document gives the industry's best estimates of what may lie ahead in aircraft design for subsonic and supersonic aircraft. Special consideration is given to multiple deck aircraft and to cargo aircraft including periods of introduction. The first edition of this document was published in the Spring of 1969 and revised in April 1970. It is anticipated that this document will be updated at regular intervals, perhaps yearly. Since this document is distributed to the recipients of the other Vehicle Characteristics documents, its distribution also is widespread. The Vehicle Characteristics documentation has demonstrated how the manufacturers, resolving some technical differences, can work together with the airlines and the airport operators to come up with a useful product.

It has also been considered necessary to provide a similar document of Future Trends related to STOL vehicles. Figure 13 depicts the conventional takeoff and landing (CTOL) Future Trends Document and a time schedule for its preparation. The time schedule is also shown for the STOL Future Trends document.

Forecasts

The second area which received the attention of the Working Group dealt with traffic forecasting. It was recognized that the industry as a whole needed unified forecasts of future traffic so that planning could proceed on a common basis. The forecasting done by each airline naturally concentrated on the prospects and aims of that particular airline. Early in 1966 United Air Lines started a very ambitious program to forecast the needs at all of the major airports it served. This Master Plan effort was eventually continued under the auspices of the ATA with the support of other airlines. The Master Plans were based on available traffic forecasts and pinpointed their critical importance to the industry as a whole.

In June 1967, the Working Group compiled a composite of all forecasts of United States domestic trunk traffic with all available sources considered. As expected there were substantial differences in the forecasts. The high forecast for 1980 was 50 percent higher than the low forecast for that time. It thus became clear that industry consensus was required in order to provide a common basis for coordination of airport requirements planning. Figure 14 shows the composite forecast made in June 1967 for the United States domestic trunk traffic. Each forecast is identified as to source and shows the variations.

Subsequent to the June 1967 meeting the airlines assembled a forecasting task force involving about 40 of their key planning people. They received some support from other portions of the industry in this task. It is a significant achievement that an agreed-upon methodology was derived. In 1968, the macro-forecast was completed and the methodology applied to five large hubs. These forecasts were released in late 1969. The ATA is continuing its forecasting activity, with a plan for completion of all large hubs some time in 1970, and this will constitute a major landmark in large hub planning. Figure 15 shows the progress of this activity. Another major landmark was established

Future Vehicle Characteristics

Future Trend Document - CTOL
- Publication by AIA
- First Draft Reviewed September 1968
- Final Review March 1969
- Published March 1969
- Revised April 1970

Future Trend Document - STOL
- Task Force Formation May 1969
- First Draft - Summer 1970

FIGURE 13

Composite Forecast - June 1967

U.S. DOMESTIC TRUNK TRAFFIC

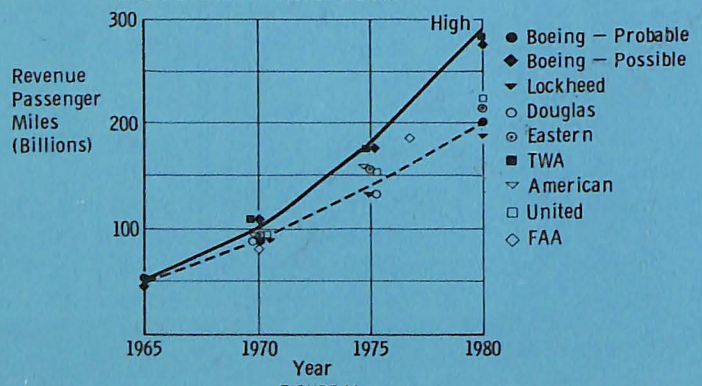


FIGURE 14

U.S. Domestic Forecast

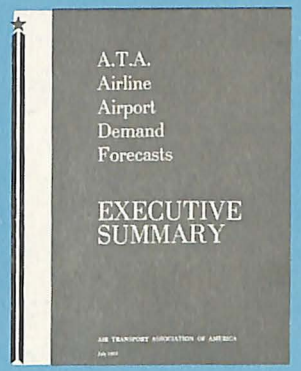
FIGURE 15

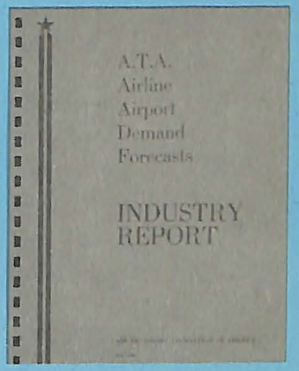
July 1969
- Airline Task Force
- Methodology Completed
- Macroforecast Published
- First Five-Hub Movement and Fleet Mix

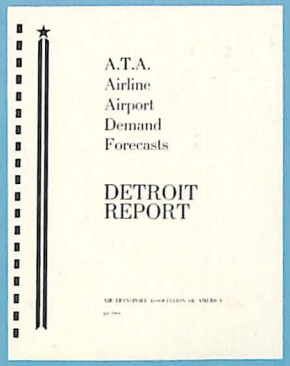
Passenger and Cargo Final Published

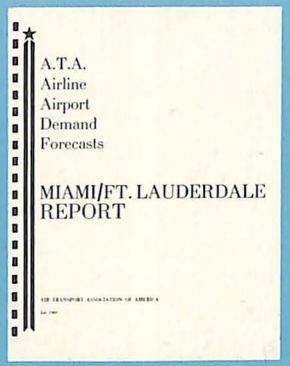
Atlanta
Detroit
Miami
Philadelphia
Seattle

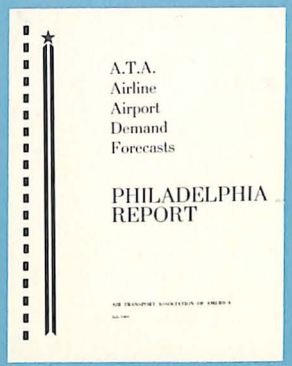
1969 ● Additional 17 Cargo Hubs in Progress

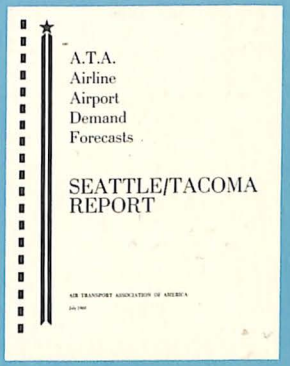












in August 1967 by the FAA when it issued its report, Aviation Demands and Airport Facility Requirement Forecast for Large Air Transportation Hubs Through 1980. This work has since been followed by a similar study dealing with the medium hubs.

At the same time, a team from IATA began an attempt to forecast international traffic. The availability of data is a problem since many of the foreign airlines are state-owned. There appears to be a reluctance or inability to forecast beyond a five-year time span. Pilot forecasts using the hub approach were initiated for Sydney, Rio de Janeiro and Lisbon; later, Bermuda was added. If the proper cooperative climate develops, and the existing data base proves sufficient, this pilot study will be expanded.

Airport Data

To serve the extremely rapid growth in demand for air travel, the manufacturers must design more and more expensive aircraft. The decisions to commit to the production of these higher risk ventures require a comprehensive understanding of the full operating environment of the airplane and its ability to accommodate the new design.

Airplane/airport compatibility is one of the prime factors that facilitate the introduction of new models into the existing air fleets. The achievement of this goal is a two-way street. Just as airport planners need information on present and future aircraft, so the aircraft designer needs, in considerable detail, the present characteristics of airports and plans for expansion. It can even be said that, in some important respects, airports design airplanes. In keeping with this realization, the Working Group added to its basic areas of effort the collection of airport data.

Initially, the manufacturers undertook to provide tentative drafts for an airport data format that would be used to collect the required information. These inputs were consolidated into four sections, reviewed by the Working Group, and underwent a considerable development period portrayed in Figure 16. This project turned out to be much more difficult than documenting airplane characteristics.

After many reviews, revisions, and two field trials held at St. Louis, further revisions of the format were felt to be

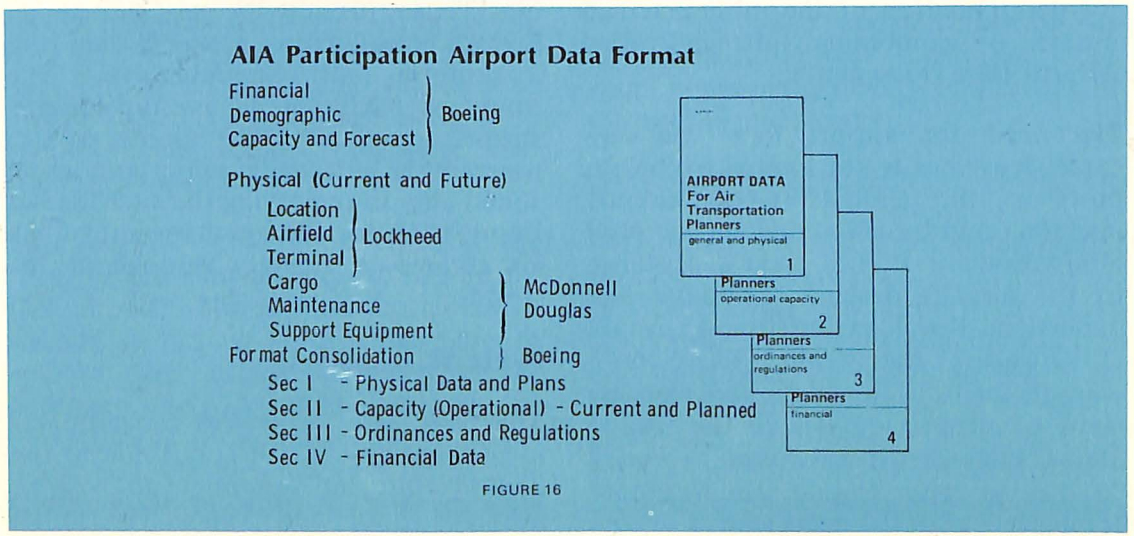


FIGURE 16

desirable. Special attention was paid to the availability of the information from the FAA and from ESSA. In the latter part of 1969 the airport data format was approved by the Working Group for extensive field trials in which it would be sent out by the AOCI, first to the large hub airports and later to the medium hub airports.

In January 1970 a request was sent to 27 United States major airports for completion of the airport data package according to the format developed. Some of this information has been received and is currently being reviewed for determination of the most practical means of combining into individual Airport Data Documents.

The need for airport data and any expansion plans is not limited to the airports of the United States. Aircraft manufactured by all companies are used internationally. It is of great importance to the aircraft designer to know and understand the characteristics of airports throughout the world. There is a considerable difference in the management of airports outside of the United States, therefore, it was found necessary to revise the format to be more compatible with the management organization of international airports. The International Air Transport Association (IATA) is currently reviewing the format to assure that its contents conform to available data internationally.

While the airport data format appears to require considerable detail, it is important that airplane designers, airline planners and programmers have complete knowledge and understanding of all aspects of the airport to provide a sound basis for their planning. Additionally, much of the data is currently available at the airports in various reports, documents, publications, files, etc. Thus, this activity may principally involve consolidating available data into a uniform and comprehensive single source to facilitate its use outside the airport community. The success of this program is extremely important as an added step in improving the exchange of information for the improvement of the air commerce industry throughout the world.

System Capacity

The basic task of system capacity was identified early in 1967, but due to the unavailability of resources no activity occurred until mid 1968. The initial activity plans were held in abeyance with the establishment of the Department of Transportation Air Traffic Control Advisory Committee to identify the broad future of the United States Air Traffic Control System. Many individual companies undertook to support this committee with their own individual resources. Such lists of organizations go far beyond those involved directly in the Industry Working Group activity. Figure 17 identifies some of the companies and organizations contributing to this activity.

The activities of the Air Traffic Control Advisory Committee have been completed and reports have been written, published and are available through the United States Department of Transportation.

Participating Organizations

ATA	Lockheed
AOCI	McDonnell Douglas
Autonetics	Mitre
Bendix	NAFEC
Boeing	Quantronix
Control Data	Singer-GPL
DOT	Texas Instruments
FAA	Univac
IBM	USAF
IDA	

FIGURE 17

NEW TASKS

New and significant problem areas are brought to the attention of the Industry Working Group for consideration. These projects are reviewed and if they are within the scope and capabilities of the Working Group and will contribute beneficially to the aviation industry, the tasks are assigned and work begun.

Pavement Strength Evaluation

One project currently under investigation to determine the feasibility of the Working Group's sponsorship would result in full scale testing of existing airport pavements with current operating aircraft. This study would result in obtaining actual data from the tests to verify current methodology being used to determine airport pavement load carrying capabilities.

This program would require, through the AOCI, active participation of four major U.S. airports. The airlines would provide aircraft of varying types and weights to operate over instrumented sections of pavement, the AIA would coordinate the development of instrumentation procedures and the analysis of data and its relationship to current methodology. This project is considered important to the development of a universally accepted methodology of pavement strength determination.

Indirect Operating Cost Formulas

A segment of the Industry Working Group is currently studying the previously developed methods of determining Indirect Operating Costs. Methods currently in use were established many years ago, and it was deemed necessary to re-evaluate these methods in view of the changes that have taken place in the aviation industry. It is felt that a new and updated method for determining Indirect Operating Costs could improve the quality of planning by the airlines and airports.

FAA Advisory Circular Program

With the advent of the new generation of aircraft, major expansion is taking place at airports and new airports are being developed. These improvements and new designs should be based on the latest state-of-the-art. Guidance is generally provided for airport planning and development through the FAA Advisory Circular system, especially if Federal

funding is involved. It has been difficult for the FAA to maintain the Advisory Circulars in an updated status, and due to changes in technology, new guidance for airport development is required. The current Advisory Circular system, although providing a considerable amount of information, has created problems in ensuring that the consideration is given to all criteria affecting airport development. Because of the broad range of subjects and interrelationship of Advisory Circulars, the Industry Working Group initiated a preliminary review of the Advisory Circulars to evaluate their interrelationship in the form of a matrix. These activities have been coordinated with the FAA, and in recent meetings a program was established to provide a cross-reference index by subject matter of the entire Advisory Circular system, including Notices and Orders. The indexing is currently being accomplished by members of the Industry Working Group. The master index will then be compiled by the FAA. This will provide assistance in airport planning by providing an immediate reference source for all pertinent information regarding a particular subject. The index will also serve as a guide for the possible improvements of the Advisory Circular system by combining all significant items on a particular subject into one primary document. It is expected that this index will be completed in the fall of 1970.

International Aviation Associations

When the Industry Working Group was initially established it was not intended to be only a United States domestically or United States oriented organization; thus the participation by the International Air Transport Association (IATA). It is obvious the products of the Industry Working Group have been used world-wide, such as the Airplane Characteristics documents, Trends documents, and the forthcoming Airport Data development. The European airframe manufacturers are currently developing Airplane Characteristics documents in accordance with the United States developed format. Practically every major airport, architect, planning council and engineering company throughout the world, have received copies of the United States manufacturers Airplane Characteristics documents and the Future Trends document.

Because of the nature of the aviation industry and international air travel, the boundaries cannot be defined as they may be in some other forms of transportation. There are, however, certain geographical considerations which limit the close association of other world organizations with the Industry Working Group. Because of the successful operation of the Industry Working Group similar international organizations in other geographical areas are being encouraged. It is hoped that a close working relationship will be established between these groups.

Summary

The initial objective of the Working Group, to improve quality of planning and coordination of airports with their related transportation interfaces, is unique in nature and in no way conflicts with or duplicates important activities by other organizations such as the SAE (Society of Automotive Engineers), ASCE (American Society of Civil Engineers), or the host of other technical organizations. This Working Group has opened up entirely new avenues of communication in the aviation industry. The products developed through its efforts have provided valuable tools for the entire aviation industry.

It is important that the activities of this group be continued and expanded for the improvement of air transportation throughout the world.

Appendix A

TYPICAL LIST OF
INDUSTRY WORKING GROUP MEETING ATTENDEES

NAME	TITLE	ORGANIZATION
AIA		
K. G. Robinson	Director Air Commerce Restraint	Boeing
R. A. Strandberg	Chief–Airport Studies	Boeing
W. P. Ericksen	Group Engineer–Airport Compatibility	Lockheed-Calif. Co.
W. P. Kennedy	Director Commercial Aircraft Analysis	Lockheed Aircraft Corp.
J. H. Burnett	L-500 Support System/Facilities	Lockheed-Georgia Co.
W. E. Parsons	Manager Airport/Aircraft Compatibility	Douglas
J. K. Moore	Staff Technical Specialist	Mc Donnell
Joe Snodgrass	Director Transport Aircraft Council	AIA
R. L. Duncan	Manager Advanced Planning	Pratt & Whitney Aircraft
H. C. Kindle	Manager Industry Requirements	General Electric
ATA		
J. D. Duba	Vice President–Airport Facilities	ATA
R. W. Manire	Director Airport Planning	ATA
R. J. Sutherland	Director Airport Planning	American Airlines
K. R. Whitehead	Director Facilities & Airport Planning	United Air Lines
R. F. Birk	Manager Airfield Planning	Eastern Airlines
J. Hume	Manager Airfield & Ground Equipment Planning	Delta Airlines
IATA		
Dr. R. R. Shaw	Technical Director	IATA
R. Boyd Ferris	Director Engineering & Maintenance	IATA
AOCI		
Leo Duggan	Vice-President–Technical Affairs	AOCI
Jack Downey	Director of Planning	Dallas/Ft. Worth Regional Airport
W. E. Downes	Commissioner of Aviation	Chicago, Ill
T. M. Sullivan	Executive Director	Dallas/Ft. Worth Regional Airport
Louis Achitoff	Chief-Aviation Technical Service Division	Port of New York Authority
FAA		
Max Bard	Chief-Standards Division	FAA-Airports Service
Bob Endres	Chief-Design Standards Branch	FAA-Airports Service

Appendix B

INDUSTRY WORKING GROUP
MEETINGS

LOCATION	DATE
Washington, D.C.	3-67
Washington, D.C.	5-67
Washington, D.C.	6-67
Washington, D.C.	7-67
El Paso, Texas	5-68
Montreal, Canada	9-68
Dallas, Texas	11-68
Boston, Massachusetts	1-69
Las Vegas, Nevada	3-69
Atlanta, Georgia	5-69
Seattle, Washington	7-69
Scottsdale, Arizona	10-69
New Orleans, Lousiana	1-70
San Francisco, California	4-70
New York City, New York	6-70